Pikes Peak Regional Communications Network

C-Zone Operational Procedures Manual

May 5, 2011

Revised

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Foreword

The Pikes Peak Regional Communications Network provides users within El Paso County, and to some degree our neighboring counties, with the ability for every PPRCN user radio to be employed in multi-jurisdictional or interagency incidents or events. It is done through a common set of interagency talkgroups that are readily found in certain switch positions of each radio - i.e., the C-Zone switch positions.

This allows enormous flexibility in handling several simultaneous interagency events while employing PPRCN radios. The only special need is user knowledge and discipline.

The primary method for either requesting C-Zone talkgroup access for a new event, or for finding out which talkgroup is currently in use for an existing interagency event, is to contact dispatchers at the El Paso County Sheriff's Office, (radio switch position C1), City of Colorado Springs Fire Dispatch, (radio switch position C16), or Colorado Springs Utilities Dispatch, (switch position C15). Users should be able to join incident command or operations radio communications for any interagency event employing the interagency talkgroups.

Each radio in the PPRCN network is, by PPRCN policy, programmed with eleven common digital trunked network talkgroups and five international conventional radio resources -- sixteen switch positions in all -- placed in Zone C. This configuration is required by policy to be in the same toggle and rotary selector switch positions in every HT radio, and in Zone C of each mobile radio used on the system. When the toggle switch or Radio Zone is set to the "C" position/zone, the radio can operate on these common PPRCN network resources.

At its regular March 7, 2007 meeting, the PPRCN Agency Board adopted a revised policy to the previously titled "C-Switch Policy", adopted in 2001. It is now called the C-Zone policy.

The procedures within this manual have been created to provide the foundation for universal, efficient operation on the C-Zone talkgroups.

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C-Zone Operational Procedures

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REVISION HISTORY

Date	Chapter	Title	Number	Change Description
8/21/08	400	C-Zone Talkgroup Resource and Event Management	I.B. (5th Bullet)	Clarified problems associated with monitoring busy talkgroups through remote sites.
8/21/08	430	C-Zone Radio Procedures	Various	1) Added clarification concerning the 8CALL and 8TAC channels. 2) Added paragraph VII on aircraft operations.
8/21/08	900	System Outage	V.B.	Removed reference to ICALL channel.
8/21/08	1000	Terms and Definitions	Various	Numerous additions and reordering of the definitions.
4/21/11	300	Chapter III - C-Zone Talkgroup Access Protocols	Various	Update, Clarification
4/21/11	430	Chapter IV - C-Zone Talkgroup Resource and Event Management	Various	Update, Clarification
5/5/11	300	Chapter III - C-Zone Talkgroup Access Protocols	Various	Grammatical and uniformity changes requested by PPRCN Board member
5/5/11	430	Chapter IV - C-Zone Talkgroup Resource and Event Management	Various	Update, grammatical and uniformity changes requested by PPRCN Board member

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Effective Date: 9/20/07 Supersedes:	Approval:		Number: 100
Subject: Introduction			
Reference: PPRCN Policy and Procedures Manual, PPRCN IGA			
Chapter I - Introduction		Reevaluation Date:	No. Pages: 1

Purpose: The Pikes Peak Regional Communications Network (PPRCN) Users Council has developed the procedures in this document to ensure efficient and effective use of common PPRCN radio communications system resources.

This document is intended to standardize the way the PPRCN system is used during the response to, and mitigation of, an interagency or multi-discipline incident. It is not intended to mandate or require users to implement specific intra-agency procedures; however, it does detail specific interactions and protocols with those dispatchers who are managing the interagency talkgroup resources. The Users Council hopes all agencies will be able to perform daily operations, using the C-Zone resources, in the same manner that they would be operated during a major event.

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Effective Date: 9/20/07 Supersedes:	Approval:	Number: 200
Subject: Members		
Reference: PPRCN IGA, Dated December 1, 1999		
Chapter II - Members	Reevaluation Date:	No. Pages: 1

Purpose: To describe by definition, titles and types of memberships within the Pikes Peak Regional Communications Network (PPRCN).

Definitions:

- **PPRCN** - Pikes Peak Regional Communications Network (PPRCN) is an agency created by an Intergovernmental Agreement between the City of Colorado Springs and El Paso County, dated for reference December 1, 1999. The PPRCN IGA was created to establish an organization to manage a trunked radio system for the stated members.

- **IGA** - An Intergovernmental Agreement (IGA) is an agreement between two or more governmental entities.

- **Members** - In accordance with paragraph 3.2 of the PPRCN IGA, "The PPRCN shall be comprised of two Members: the City of Colorado Springs and the County of El Paso, including all Units, Enterprises, Departments and Offices that are funded and operated by these governmental entities, except as a governmental entity may otherwise designate."

- **Stakeholders** - (Excerpt from PPRCN Policy #02-2002) The agencies of the PPRCN Inter-Governmental Agreement (IGA) that provided funding or equipment for the infrastructure of the PPRCN 800 MHz Trunked Radio System. The Stakeholder members are El Paso County, The City of Colorado Springs, and Colorado Springs Utilities.

- **Participants** - Participants are agencies that have completed a Participation Agreement and are current in their payment of annual user's fees. Participants include members, stakeholders, and users.

- **Users** - Users are members, participants, stakeholders, and non-member/non-participants who have been granted authorization to utilize the PPRCN trunked radio system and have authorized talkgroup information programmed into a compatible radio. Non-members/non-participants who are authorized users will have gained access to use the PPRCN trunked radio system through approved authorization to provide mutual aid to a member or participant of the PPRCN.

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Pikes Peak Regional Communications Network (PPRCN)
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Effective Date: 5/5/11 Supersedes: 9/20/07	Approval:		Number: 300
Subject: C-Zone Talkgroup Access Protocols			
Reference: PPRCN Policy and Procedures Manual, PPRCN IGA			
Chapter III - C-Zone Talkgroup Access Protocols	Reevaluation Date:		No. Pages: 2

Purpose: To standardize the process for accessing shared PPRCN Talkgroups.

Procedure: Access to shared PPRCN talkgroups is open to all PPRCN participant agencies. The following subsections have been written to define procedures that streamline access to, and release of, shared PPRCN talkgroups.

I. Requests for Assignments: Responders requesting interagency C-Zone talkgroup resources may include incident commanders functioning within formal ICS command structures or others as needed for response or for planned events. Proposed usages of C-Zone resources are initiated through a request to a dispatch center.

   A. Primary C-Zone Resource Assignment: C-Zone resource assignments are made primarily by the El Paso County Sheriff's dispatch center, which monitors C-1 24x7, and the Colorado Springs Police Department's communications center, which monitors C-16 24x7. These talkgroups provide primary contact for any PPRCN system user in need of one or more interagency talkgroup assignments to support interagency operations.

   - El Paso County Sheriff's dispatch center is responsible for assigning Command and Operational talkgroups C-2 through C-5.

   - Colorado Springs Police Department's communication center is responsible for assigning Command and Operational talkgroups C-6 through C-9.

   B. Once a responding unit has assessed a situation and determined that a command talkgroup is required for management or mitigation of the incident, the responding unit should switch to their appropriate communications center talkgroup, C1 (EPSO.RED) or C16 (CSFD FIRE 1) and request an interagency talkgroup. If these dispatchers are unavailable, the user should attempt to contact a dispatcher on C15 (CSU.DISP.C15).

II. Registration (Re-Contact Information): When a talkgroup is requested, the requesting unit should be prepared to provide an alternate means of contact. If possible, the requesting unit should also provide an estimated time of usage to the dispatcher.

A. If an event is planned, the appropriate dispatch center should be notified as far in advance as practical. Contact information can be provided at that time. Please ensure that changes in contact information are also provided.

