

Broome County Interoperable Communications System



**Standardized Guide to Digital Radio Network
for all Broome County Public Service Agencies**

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Preface

For many decades Broome County has long been utilizing a myriad of many small and large radio systems over three bands of public safety and government radio spectrum to communicate emergency and day to day communications. In 2012 the Broome County Office Emergency Services (BCOES) commissioned a study from an independent consulting firm specializing in public safety radio systems design and engineering to review the many individual radio systems utilized by all the police, fire, emergency medical service and public works agencies within the county. This report overwhelmingly proved that Broome County needed a new system capable of interoperability, not just so that all these agencies could communicate in times of need but also within the individual disciplines. Together with BCOES the Fire Service, EMS Agencies, Highway Departments, and Police Agencies rallied together to encourage the county leadership to build a new radio system. After hiring a consultant, going out to bid and securing funding through 911 and cellular 911 surcharges, the County elected to sign a contract with Motorola Solutions to build its own, new, standalone UHF digitally trunked radio system. This system would be all-inclusive of agencies throughout the County allowing for universal interoperability utilizing APCO P25 standards amongst all county agencies as well as those from the State and Federal Governments.

Having the opportunity to start with a clean slate, a new standardized plan was created to govern the use and operation of the Broome County radio system. This plan includes the terms and conditions for emergency communications use, day-to-day use, and standards of conduct for utilizing this system.

Glossary of Terms

- Talk Group-** A “Talk Group” is an assigned logical group of users on a trunked radio system. Unlike a conventional radio which assigns a certain frequency, trunked systems use a number of frequencies allocated to the entire system. For example, “Transit”, “Endicott Police”, and “County Highway” are all talk groups on our system. Users are assigned different talk groups depending on who you wish to communicate with.
- Channel-** This term is used to identify the physical channel selector location of a talk group. For example, talk group “Emergency” is located in channel position 16 of every radio in the Broome County system.
- Subscriber** A portable, mobile or control station radio to be used on the digital trunked radio system. Each radio is programmed with a unique subscriber identifier. Only identifiers contained within the county system database are allowed to use the system.
- Trunking** Trunking is a technology for providing network access to multiple subscribers simultaneously by sharing a set of frequencies, instead of providing individual frequencies or channels for each client. Broome County’s new radio infrastructure shares ten channels among dozens of agencies and thousands of individual users.
- On Network-** On-Network identifies a talk group that is utilizing the county radio tower system. This is a non-direct system and any radio transmission made On-Network is retransmitted (repeated) from all county radio towers. On-Network talk groups can only be used when the radio is capable of reaching one of the County’s 16 radio tower sites.
- All On-Network talk groups are capable of being monitored and recorded by the 911 Communications Center (although not all talk groups will be monitored on a normal full-time basis).
- Off Network (TAC)-** The term TAC (tactical) identifies a talk group on the Broome County radio system that is Off-Network. This is a line-of-site method of communications that is direct from radio to radio and is not repeated. Tactical (TAC) talk groups can be used in county where an Off-Network talk group is needed or out of county when in close proximity to another Broome County radio user. These talk groups are denoted with the word “TAC” in the name as well as the letter “D” (Direct) at the end. Example: “Police TAC 7D”, “Airport TAC 2D”, “FlaggerTAC 10D”, “Event TAC 6D.”
- Examples: A Fire Department operating its Field Days, Binghamton Police conducting an operation in the basement of a downtown building where they would otherwise be unable to connect with the radio network, and a DPW/highway department directing traffic where all users are within a small geographical area and the network is not necessarily needed or the network cannot be reached.

TAC talk groups or channels should ONLY be used when On-Network talk groups are unavailable due to the inability to reach the network OR when communications with the network is not necessarily needed. Because the very nature of TAC talk groups is Off-Network, the 911 Communications Center cannot monitor or communicate on these talk groups. Users are encouraged to stay On-Network when possible however typical radio usage such as directing traffic is not a high priority usage necessitating network resources. Judgement should be used when deciding to use an Off Network TAC Channel. If in doubt or clarification is needed, please contact the radio system administrators for guidance.

Cell- Much like cellular telephone, the Broome County Radio System is made up of two “Cells.” While most county radio systems have only one cell, Broome County has a very diverse landscape made up of very tall hills and mountains as well as many deep valleys that traverse different directions. Because of this terrain it was necessary to build out sixteen radio towers and due to the difficulty of overlapping simulcast from all of these towers the engineering design made it necessary to split the county in order to reduce that overlap. To that end we have an East Cell made up of six towers and a West Cell made up of ten towers. The East and West Cells operate on different radio frequencies, however all Broome County radios can operate in both cells. Talk Groups are normally assigned to one cell or the other however there are also Countywide Talk Groups that operate in both cells. Not all talk groups are Countywide since they use double the normal resources as single-cell Talk Groups.