B. Agency contacts should be available for contact at the time of the event.

C. When a shared talkgroup is assigned, or there is another status change, dispatch centers will be notified using the dispatch INTERCOM talkgroup or other reliable means.

III. Usage: The interagency talkgroups are typically used for, but not limited to:

- Mutual aid fire operations.
- Severe weather operations.
- Operations between or among different disciplines or jurisdictions.
- Large events requiring the coordination of activities among different agency types.
- Major emergencies involving numerous agencies and multiple incidents.

A. Interagency talkgroups should be utilized anytime two or more jurisdictions or disciplines need a common operations or command channel.

IV. Termination: Agencies will notify the appropriate dispatch center at the termination of an event using interagency PPRCN talkgroups.

A. Should the event require shared resources for a period longer than anticipated, dispatch shall be notified as early as possible, preferably no later than 30 minutes prior to the scheduled termination of the event.

B. If a talkgroup is not released as scheduled, the appropriate dispatch center will attempt to make contact on the radio to check the status of the talkgroup use. If unable to contact anyone on the radio, the user contact information will be utilized to contact the agency and check the status of the talkgroup use.

C. Upon notification, dispatch will update the availability of the talkgroup as outlined in the procedure above.

Pikes Peak Regional Communications Network (PPRCN)
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Effective Date: 8/21/08 Supersedes: 9/20/07	Approval:		Number: 400
Subject: C-Zone Talkgroup Resource and Event Management			
Reference: PPRCN Policy and Procedures Manual, PPRCN IGA			
Chapter IV - C-Zone Talkgroup Resource and Event Management	Reevaluation Date:		No. Pages: 4

Purpose: To foster, manage, and optimize usage of C-Zone resources among all agencies. This section provides for some basic understanding of traffic and service concepts affecting trunked radio networks generally, and the PPRCN network specifically.

Definitions:

- **All Start:** A rule enforced by the central PPRCN system controller that before the call (transmission) can begin, requires all sites and user radios having selected the same talkgroup, to be included on all calls on that talkgroup. The group call must be held in queue until all sites where talkgroup users are affiliated have repeaters available to begin the group's call.

- **Congestion:** Congestion describes a situation wherein a shared system experiences sufficiently high traffic intensity to slow system responses to user requests, i.e. simultaneous requests for service via push-to-talk operations. Congestion is due to instantaneous lack of availability of site repeater(s) so that the user request is queued.

- **Control Channel:** On the control channel, the user radio is receiving regular updates and directives from the network. One example is direction to join a talkgroup call about to be in progress by tuning to the repeater that will be handling that call, at that instant. The user radio will remain on the directed frequency for the few seconds that any system user's push-to-talk switch is activated for that talkgroup. After about a second of talkgroup audio inactivity, the user radios automatically tune back to the control channel for further directives and to monitor the quality of the various adjacent site control channels. All of the information an authorized radio needs to communicate with other radios is passed as data on the control channel at each site. The control channel will never be assigned as a working channel with talkgroup traffic.

- **Conventional Radio:** Repeater-based operation, where specific frequencies are dedicated to specific functions or user groups, and not shared under central control, as in trunked radio. The user tunes his radio, usually using a selector switch. C-Zone conventional examples are 8CALL90 and 8TAC resources. "Conventional" refers to non-trunked repeaters and radios, not routed through the Zone Controller.

- **Priority Assignment:** When all repeaters at a site are simultaneously busy carrying traffic and additional push-to-talk requests from other talkgroups are received, the PPRCN system controller ranks requests and maintains an instantaneously current priority queue, assigning next-call-served priorities according to predetermined rules. Calls are processed in the queue until all remaining service requests have been processed. Priority for service of calls are rated heavily by how long the call has already waited.

  This situation, when congestion must be handled using priorities, is rare, but when several large, simultaneous incidents occur, and talkgroup usage is not cooperatively shared by multiple incident command structures in conjunction with participating communications centers, the system will automatically employ pre-programmed priorities to process requesting traffic.

- **Simplex Operation:** Simplex operation is radio operation directly among local user radios from unit to unit(s) without employing intermediate trunked or conventional repeaters on towers or similar infrastructure. Simplex operation is sometimes referred to as "talk-around." Fire operations in a close area often refer to it as "fire ground channels." One major advantage of using simplex operation is the relieving of site repeater resources.

- **Site Affiliation:** Trunking protocols require nearly continuous communications between the system and the user radio. During the time while no audio is coming from a trunked user radio's speaker, the radio's receiver section continually evaluates the signal quality of several other tower site control channels, and selects the site providing the best signal. This best-site selection process is referred to as site affiliation.

  When a user mobile or portable radio comes nearby to a repeater site, it may switch from a weaker site's control channel where it was being directed, and become re-affiliated onto the network via the nearby site's strong signal. If the signal quality is superior, the user radio starts using the new site's control channel. The central controller recognizes the user radio as being affiliated at the new site.

  The user radio will remain affiliated at the last best site until such time as another site can provide a clearly better signal. Should audio be coming from the radio, e.g., on a talkgroup call, its receiver cannot at that instant also be evaluating signal quality from various other site control channels. Site switching will only occur after several seconds of inactivity on selected and / or scanned talkgroups.

- **Site Availability:** Availability is a concept in a trunked radio system that describes the condition when there is at least one repeater available at that instant for assignment to a talkgroup call. When for a short time, no repeaters are available for assignment of additional talkgroup call requests, there exists a busy condition.

- **Trunked Radio:** Trunking is a term applied to sharing a common pool of communications resources or channels. In the PPRCN system, resources include radio repeaters installed at several tower / infrastructure sites plus one additional transmitter / receiver used as the site control channel. Each repeater is known by its own frequency, so there are as many frequencies available at a site as there are repeaters plus the control channel at the site. All channels at the site, except the control channel, are instantaneously assigned to carry user talkgroup traffic. The site can simultaneously service as many instantaneous calls as there are repeaters operating at the site.

Procedure:

I. Resource Allocation

   A. Nature of Traffic Congestion and Servicing: The number of simultaneous calls a site can handle is related to the number of repeaters that the site has. A site gets congested as the call arrival rate approaches the site's call service rate. Different sites in the PPRCN network have a differing number of repeaters. One PPRCN rural site has only three repeaters besides the control channel. Another PPRCN site covering most of the city has thirteen repeaters besides the control channel. Other sites in the PPRCN network have repeater counts between these two extremes. The difference in traffic handling ability of these extremes is intuitive if one considers a highway analogy. The ability of a thirteen-lane highway to remain free of congestion is vastly different from that of a three-lane highway.

   Each repeater is, at any given instant, assigned when any user's push-to-talk switch anywhere in the network is keyed. Within a second or so after the last push-to-talk in the talkgroup is released, the repeater at every site that has been involved becomes available to handle a call for another talkgroup.

   When at any instant, user traffic is sufficiently intense that all repeaters at a certain site are keyed, for instance if there are four available repeaters at a site and a fifth call is attempted on a talkgroup affiliated at that site, the fifth talkgroup call, system wide, is placed into a queue awaiting repeater availability. Before that call is serviced, repeater availability must be simultaneously found at all sites where users on that talkgroup are affiliated. Accordingly, a widely selected talkgroup call will probably be delayed more than other calls when many sites are congested, since the wide call requires more sites to simultaneously have a repeater available.

   B. Mitigation of Busy Channels or Congestion: Several keys to mitigating the occurrence or extent of congestion include:

   - Try to steer communications as much as possible away from having to employ network repeater sites. For instance, if working among other users in relatively close proximity to each other, use the simplex capabilities built into the radios - those capabilities that allow groups of users to talk directly among themselves, not via the network's tower repeaters.

- Users should limit their radio operation and its associated site affiliation during times when congestion actually becomes, or could become, a problem. This is especially important to avoid affiliation at those more rural sites where fewer repeaters are available to handle the simultaneous traffic. If one's radio is not needed in the service of an incident, particularly in the more rural areas, turn it off!

- Understand how the user radio's normal operation differs while congestion is being experienced, and err on the side of communicating less over the shared network, if at all possible.

- Limit radio communications as much as is possible, whether talking or listening, and assure all communications passed have a sufficiently important reason to be offered over the shared PPRCN network, while other alternative means to communicate may be available.

- Monitoring activity distant from your location: Don't place the channel selector of your radio on a busy talkgroup that is in use distant from your location, while your radio is affiliated to a rural site with a limited number of frequency pairs like Calhan, Truckton, Mt. Pittsburg, or Woodland Park. Monitoring in this fashion could cause a busy condition in the distant area and in your operational area at the same time, due to limited radio site resources. If you have to use a distant agency talkgroup in an incident area, coordinate with the incident commander so that they are aware of the potential busy conditions. Note: Scanning the distant talkgroup is permitted, as long as the scanning radio does not have the distant talkgroup selected as the primary or active channel. Users should also understand that scanning does not always result in the user receiving all transmissions taking place on a scanned talkgroup.

- Stop using and monitoring as many talkgroups as possible. Rearrange normal and incident operations to as few talkgroups as can be employed to handle both the operational traffic and incidents. Since all radios in the network are required to contain the common C-Zone channels, 1) anyone having a PPRCN radio instantly has the ability to cooperate on one or many assignments or incidents, and 2) radios normally used for limited functionality can be re-employed onto fewer talkgroups with broader content or impact.

C. Diminishing Resource Allocation: During congestion, assure that network traffic is viewed and evaluated in real time for opportunities to affect overall increases in grades of service. Recommendations by persons qualified to evaluate instantaneous congestion need to be regularly communicated to incident managers, communications managers, and communication center dispatch personnel. Recommendations should be made dynamically, as long as severely congested conditions exist. Recommendations and operational changes actually made must continue to be monitored and re-evaluated to assure the recommendations were, and actually remain, effective.

At the end of the congestion period, all network parameters that may have been changed to mitigate congestion need to be reset to their normal settings.

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Pikes Peak Regional Communications Network (PPRCN)
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Effective Date: 5/5/11 Supersedes: 8/21/08	Approval:	Number: 430
Subject: C-Zone Radio Procedures		
Reference: PPRCN Policy and Procedures Manual, PPRCN IGA		
Chapter IV - C-Zone Talkgroup Resource and Event Management	Reevaluation Date:	No. Pages: 3

Purpose: To maximize resources on the C-Zone for all agencies.

Definitions:

- **Call Sign Designation** - Radio identifiers, which may be agency, personnel, and equipment specific.

- **C-Zone Dispatchers** - The El Paso County Sheriff's Office (EPSO) Communications Section and the Colorado Springs Police Department (CSPD) Fire Dispatchers.

Procedure:

I. C-Zone Talkgroups:

A. **(C1) EPSO RED** - EPSO RED is the primary fire and medical dispatch talkgroup for unincorporated El Paso County, the cities of Calhan, Green Mountain Falls, Monument, Palmer Lake, and Ramah.

B. **C2 - C9** - Command and Operational Talkgroups
   - Assigned in numerical order.
   - Number of talkgroups assigned based on request.
   - EPSO assigns C2 - C5; CSPD assigns C6 - C9

C. **(C10) 8CALL90** - An International Interoperability channel that is a Dispatch-monitored resource for requesting repeated radio channels. See Section VI.

D. **(C11-14) 8TAC91 - 8TAC94** - International Interoperability channels. See Section VI for use.

E. **(C15) CSU.DISP** - Colorado Springs Utilities Dispatch.

F. **(C16) CSFD.FIRE1** - Colorado Springs Fire Department's primary fire dispatch talkgroup.

II. Dispatch Benchmarks: Recognition of event resources and capabilities expanding beyond normal operational boundaries. When an Incident Commander finds his event requiring additional communications talkgroup assets he, or a designated representative, must request additional assets. Do not expect the dispatch center monitoring your event to recognize your needs in advance.

III. Identifying personnel or equipment by radio transmission: Call signs are assigned to equipment and personnel who work in the emergency service system. Members of the system shall provide their "call sign" when requesting the assignment of C-Zone Talkgroups.

IV. Recording of Information:

   A. Members shall announce their "call sign" and stand by for a response from the EPSO or CSPD dispatcher. The dispatcher will announce the "call sign" and state "Go Ahead". The member shall again state their "call sign" and their request for the Talkgroup assignment (Wescott 501 requests a talkgroup for a North Group structure fire.).

   B. The dispatcher will assign the next available talkgroup and (EPSO only) will record the assignment in the Computer Aided Dispatch (CAD) system utilizing the C-Zone Talkgroup numbers (C1, C2, C3, etc.).

   C. Dispatchers record requests and information provided by members utilizing C-Zone 2-9 Talkgroups. Members are to communicate with EPSO dispatch through C1 EPSO.RED and CSPD dispatch through C16 CSFD.FIRE.1.

V. Notifications: EPSO, CSPD, and Utilities will notify each other when any C2 - C9 Talkgroups are assigned. Notification will be made via Intercom and may be followed by CAD to CAD messaging, where applicable.

VI. International Interoperability Channels: These channels are allocated as required channels under the FCC Rules & Regulations, as well as the Region 7 800 MHz Regional Planning Committee (RPC) plan, for all users in the NPSPAC (National Public Safety Planning Advisory Committee) frequency band. These channels may be used in Repeater mode, as described below, or in Direct/Simplex mode for on-scene conventional radio to radio communications. Plain language will be used on all five International Interoperability Channels at all times, and the use of unfamiliar terms, phrases, or codes will be kept to a minimum, unless deemed necessary for security purposes. The use of these channels for intra-system normal dispatch and routine agency operations is strictly prohibited. Normally, the five International Interoperability Channels are to be used only for activities requiring communications between agencies not sharing any other compatible communication system. Under emergency situations, one or more Tactical Channels may be assigned by the controlling agency at the time of the incident.

   (C10) 8CALL90 - Frequency: 806.0125   PL Code: 156.7
   This is a calling channel used to contact other users in the Region for the purposes of requesting incident related information and assistance. It shall not be

used as an ongoing working channel. Once contact is made, an agreed upon tactical channel to use is recommended or assigned by a dispatch center for continued communications. This is a repeated channel located at: Green Mountain; **Colorado Springs-Pittsburg**; **El Paso County/Stanley**; Guy Hill; and Cheyenne, WY.

Channels 11, 12, 13 and 14, (8TAC91, 8TAC92, 8TAC93 and 8TAC94) are reserved for use by agencies in need of conducting inter-agency communications. Incidents requiring multi agency participation will be coordinated over these channels by the agency controlling the incident.

(C11) 8TAC91 -   Frequency: 806.5125   PL Code: 156.7
In the PPRCN core region, this channel can only be used in its simplex mode. There are repeaters located outside of the PPRCN core at: Mt. Morrison, Pueblo State Shop, Limon, Raton Pass, and Alamosa.

(C12) 8TAC92 -   Frequency: 807.0125   PL Code: 156.7
This channel is repeated from the Stanley site making it available for duplex operation in the northern portion of the PPRCN operational area if the user desires. Operations elsewhere in the operational area should be conducted using simplex. Sites are located at: Hampton & Parker, **El Paso County-Stanley**, HorseTooth, Bowen Marker, and Chevron.