Zone- The term ZONE is used to identify a grouping of channels or talk groups programmed into the radio. Since portable radios only have 16 channel selector positions, more channels or talk groups must be grouped into additional zones. For example: channel 1 through 16 may be programmed into Zone 1, channels 17 through 32 may be programmed into Zone 2, channels 33 through 48 may be programmed into Zone 3, and so on. Specific channels or talk groups may also be programmed into multiple zones. To change Zones on a mobile radio, use the Zone Up or Zone Down button. To change Zones in a portable radio, use the two smaller side buttons (the top button being Zone Up, the bottom button is Zone Down).

Ops- The term OPS (Operations) identifies a talk group on the Broome County radio network that is On-Network. Every Law Enforcement agency has their own named Ops talk group to be used within their jurisdiction. Additionally, there is multiple shared talk groups for use by all agencies. Here is a list of DPW, Highway, Parks, Landfill, Transit Ops Talk Groups:

- * Barker DPW (Town of Barker Highway)
- * Bing City DPW/Strts (City of Binghamton DPW/Streets)
- * Bing City Parks (City of Binghamton Parks)
- * Bing City Water (City of Binghamton Water Dept)
- * Bing Tn Cnk DPW (Towns of Binghamton and Conklin Highway)
- * CheDicPDic DPW (Towns of Chenango and Dickinson/Village of Port Dickinson DPW)
- * ColeFent DPW (Towns of Colesville and Fenton Highway)

- * DeSaWiWi DPW (Towns of Sanford & Windsor Highway, V/Deposit & V/Windsor DPW)
- * Endicott DPW
- * Endicott Water
- * JC DPW (Johnson City DPW)
- * JC Water (Johnson City Water)
- * Kirkwood DPW
- * LisTriWPt DPW (Towns of Lisle and Triangle Highway & V/Whitney Point DPW)
- * Mai Nan DPW (Towns of Maine and Nanticoke Highway)
- * Union DPW (Town of Union Highway)
- * Union Parks
- * Union Refuse
- * Vestal DPW (Town of Vestal Highway)
- * Vestal Parks
- * Vestal Wtr Sew (Vestal Water & Sewer)
- * SolidWasteOps1 (BC Landfill)
- * SolidWasteOps2 (BC Landfill)
- * All Hwy Ops (All Highway/DPW common use Countywide)
- * County All (All Radio System Users-Countywide)
- * Emergency
- * Events (Several)
- * Emergency Management (Several)

DPW/Parks/Highway/Transit- These are an On-Network talk groups to be used for single agency or in some cases two to four municipal agency organizations for normal day-to-day communications. Public works, highway, parks, transit departments are assigned talk groups based on the number of users and operational factors. The 911 Communications Center has the ability but does not normally monitor these talk groups.

All Hwy Ops- This is a common On-Network talk group to be used for multi-agency operations. All DPW, highway, parks, agencies are able to use this for inter-agency operations. If a user needs to talk with a user from another agency for any reason, this is the common talk group you should use. The 911 Communications Center has the ability but does not normally monitor this talk group.

County All- This is an On-Network talk group programmed in all radios within the Broome County system and is to be used for inter-agency communications. This talk group is to be used whenever multi-discipline communications is necessary for major incidents or planned events. All users of the system will have this capability – Law Enforcement, Fire, EMS, DPW, Highway, Transit, Parks, Airport Operations. If for some reason a police officer needs to speak directly with a transit bus or a snowplow, this is the talk group to be used.

The 911 Communications Center will have the ability to communicate on this talk group however it will not necessarily be always monitored.

Emergency- This is an On-Network talk group programmed in all radios within the Broome County system. This talk group is programmed into channel position 16 of every radio. This is a **USER EMERGENCY** talk group for communications with the 911 Communications Center. It is the default talk group for emergency (orange) button activations and is the talk group of last resort for Mayday calls for all agencies. This talk group should be used by all users to report emergencies directly to the 911 Communications Center. Use of the Emergency talk group as a means for non-emergency transmissions is prohibited.

Events- These are On-Network and Off-Network talk groups used primarily for planned events. Examples are: Spiedie Fest, Dick's Sporting Goods Open, Bridge Run. While it is assumed that these talk groups will be used for all major events it is also possible to use these talk groups for smaller, local events. Permission to use these talk groups must be coordinated with system administration ahead of time. Events talk groups are programmed into ALL Broome County system radios.

Emergency Management- These are On-Network talk groups to be used for major disaster management operations within Broome County. Use of these talk groups are only when needed and by permission of Broome County Emergency Management. Emergency Management talk groups are programmed into ALL Broome County system radios.