(C13) 8TAC93 -   Frequency: 807.5125   PL Code: 156.7
This channel is repeated from the Pittsburg site making it available for duplex operation in the southern portion of the PPRCN operational area if the user desires. Operations elsewhere in the operational area should be conducted using simplex. Sites are located at: Smoky Hill, Weld & 35th, **Colorado Springs-Pittsburg**, and Sterling State Shop.

(C14) 8TAC94 -   Frequency: 808.0125   PL Code: 156.7
In the PPRCN core region, this channel can only be used in its simplex mode. There are repeaters located outside of the PPRCN core at: Riley Peak; Lamar State Shop; La Junta; and Cheyenne, WY.

VII. Flight Operations: When they possess the equipment to do so, EMS helicopters should communicate with ground personnel at incidents using STACD. If they do not have the capability of talking on the PPRCN system, another option is for them to use FERN1 (VHF simplex) Patching EMS helicopters to PPRCN trunked talkgroups should be avoided.

VIII. Events (Planned or Unplanned): The use of the C-Zone talkgroups is by request only. You may request the use of these talkgroups, as outlined in Procedure 300, whether the event is planned or unplanned. The responding Dispatch Center will use its means and resources to assist in bringing all the requested agencies to the assigned talkgroup.

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Effective Date: 9/20/07 Supersedes:	Approval:		Number: 500
Subject: Regional Response Considerations			
Reference: PPRCN Policy and Procedures Manual, PPRCN IGA			
Chapter V - Regional Response Considerations		Reevaluation Date:	No. Pages: 1

<p style="color:red; text-align:center;">**This section is currently Under Development.**</p>

Purpose:

Definitions:

Procedure:

I.   South Central Region - Homeland Security

II. Tactical Interoperable Communications (TIC) Plan

III. Mutual Aid Agreements

IV. Ancillary Mutual Aid Resources

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Pikes Peak Regional Communications Network (PPRCN)
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Effective Date: 9/20/07 Supersedes:	Approval:		Number: 600
Subject: Multi-Agency Incident Responses			
Reference: PPRCN Policy and Procedures Manual, PPRCN IGA			
Chapter VI - Multi-Agency Incident Responses	Reevaluation Date:	No. Pages: 1	

Purpose: To require the use of the National Incident Management System for the management of all incidents, when agencies require the use of the C-Zone Interagency talkgroups.

Procedure:

I. National Standard: In 2003, the Department of Homeland Security established the National Incident Management System (NIMS), as required by Homeland Security Presidential Directive (HSPD) - Management of Domestic Incidents and National Preparedness. HSPD-5 and HSPD-8 require all government agencies adopt and utilize NIMS.

   This system encompasses more than the Incident Command System (ICS). It also provides a common foundation for training and preparedness efforts, communication and information sharing, resources ordering, and for integration of new technologies and standards. This system requires all emergency responders to use a common language and set of procedures when working individually and together.

II. PPRCN Requirement: In order to ensure responder safety and a common operational incident response, the PPRCN requires all participating agencies to adopt the National Incident Management System. All agencies that respond and operate within the PPRCN region are to incorporate the principals of NIMS and establish Incident Command when responding individually or mutually with other agencies.

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Effective Date: 9/20/07 Supersedes:	Approval:	Number: 620
Subject: Establishing Command		
Reference: PPRCN Policy and Procedures Manual, PPRCN IGA		
Chapter VI - Multi-Agency Incident Responses	Reevaluation Date:	No. Pages: 1

Purpose: To establish the procedures to be utilized when establishing Incident Command during Multi-Agency Incidents.

Procedure:

I. During all Multi-Agency Incidents, an Incident Command will be established. The initial Incident Commander will be a representative of the jurisdiction having authority at the location of the incident. Multi-jurisdictional incidents will utilize a Unified Command.

   A. The Incident Command structure will meet the guidelines established in the National Incident Management System (NIMS). All agencies are expected to understand and adopt NIMS for incident management. The type and size of the command structure is dependent on the type and size of the incident, and will be determined by the Incident Commander.

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Pikes Peak Regional Communications Network (PPRCN)
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Effective Date: 9/20/07 Supersedes:	Approval:	Number: 621
Subject: Command Structure		
Reference: PPRCN Policy and Procedures Manual, PPRCN IGA		
Chapter VI - Multi-Agency Incident Responses	Reevaluation Date:	No. Pages: 1

Purpose: To identify the command structure utilized for all incidents occurring the PPRCN region.

Procedure:

I. Multi-Agency Incidents occurring within the PPRCN region will have a command established and identified. The command structure will be aligned with the standards set forth in the National Incident Command System. All incidents will have at least an Incident Commander.

   A. The remaining Command and General Staff positions will be filled as necessary. Command should consider establishing a Safety Officer and Public Information Officer for all incidents.

   B. The duties associated with Command and General Staff positions that are not staffed during an incident remain the responsibility of the Incident Commander.

II. Command will notify all responding agencies, as appropriate, identifying which Command and General Staff positions have been staffed and the method for contacting those individuals.

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Effective Date: 9/20/07 Supersedes:	Approval:	Number: 622
Subject: Command Post		
Reference: PPRCN Policy and Procedures Manual, PPRCN IGA		

Chapter VI - Multi-Agency Incident Responses	Reevaluation Date:	No. Pages: 1

Purpose: To require the establishment of an identifiable Incident Command Post for the management of an incident.

Definitions:

- **Incident Command Post (ICP)** - The ICP signifies the location of the tactical-level, on-scene incident command and management organization. It typically comprises the IC and immediate staff and may include other designated incident management officials and responders from Federal, State, local, and tribal agencies, as well as private-sector and nongovernmental organizations. Typically, the ICP is located at or in the immediate vicinity of the incident site and is the locus for the conduct of direct, on-scene control of tactical operations. Incident planning is also conducted at the ICP; an incident communications center also would normally be established at this location.

Procedure:

I. When an agency responds to an incident and establishes an incident command, an identifiable location is required for that command. This location should be outside of the immediate danger area.

   A. Once established, the Incident Commander should announce the location of the ICP on the appropriate C-Zone talkgroup to ensure all responders and dispatching agencies are aware of the location of the ICP.

   B. It is customary to utilize a revolving or flashing green light to signify the location of the ICP. Additional signage may be required for extended operations. This will provide direction to the location of the ICP, Command, and General Staff areas.

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Pikes Peak Regional Communications Network (PPRCN)
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Effective Date: 9/20/07 Supersedes:	Approval:		Number: 623
Subject: Unified Command			
Reference: PPRCN Policy and Procedures Manual, PPRCN IGA			
Chapter VI - Multi-Agency Incident Responses	Reevaluation Date:		No. Pages: 1

Purpose: To improve responder safety and coordination during multi-agency incidents.

Definitions:

- **Unified Command** - Unified command is an effective command structure used when multiple agencies encompassing different disciplines or jurisdiction are operating at the same incident. The Primary leaders join together to establish a joint command.

Procedure:

I. Managing a response, especially a complex, multi-jurisdictional response, is one of the most important challenges facing the Incident Commander. Effective coordination among local and other responders at the scene of a response is a key factor in ensuring successful responses to major incidents. A Unified Command (UC) is an efficient on-site tool to manage all emergency response incidents.

II. Initial Incident Commanders (IC) at incidents involving multiple agencies encompassing different disciplines or jurisdiction should consider establishing a Unified Command. Unified command should be comprised of the current IC and a leader from each of the other involved agencies or disciplines, as appropriate.

  A. The initial IC will identify the other agencies or disciplines to be involved in the Unified Command. Unified Command will direct all activities jointly as the incident command.

III. When Unified Command is established, it will notify all responding agencies and the appropriate dispatch center. Notification will include the agencies involved in command and the location of the Incident Command Post.

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Pikes Peak Regional Communications Network (PPRCN)
C-Zone Operational Procedures

Effective Date: 9/20/07	Approval:	Number: 700
Supersedes:		
Subject: Event and Incident Sound Recordings		
Reference: PPRCN Policy and Procedures Manual, PPRCN IGA		
Chapter VII - Event and Incident Sound Recordings	Reevaluation Date:	No. Pages: 2

Purpose: To provide guidelines for processing requests of audio recordings from Talkgroups C1 through C9. These Talkgroups are solely recorded by the El Paso County Sheriff's Office.

Definitions:

- **EPSO:** El Paso County Sheriff's Office

- **ESD:** Emergency Services Dispatcher

- **CD:** Compact Disc

Procedure:

I. Filling out a Request Form

A. Audio recordings may be requested by supervisory personnel assigned to Law Enforcement, Fire, Medical, and Emergency Operation agencies through the El Paso County Sheriff's Office Communications Center, by calling 719-391-8917 or 719-390-5555.

B. The verbal or written request must contain the following information: name of requesting party, associated agency, talkgroup(s) name, incident type, location, date of incident, time frame to be recorded, and method of distribution.

II. Completion of Request:

A. An ESD shall be assigned the task of completing tape requests within 72 hours, as set forth by the EPSO Communications Center.

B. The requestor shall receive the audio file as a wave file, through e-mail or on a CD. If a CD format is requested, the CD may be picked up in person at the EPSO Communications Center at 2739 E. Las Vegas St., or be mailed to the requestor via the US Postal Service.

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Pikes Peak Regional Communications Network (PPRCN)
C-Zone Operational Procedures

Effective Date: 9/20/07 Supersedes:	Approval:	Number: 800
Subject: User Training and Qualifications		
Reference: PPRCN Policy and Procedures Manual, PPRCN IGA		
Chapter VIII - User Training and Qualifications	Reevaluation Date:	No. Pages: 1

This section is currently Under Development.

Purpose:

Definitions:

Procedure:

I.   Training Development and Dissemination (810)

II. Exercises and Structured Practices (820)

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Pikes Peak Regional Communications Network (PPRCN)
C-Zone Operational Procedures

Effective Date: 8/21/08 Supersedes: 9/20/07	Approval:	Number: 900
Subject: System Outage		
Reference: PPRCN Policy and Procedures Manual, PPRCN IGA		
Chapter IX - System Outage	Reevaluation Date:	No. Pages: 3

Purpose: To provide a clear understanding of the different types of outages that can occur on the PPRCN 800 MHz Trunked Radio System and recommend a course of action.

Definitions:

- **Site Trunking** - Site Trunking is a failure scenario that occurs when a Trunking site is no longer capable of communicating with the system. In Site Trunking mode, a user's radio will only be able to communicate with other users affiliated on the same site. The radio will always try to move to another site that is not in Site Trunking. Site Trunking is commonly seen during system upgrades or maintenance, or when the infrastructure interconnecting that site to the Zone Controller has failed. Radios may be programmed to display and/or emit an alert tone during this condition.

- **Failsoft** - Failsoft is a failure scenario whereby site channels are assigned in conventional mode if all trunking capabilities have failed. Currently Failsoft is not supported on the PPRCN or State DTR system.

Procedure:

I. System Outage - System outages can take on as many characteristics as can be imagined, in highly complex systems such as employed in the PPRCN 800 MHz Trunked Radio System. All reasonable precautions have been implemented by the vendor, Motorola, and the PPRCN to mitigate as much potential for a single point of failure and a total system outage, by use of redundant backup components and power at the primary site. Dispatch centers have placed dispatch consoles in separate card cages to try to ensure an environment where the whole center is not dependent on any one single point of failure. Having said this, it is still possible that there could be a total system failure caused by a lack of power, corruption of databases, and or a failure of multiple components.

II. Lack of Contact with Dispatch - Any time a PPRCN User is unable to raise his or her dispatch after multiple attempts, they should consider the system has experienced some level of outage. The user should change their radio to the 8CALL90 channel (C10 in the C-Zone), hail a dispatch center, and let them know they are unable to

contact their dispatch. The user should also identify the general area where the user is located and whether or not they have an alternate means (cell phone, etc.) of communicating.

A. The Dispatch Center monitoring and responding to the user is to:

1. Unknown/Unplanned Outage - Contact the appropriate dispatch center and coordinate an 8TAC channel or other means of communications. Once determined, the user will be contacted on 8CALL90 and be directed as appropriate.

2. Known/Planned Outage - Direct the user to the appropriate means of communications, as planned and published.

III. Notification of PPRCN Systems Manager - Upon knowledge of an unplanned outage, it cannot be assumed that the PPRCN System Manager is aware. Therefore, Dispatch Centers made aware of a system outage of at least a site trunking level should follow jurisdictional procedures in notifying their chain-of-command, including the PPRCN Systems Manager.

IV. Notification of PPRCN Systems Maintenance Provider - Upon knowledge of an unplanned outage it cannot be assumed the PPRCN Systems Maintenance Provider is aware. If their local procedures allow, the Dispatch Center should directly notify the PPRCN Systems Maintenance Provider.

V. Temporary Emergency Operations During System Outages -

A. The PPRCN Systems Manager will contact designated representatives, and/or contact numbers for the dispatch centers on the system, to include the Colorado Springs Police Department Dispatch Center, El Paso County Sheriff's Office Dispatch Center, Colorado Springs Utilities Dispatch Center, Manitou Springs Dispatch Center, Woodland Park Dispatch Center, and Fountain Dispatch Center to inform them of the outage. Dispatch Centers are responsible for notifying the agencies they dispatch for.

B. The El Paso County Sheriff's Office Dispatch will monitor 8CALL90, perform roll call for all police and fire agencies they dispatch, and if not in use, move the county fire districts to MAC 10.

C. The Colorado Springs Police Department Dispatch Center will monitor 8TAC92, perform roll call for all police and fire agencies they dispatch, and if not in use, will move appropriate agencies to MAC 11.

D. The Colorado Springs Utilities Dispatch Center will monitor 8TAC93 and perform roll call for all departments they dispatch for.

E. Fountain, Manitou Springs, and Woodland Park Dispatch centers are expected to revert to UHF and or VHF frequency and systems they have licensed for operation.

F. MAC 9 shall be held open for other agencies of the Southeast Region of the State DTR system and agencies outside of the PPRCN system coming into the PPRCN System of operations for mutual aid.

G. MAC 12 shall be held open for mutual aid events between agencies of the PPRCN in our area of operations.

H. All agencies are reminded that there are resources available through the Emergency Management System for Amateur Radio Operators from RACES or ARES. Contact the City or County Emergency Manager.

VI. Long Term Emergency Operations During System Outages -

A. If an outage is expected to be of a longer duration than 24 hours, the PPRCN Systems Manager will call for an emergency meeting of the PPRCN Board of Directors to discuss the outage, known alternatives, known vendor support, and recommended operational procedures for the prolonged outage.

B. Once determined by the PPRCN Board of Directors, it is the responsibility of the PPRCN Systems Manager to inform the users of the PPRCN System, what actions are being taken to restore the system and the mandated operational procedures for users during the outage.

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Pikes Peak Regional Communications Network (PPRCN)
C-Zone Operational Procedures

Effective Date: 8/21/08 Supersedes: 9/20/07	Approval:		Number: 1000
Subject: Terms and Definitions			
Reference: PPRCN Policy and Procedures Manual, PPRCN IGA			
Chapter X - Terms and Definitions		Reevaluation Date:	No. Pages: 11

Purpose: To create a clear understanding of terms used in the PPRCN 800 MHz Radio System.