Dynamic Regrouping- This is an On-Network function that the system administrators and 911 Communications Center can use to redirect a radio (or radios) to a specified talk group. This function may be used to link agencies together that do not otherwise have each other's talk groups. It may also be used during incidents such as emergency button activations where it is decided to move a Mayday to a different talk group, keeping the talk group available for other emergency traffic; in this situation the dispatcher may capture the radios of the person calling the Mayday and the people handling the Mayday and regroup them all to a different talk group. When a radio has been dynamically regrouped the push to talk tones will be different than normal and the radio will remain on the regrouped talk group until the dispatcher releases it. The decision to regroup will be made by the dispatch supervisor but may also be requested by the Incident Commander.

National Interoperability Channels

UCALL40/UCALL40D- This talk group is an Off Network, national interoperability talk group used by public safety and other agencies that operate inside and outside of Broome County for the purpose of requesting emergency incident related information and assistance as well as setup up tactical communications for specific events or incidents. In most cases, the calling party will be asked to move from the “calling” talk group to one of the tactical talk groups identified below. The “calling” talk group will be monitored by the 911 Communications Center. Also, Broome County users working outside of Broome County should be able to hail 911 Communications Centers where they are working on this talk group if assistance is needed. There is an effort by New York State to be sure that all counties in the state have this ability and most counties already have this ability.

UTAC41/42/43- These talk groups are Off Network, REPEATED channels for national interoperability tactical operations. Where UCALL is used to contact Dispatch Centers, UTACs are used for operational purposes. These are talk groups that may be used by Broome County users when operating outside of Broome County. At this time, Broome County does not have repeaters for UTAC purposes but some surrounding counties have them in operation. Where UTAC repeaters are not available, UTACD (Direct) talk groups are always available because they are direct, line-of-site communications.

UTAC41D/42D/43D- These talk groups are Off Network, DIRECT channels for national interoperability tactical operations. Where UCALL40D is used to contact Dispatch Centers, UTACs are used for operational purposes. These are direct talk groups that may be used by Broome County users when operating inside or outside of Broome County. Broome County 911 Communications has UTAC capability but does not monitor these talk groups. The 911 Communications Center only monitors the UCALL40D talk group.

General Radio System Overview

Broome County Office of Emergency Services has set forth the following protocols for all users to follow in order to help ensure the safety of all users on the radio network as well as to adhere with Federal Communications Commission rules and federal law.

1. **Ensure that all system users** (both field users and 911 Communications Center staff) **are familiar with and trained in the proper radio procedures designed for their assigned duties** when using the Broome County Interoperable Communications System.
2. **All communications regardless of nature shall be restricted to the minimum practical transmission time** and employ an efficient operating procedure. Transmissions of an excessive length on a trunked radio system can have the unintended consequence of busying the system for other users. All radios are set to “time-out” after 30 seconds.
3. **Assume everything you say on the Broome County Interoperable Communications System is recorded, admissible in a court of law and available under the Freedom of Information Law (FOIL).** Audit trails are generated for all network transmissions.
4. **Broome County uses the Incident Command System** and the 911 Communications Center Dispatchers rely on your use of it and the practice of a unified command.
5. **Pronounce words distinctly.**
6. **Attempt to make your voice a regular monotone.** The voice should be as emotionless as possible emotion tends to distort the voice and render it unintelligible.
7. **Radio messages require no expression, but a high degree of intelligibility.**
8. **When utilizing the radio system, use common sense and courtesy.**
9. **The FCC forbids profanity** (this is a violation of Federal Law Title 18) and any superfluous or extraneous transmissions.
10. Information that would jeopardize emergency and non-emergency operations or violate a victim’s privacy **if known by non-emergency service providers** shall not be transmitted over the radio.
11. **When a unit transmits on the user’s primary talk group, no talk group name needs to be transmitted.**

Example: “Truck 21 to Truck 63” is a typical transmission from a user to another user that

normally operates on the same talk group.

12. **When a user is not on his/her primary talk group, the names of agencies shall be transmitted in the calling format.**

Example: "Broome County 422 to Sanford Supervisor" is a typical transmission from a user to another user from a different agency or municipality.

13. **Previously used radio station call signs will no longer be used.** The Land Mobile Radio system has built in identifiers that are done automatically.

Examples: "KED639", "WDT328"

14. **Tactical (TAC) talk groups are used for operational communications between field users.** TAC talk groups are Off-Network (i.e. low power, simplex, line-of-site, non-repeated). On larger incidents, separate and unique TAC talk-groups may be assigned by the dispatch center for specific functions. **TAC talk groups should not be used if OPS talk groups are available AND all of the radios on scene are able to reach the county system. If the incident is in a known area where it may be possible that a radio might not reach the county system, TAC talk groups SHOULD be used.**

Agencies are STRONGLY encouraged to get out to all areas of your jurisdiction and **TEST** communications, especially in hard-to-penetrate buildings and basements so that any poor transmit and receive areas are known **before** an incident occurs. Testing may be done on your agency's talk group.