Definitions:

- **700 MHz** - A new public safety frequency band for voice and data, including wideband data channels. Frequencies are between 764 and 806 Megahertz.

- **800 MHz** - This refers to the primary range of frequencies that are utilized in the PPRCN radio network. Usually this term is applied to any network that broadcasts on frequencies between 800 and 900 Megahertz.

- **AGENCY** - The lowest level of structure within the member structure of the PPRCN. Each agency must sign a Participation Agreement. Examples include the XXX Fire Department or XXX Police Department.

- **ALIAS** - Proper names representing a Unit ID. Example: "XPD Smith" or "XFD Eng32".

- **All Call** - Console feature which allows a dispatcher or supervisor to communicate to all system subscribers at one time. This may be used for major events or emergencies.

- **All Start** - A rule enforced by the central PPRCN system controller, that before the call (transmission) can begin, requires all sites and user radios having selected the same talkgroup, to be included on all calls on that talkgroup. The group call must be held in queue until all sites where talkgroup users are affiliated have repeaters available to begin the group's call.

- **Amplifier** - A device for creating an increase in voltage, current, or power.

- **Amplitude** - The maximum departure of the value of an alternating current or radio wave from the average value.

- **Analog** - Whenever a person speaks, sound is projected in the form of a sound wave. These waves move at a certain frequency that determines the pitch of the

sound. An analog radio network transmits the actual wave of a person's voice over the air by modulating it onto a radio frequency carrier. An analog network operates differently from a digital network, which converts the vocal sound wave into a digital bit stream of ones and zeros. This information is then sent over the air, and eventually converted back into an analog wave to be heard.

- **Announcement Group** - This is the same as <u>All Call</u> above.

- **Antenna** - A device (usually metallic) for radiating or receiving radio waves.

- **Antenna Gain** - The effectiveness of a directional antenna, expressed as the ratio in decibels of standard antenna input power to the directional antenna input power that will produce the same field strength in the desired direction.

- **APCO** - This stands for The <u>A</u>ssociation of <u>P</u>ublic Safety <u>C</u>ommunications <u>O</u>fficials. This agency is composed of many different public safety employees and representatives from around the world. APCO was one of the lead agencies in the development of the Project 25 Radio Standard, on which the current PPRCN radio system is based.

- **ASTRO** - This is a type of radio communication system developed by Motorola that utilizes narrowband digital technology. This system makes good use of available frequencies, and allows for greater security than older systems.

- **ATIA (Air Traffic Information Access)** - In a Motorola SmartZone system, this is an Ethernet port that 'streams' information about usage on the system.

- **Automatic Vehicular Location (AVL)** - A sub-system which interfaces with a radio system to communicate the actual geographic position of the AVL device.

- **Backward Compatibility** - This term refers to the capability of a piece of equipment (i.e. software program, hardware component) to be compatible with its predecessor, in all forms. For instance, Microsoft Word 2000 is backward compatible since it can create, open, and modify documents that will run in Microsoft Word '97.

- **Band - A well-defined range of wavelengths or frequencies.**

- **Bandwidth** - The range within a band of frequencies. A measure of the amount of information that can flow through a given point at any given time.

- **Base Station** - This term refers to a stationary radio connected to an antenna. The antenna is located where it can transmit into and receive from a geographic area where mobile and portable radios are being operated. In the PPRCN system, the mobile and portable radios can communicate at extended distances from each other by communicating through the base stations. (See Repeaters) The mobile and portable radios can also communicate with dispatchers at radio consoles, who are remotely operating the base station radios via the system.

- **BDA** - Bi-directional amplifier, a device that is used to extend your coverage area, usually within a building or structure like a tunnel.

- **BSI** - Base Station Identifier. The Morse Code version of the FCC call sign. The Radio System Controller sends this out over the lowest frequency channel on the trunk system every half hour.

- **CCNC** - Consolidated Communications Network of Colorado (www.ccncinc.org)

- **CEB** - Central Electronics Bank. This Motorola hardware and software allows the radio system Gold Elite consoles and consolettes to interact with the radio system.

- **CIT** - Central Interconnect Terminal. This was also known as the PassPort. This is the hardware that makes telephone calls possible, using a radio.

- **Combiner** - A device used to combine the output signals from a number of transmitters connected to the same antenna.

- **Common Air Interface (CAI)** - This refers to the protocol by which handheld and mobile radios communicate with the radio system infrastructure. In modern radio systems, this is typically a proprietary format; however, the CAI, defined by the Project 25 Standard, makes this an open protocol. This allows different manufacturers' portable and mobile radios to work together on a single radio system.

- **Congestion** - Congestion describes a situation wherein a shared system experiences sufficiently high traffic intensity to slow system responses to user requests; i.e. simultaneous requests for service via push-to-talk operations. Congestion is due to instantaneous lack of availability of site repeater(s) so that the user request is queued until the system is able to handle the request.

- **Console** - A console is the user radio interface used by Dispatchers to communicate with users in the field. Consoles communicate with radio users by direct connection with the system controller. See Consolette.

- **Consolette** - A consolette is a user radio interface used by Dispatchers to communicate with users in the field. Consolettes are similar to base stations, in that they operate independently of the system controller, communicating directly with a radio site with which they have been configured to affiliate. See Console.

- **Control Channel** - On the control channel, the user radio is receiving regular updates and directives from the network. One example is direction to join a talkgroup call about to be in progress by tuning to the repeater that will be handling that call, at that instant. The user radio will remain on the directed frequency for the few seconds that any system user's push-to-talk switch is activated for that talkgroup. After about a second of talkgroup audio inactivity, the user radios automatically tune back to the control channel for further directives and to monitor the quality of the various adjacent site control channels.

All of the information an authorized radio needs to communicate with other radios is passed as data on the control channel at each site. The control channel will never be assigned as a working channel with talkgroup traffic.

- **Controller** - The "Brain" or computer systems that makes all of the channels trunk together.

- **Conventional Radio** - Repeater-based operation, where specific frequencies are dedicated to specific functions or user groups, and not shared under central control, as in a trunked radio. The user tunes his radio, usually using a channel selector switch. C-Zone conventional examples are 8CALL90 and 8TAC resources. "Conventional' refers to non-trunked repeaters and radios, not routed through the Zone Controller.

- **Coverage/Coverage Area** - A radio network's coverage area refers to the entire area that gets a strong enough signal from the network, for a radio in the field to reliably transmit and receive. Once a signal from a network degrades so badly that it is essentially useless, and all transmissions are bad or impossible, then that area is considered to be out of the coverage area. The PPRCN 800 MHz digital network has a projected coverage area that spans the entire El Paso, Teller and Park County areas. The coverage area is often called the "footprint" of a network.

- **Digital** - The term "digital" refers to the method of expressing information in one of two different electronic states, which are usually designated as ones or zeros. These ones and zeros form a pattern that can be translated into all kinds of information. Relaying digital information through an electrical system is done by transmitting electronic pulses with one of two distinct electrical voltages. These pulses are usually referred to as either "1" or "0", with the "1" pulse usually having a higher voltage than the "0" pulse. Electronic equipment, such as computers, can interpret the information by: a) receiving a set of electronic pulses, b) sensing the different voltages of the pulses, therefore determining whether each pulse is a "1" or a "0", and c) combining many of these ones and zeros to form instructions that tell the computer what to do.

- **DTR** - Digital Trunked Radio

- **Duplex** - The ability to talk and listen on an audio device at the same time. This is the way your normal telephone at home works. See "Half Duplex" or "Simplex Operation".

- **Dynamic Site Assignment** - Allows a channel assignment only at sites necessary to reach all active talkgroup members.

- **Emergency Button** - Emergency buttons, or emergency alert buttons, are available on every PPRCN subscribers' radio. When depressed, a predetermined channel is assigned to the user, with the highest priority assigned to the emergency user's radio. Each radio in the PPRCN system alerts a 24/7 staffed communication center.

- **Encryption** - An electronic method to secure information that is being transmitted. The reason this security technique is so effective is because the encrypted transmissions can only be deciphered by a radio with the proper decryption key. This key consists of a software application that is programmed into the authorized radios.

- **Fail Soft** - This is an automatic fall back mode of communication offered in the event that the trunking central controller fails, all control channels fail, or failure of all voice channels. The repeaters independently enter the fail soft mode when the central zone controller no longer controls them; this is a form of carrier squelch community repeater operation.

- **FCC** - The Federal Communications Commission. This governmental agency decides how frequencies are to be used, as well as who can transmit on them. The FCC sets aside specific amounts of frequencies for public safety transmissions, commercial wireless carriers, television broadcasts, etc. Traditionally, the FCC grants blocks of frequencies to public safety agencies, while commercial carriers must buy a license to transmit from the FCC.

- **Firmware** - Hardware component, such as EEPROM's, which are programmed to contain software-like instructions are commonly referred to as Firmware.

- **Frequency** - All radio networks broadcast their transmissions through antennas on a certain frequency. The number of the frequency refers to the number of times that an electromagnetic wave repeats in the span of one second. For example, a transmission being sent at 800 MHz means that its wavelength repeats 800,000,000 times per second. With sophisticated electronic equipment, these waves can be engineered to carry large amounts of information over great distances.

- **Gateway** - A device that connects different networks to provide interoperability. Two or more independent systems are electronically connected so radio traffic on one system's channel/talkgroup is duplicated on another agency's channel/talkgroup.

- **Half-Duplex** - See "Simplex Operation."

- **Intelligent Site Repeater** - An Intelligent Site Repeater is a radio site which utilizes a device called a site controller. This controller can perform all call processing and channel assignment tasks that are required to operate the site's base stations. Dynamic repeater selection is utilized to ensure the proper numbers of repeater resources are available for users to transmit and receive on any of the repeater sites.

- **Interoperability** - This term refers to the capability of separate and independent entities to work together seamlessly. The PPRCN 800 MHz network will promote full interoperability between all participating agencies. This feature is incorporated in this network as part of the Project 25 standard.

- **IP** - IP, or Internet Protocol, is a method by which data is transferred over a network. IP is widely used across the Internet. Every computer attached to the Internet is assigned a unique number, called an IP address. Using IP, a data transmission is split electronically into smaller pieces of data called packets. Every data packet contains two IP addresses: one for the sending computer, and one for the receiving computer. These addresses help route the packets of a digital message to its proper destination.

- **Link** - In the Trunking World, this refers to microwave or phone line connectivity that ties one central controller in one location to another. This could be a backup central controller or part of an Automatic Multiple Site Select (AMSS) system.

- **Loading** - The FCC awards licenses for frequency usage based on an expectation that there will be a minimum number of users on each channel by a certain time. This amount of users per channel is referred to as loading. For instance, if a wireless network builder purchased licensing for 20 channels from the FCC, then the FCC might stipulate that there must be a certain amount of loading, or users per channel, by a certain time. If the network provider does not meet the loading requirements, their license would be returned to the FCC. The FCC does this to provide incentive for carriers to make good use of their purchased frequencies. In the case of a public safety network, the FCC grants channels to government agencies (as opposed to selling them), but still requires a certain amount of loading. When all the channels that have been provided from the FCC cannot handle any additional radio users, the system is referred to as fully loaded.

- **MAC Talkgroup/Channel** - Mutual Aid Channel. These are channels setup for the Statewide Mutual Aid System. These channels are grouped for geographic areas of the state.

- **MDC** - An MDC, or Mobile Data Computer, is a vehicle-mounted computer that is wirelessly linked to a radio network. An MDC can allow an operator, such as a police officer or firefighter, to access information from the network, such as missing persons files or driving records. In addition to this, an MDC has all the capabilities of a personal computer, so an operator may use the MDC for storing information or running various applications. This is in contrast to a mobile data terminal (MDT), which is primarily just for viewing information gathered from the network.

- **MDT** - An MDT, or Mobile Data Terminal, is a vehicle-mounted keyboard and display that is wirelessly linked to a radio network. An MDT can allow an operator such as a police officer or firefighter to access information from the network, such as missing persons files or driving records. MDT's are primarily used to view information from the network and do not have the capability of operating applications independently from the network. This is in contrast to an MDC, which is capable of many other activities.

- **Mobile** - In radio systems, the term mobile is usually used when referring to a vehicle-mounted radio unit. This is different from a portable radio, which refers to a handheld radio.

- **Multi-Select** - A feature available to console Dispatchers. Two or more groups are simultaneously selected for the same transmission from the dispatcher - but remain separate groups. Response from radio users is by group and only members of each unique group are able to hear the response.

- **Mux** - Multiplexer. A device that performs multiplexing. Multiplexing, or muxing, is a term used to refer to a process where multiple analog message signals or digital data streams are combined into one signal.

- **Narrowband** - In radio systems, the term narrowband refers to the size of a channel, with regards to frequency. In the PPRCN 800 MHz digital trunked radio system, all voice channels will have a bandwidth of 12.5 kHz, which is considered to be narrowband.

- **NASTD** - National Association of State Telecommunications Directors

- **NPSPAC** - This stands for the National Public Safety Planning Advisory Committee. In the 1980's, the FCC reallocated a block of radio channels in the 800 MHz band for public safety communications. NPSPAC was set up by the FCC to determine how these channels were going to be used. NPSPAC developed a usage plan that divided the country into many different regions, and the public safety agencies in these regions would have exclusive use of the NPSPAC frequencies. These regions would then, in turn, develop a plan for their own respective frequency usage. The PPRCN 800 MHz radio network uses NPSPAC channels for its operation.

- **Patching** - In radio systems, the term "patch" usually refers to the ability to marry two separate talkgroups into one. This is accomplished by using software to link two separate talkgroups via the dispatch console, or another radio console, at a communications center.

- **Portable** - In radio systems, the term portable usually refers to a handheld radio. This differs from a mobile radio, which would refer to a radio hard-mounted inside a vehicle.

- **PPRCN** - Pikes Peak Regional Communications Network.

- **Priority Assignment** - When all repeaters at a site are simultaneously busy carrying traffic and additional push-to-talk requests from other talkgroups are received, the PPRCN system controller ranks requests and maintains an instantaneously current priority queue, assigning next-call-served priorities according to predetermined rules. Calls are processed in the queue until all remaining service requests have been processed. Priority for service of calls are rated heavily by how long the call has already waited.

This situation, when congestion must be handled using priorities, is rare, but when several large, simultaneous incidents occur, and talkgroup usage is not cooperatively shared by multiple incident command structures, in conjunction with participating communications centers, the system will automatically employ pre-programmed priorities to process requesting traffic.

- **Project 25** - Project 25 is a set of guidelines developed by radio system users for the purpose of standardizing the method of designing radio telecommunications networks for public safety agencies. Agencies such as the Association of Public Safety Communications Officials (APCO), the National Association of State Telecommunications Directors (NASTD), the Telecommunications Industry Association (TIA), the International Association of Chiefs of Police, several federal agencies, and radio manufacturers have all participated in creating this important standard. Project 25 ensures that all systems following this standard will meet its five main objectives: 1) to make efficient use of the limited number of available public safety frequencies; 2) to permit interoperability among other Project 25-compliant agencies; 3) to ensure backward compatibility of the network; 4) to create smooth system migration via upgrades, additions, etc.; and 5) to provide the capability for scalable trunked and conventional networks.