15. **The 911 Communications Center assigns additional talk groups/channels for planned or scheduled events.** Any event, known in advance that requires additional communications resources needs to be cleared through the 911 center.

1. Alternate talk groups will be assigned as available for the duration of the event upon request. Talk group assignment is subject to pre-emption if required for reassignment to an emergency event.
2. Alternate talk group assignments should be scheduled as far in advance as possible.
3. Agencies may be assigned On-Network operations talk groups or Off-Network TAC channels. The use of OPS/TAC talk groups/channels must be coordinated through the 911 Communications Center in order to prevent interference between multiple operations. Agencies may not always be aware of other events or incidents happening in other parts of the County.
4. Agencies requesting additional talk groups/channels will coordinate with the on-duty 911 Communications Supervisor for assignment and will let that person know if a specific talk group or TAC channel is needed. Consideration

will be given according to specific needs.

5. The 911 Communications Center will be notified by the requesting agency or incident commander when the requested talk group/channel is no longer needed.
16. **Use the “County All” talk group when calling the 911 dispatch center IF the dispatch center does not routinely monitor your primary talk group.** Always identify yourself with your agency name and either a unit number or your last name so that the dispatcher knows who to contact if more information is needed.
17. **Use the “Emergency” talk group to contact the 911 dispatch center for all emergencies.** Always identify yourself with your agency name and either a unit number or your last name so that the dispatcher knows who to contact if more information is needed.
18. **Phonetic Alphabet – A phonetic alphabet shall be used for spelling out names, license plate letters and so forth.** They are always transmitted as “Adam, “Boy,” or “Charles” not “A as in Adam,” etc. Due to the variations of phonetic alphabets, no one phonetic alphabet will be required. Any phonetic alphabet that clearly identifies a letter is acceptable.
19. **Plain language shall be used for all radio communications.** The use of codes, particularly agency specific codes have been found to be a barrier in the transmission of information. The most negative effect of codes is a reduction in communications interoperability during multi agency response. The National Incident Management System (NIMS) prohibits the use of codes.
20. **After pressing the Push-to-Talk (PTT) button, await the end of the “talk permit” tone before speaking.** The conclusion of the “talk permit” tone means that you have the air at that instant and can begin delivering your message. If another unit has the air, or the network is busy, you will receive a “system busy” tone. If you receive a “system busy” tone, release the PTT button and await a “talk permit” tone. The system will automatically give you the air once the air is available for your transmission. At this time you should press the PTT again and then speak. Do not continue to press the PTT button after receiving a “system busy” tone. By doing so you will lose your place in the queue and will be put to the end of the queue list.
21. **Think before you speak – DO NOT** press the Push-to-Talk button until you know what you want to say in your transmission.
22. **Make all transmissions brief and concise.** If you must transmit a great deal of information, break it into several shorter transmissions, the radio system will automatically end transmissions that are over thirty seconds long. Extended transmissions unnecessarily consume network resources and may result in other system users receiving a system busy.
23. **Don't use unnecessary words, such as "please" and "thank you".** These words waste

valuable air time on a public safety radio network.

24. **All transmissions should be impersonal and professional.** Do not use words or inflections that reflect humor, irritation, sarcasm, or disgust. Additionally, do not make “cat calls” or play music and/or sound effects over the radio. This activity violates Federal Communications Commission (FCC) rules and policies. Audit trails are generated for all network transmissions and all transmissions are recorded and subject to FOIL requests.
25. **Make only necessary transmissions.** You are sharing a limited number of radio frequencies with all other radio users including public safety and public service agencies. You do not know when emergency communications are in progress on other talk groups and your unnecessary transmission may delay another radio user reporting or responding to an emergency event.
26. **Don't ignore a call to your radio.** If you cannot deal with the transmission immediately, ask the caller to standby and re-contact them as soon as you are able to. If you have not heard all of a transmission to you, never guess at the missing information. Ask the person to repeat or clarify the message before acknowledging that you understand it.
27. **Emergency buttons (orange button) should be utilized only when the user is in immediate danger.** For MOST users when you activate your emergency button the radio will automatically change your talk group to the County Emergency talk group. Every attempt by the user should be made to relay a location and the nature of the problem. If the activation of the button was accidental do not switch talk groups or your channel selector to another talk group/channel. The Dispatcher shall inquire on your status and location and you need to respond with your location and status if there is no emergency. Any response other than no emergency will initiate dispatch of law enforcement to your last known location. Only reset your radio when the dispatcher tells you to. This is accomplished by holding the emergency/orange button down for 1-2 seconds. The user should hear a tone and once the tone occurs, key your radio on your primary talk group to assure your radio has reset.