- **PTI** - In talkgroups, this indicates if the group is capable of Push To Talk ID. This option is usually only active if there is a console attached to the trunk system that could display the information.

- **PTT (Push to Talk)** - This term refers to the button on a radio that a user pushes to transmit. When somebody wants to talk on the radio, they depress the PTT on their portable radio, mobile radio, or dispatch console, and if there is an available frequency, they will be able to speak over the network. When a user presses the PTT, which is often referred to as "keying" the radio.

- **PVC (Private Call)** - This is a silent way for one mobile or control station to call another radio without other users being able to monitor the conversation or activity. The unit making the private call selects a switch position, presses his or her microphone and a signal is sent on the control channel to the destination radio. A special beeping is heard in the target radio, signaling that a private call has been initiated. To initiate a private call, the requesting unit must be equipped with one of several private call options.

- **Quantar** - Motorola trade name for their transmitter/receiver device. A Quantar is necessary for each pair of channels used for trunking at each radio site.

- **Queue** - When a radio user tries to make a call, and there are no available frequencies to transmit on, that user's call gets placed in a software queue. For the most part, the first user that gets placed into a queue will get to transmit, as soon as a frequency becomes available, and any subsequent users in the queue will transmit when their turn arrives.

- **Radio** - This term takes on multiple meanings when applied to a communications system. When the term radio is used, it can refer to any of the following: a

device used to transmit or receive audio; a base station at a transmit site that contains electronic equipment; electromagnetic waves in the air which carry a network's information; or any device used to receive and/or transmit information across a medium.

- **Rebanding** - Rebanding (also called Reconfiguration) refers to changes to the 800 MHz band plan that have taken place nationwide. This involves the relocation of operating frequencies to prevent interference between dissimilar operators.

- **Repeater** - A repeater is a piece of equipment that acts as a receiver and a re-transmitter. In a radio communications system, repeaters are used to extend the coverage of a wireless transmission. The repeater accomplishes this by first receiving a signal that has been transmitted from some other location, then amplifying and re-transmitting that signal from an antenna, thus giving the original transmission a boost.

- **R.F.** - Radio Frequency. For trunking systems, this is usually in the 800 MHz or 900 MHz band; however, there is movement of such systems into the 700 MHz band. The signals are carried through the air over these "R.F. carrier frequencies".

- **RIB** - Receiver Interface Board. This ties the repeater receivers to the Central Controller.

- **Selective (Radio) Inhibit** - An important feature to public safety users, which allows an operator to instantly and effectively "put to sleep" a mobile or portable unit in the field. Lost or stolen radios, over which sensitive communications could be heard, can be effectively silenced permanently by the operator. The target radio must be turned on and within system range in order for this feature to be effective.

- **Simplex Operation** - Simplex operation is radio operation directly among local user radios, from unit to unit(s), without employing intermediate trunked, or conventional, repeaters on towers or similar infrastructure. Simplex operation is sometimes referred to as "talk-around." Fire operations in a close area often refer to it as "fire ground channels." One major advantage of using simplex operation is the relieving of site repeater resources.

- **Simulcast** - A radio network that is simulcast transmits information from each of its transmission sites simultaneously. This means that when a radio user transmits from his/her radio, that transmission is rebroadcast from every tower or antenna that is part of the simulcast system. Because of this technique, any radio can pick up any transmission, regardless of its location.

- **Site** - Also called transmit site, cell site, radio site, or antenna site. Any radio network transmits and receives its signals through antennas that are placed strategically in different locations throughout their desired coverage area. These places are called sites. Usually, the antennas at these sites are mounted high

above ground on towers or on the sides of buildings. The PPRCN 800 MHz network utilizes 12 radio sites, and will soon include statewide sites throughout the Mutual Aid system.

- **Site Affiliation** - Trunking protocols require nearly continuous communications between the system and the user radio. During the time while no audio is coming from a trunked user radio's speaker, the radio's receiver section continually evaluates the signal quality of several other tower site control channels, and selects the site providing the best signal. This best-site selection process is referred to as site affiliation.

  When a user mobile or portable radio comes nearby to a repeater site, it may switch from a weaker site's control channel, where it was being directed, and become re-affiliated onto the network via the nearby site's stronger signal. If the signal quality is superior, the user radio starts using the new site's control channel. The central controller recognizes the user radio as being affiliated at the new site.

  The user radio will remain affiliated at the last best site until such time as another site can provide a clearly better signal. Should audio be coming from the radio, e.g., on a talkgroup call, its receiver cannot at that instant also be evaluating signal quality from various other site control channels. Site switching will only occur after several seconds of inactivity on selected and / or scanned talkgroups.

- **Site Availability** - Availability is a concept in a trunked radio system that describes the condition when there is at least one repeater available at that instant for assignment to a talkgroup call. When for a short time, no repeaters are available for assignment of additional talkgroup call requests, there exists a busy condition.

- **Site Controller** - Computer system located at the site which controls all system activity, channel assignments, logging, supports test and alarm unit, and communicates with the Zone Controller.

- **SmartZone** - Trunking system using multiple sites, with a variable number of repeaters. This is the system type that the PPRCN and CCNC are using.

- **Talk-Around** - Talk-around by-passes the repeater and talks directly to another unit. Units in the talk-around mode are operating in a conventional mode. See Simplex.

- **Talkgroup** - A talkgroup is a group of radio users that are linked to each other through the radio system. For instance, if any member of a talkgroup initiates a call, any member of that group will hear that transmission. The PPRCN 800 MHz incorporates many different talkgroups, and the users in these groups will be able to interact with the members of their own group, as well as monitor other talkgroups throughout the network.

- **Telematics** - The integrated use of telecommunications and informatics, also known as ICT (Information and Communications Technology). More specifically, it is the science of sending, receiving, and storing information via telecommunication devices. More narrowly, the term has evolved to refer to the use of such systems within vehicles, like OnStar, collecting roadway tolls, and recovering stolen vehicles.

- **TIA** - Telecommunications Industry Association

- **Traffic** - This term refers to the number of transmissions being made on the network, at any given moment. Although most networks are designed to function even when very busy, an excess of traffic on a network may cause some radios to be placed in a queue when trying to transmit. Comprehensive traffic projections were taken into account while designing the PPRCN 800 MHz network, and since this network provides radio coverage to public safety agencies, the standards have been raised much higher than that of commercial wireless providers.

- **Trunking** - This term refers to a type of communications system that draws from a pool of available frequencies, and assigns them only when they are needed. For example, in the 800 MHz trunked network, when a radio user wishes to talk over the air, they push their PTT button and the system dedicates a frequency to broadcast that user's transmission. After the user lets go of the PTT button, the system can reassign that same frequency to a completely different radio. Trunking is different from a conventional radio network, which assigns one dedicated frequency to a group of radios indefinitely. In a conventional system, if nobody in a particular group is transmitting, their assigned frequency sits unused and is essentially wasted. Trunking can be more efficient, since any available frequency can be used whenever it is needed.

- **Tunneling** - Like skip, this is when the atmosphere "flips" over and allows radio signals to travel long distances. This generally happens in the early morning hours as the sun comes up. The upper atmosphere warms before the ground air and this causes a "tunnel" where the signals bounce up and down close to the ground. This lets them travel long distances and then interfere with other trunk systems.

- **Vocoder** - This piece of equipment transforms the sound of a person's voice into a stream of digital information. It also reverses the process converting digital information back to voice. The vocoder is vital to the operation of a digital network, since without it, no audio transmissions could be sent or understood.

- **Yagi Antenna** - An antenna type that radiates in only a specific direction. Yagi antennas are used only in point-to-point situations.

- **Zone Controller** - In a Motorola SmartZone system, this is the 'brain', or controller, that commands all of the other controllers that are located at the individual sites.