BAA Boston Marathon
Amateur Radio Communications

Communications Standards

2024

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Foreword

Success is Led by the Power of Communications
- anon

In a world filled with every imaginable method of communication, we still seem to lack basic understanding. Perhaps this accounts for the use of a technique called "mirroring", an intentionally applied practice where a person with whom we are speaking tells us what they heard us say. This simple exercise reveals how easy it is to misinterpret face-to-face communication, even with all the available cues like body language, intonation, situation and intent present. Imagine then how a simple message, sent over a single radio channel, cluttered with noise and fading signals, coupled with situational stress, can be transformed into an unintentioned disaster! I liken our radio systems to the experience of listening to a full orchestra play Vivaldi as music on hold. After all the companding, digitizing, conversions and filtering, the music is barely recognizable, and presented in a 2.5 KHz bandwidth.

In the years since we first tackled the task of fashioning these Communications Standards, a greater understanding and appreciation for this specialized avocation has developed. Methods of the past were not discarded, but examined for their applicability. We asked questions such as, "Should we continue using secret radio community phrases like 'QSL' and 'QTH', or instead insist on plain language?"... "What is the best order in which to establish communications?"... and, "Should we always run a 'closed' NET?". If you've been an Amateur Radio licensee for a long time, perhaps you take these questions for granted, and simply do things the old way because, you argue, "they work, don't they?". Well, actually, we found that many of the techniques don't work, and for a variety of reasons. For example, plain language is a universal Public Safety standard. Can we effectively integrate others into our secret world of Q signals? Not likely. We also discovered that variables such as quality of our technology, the skill sets of field and "control" operators, and our collective comprehension of the mission and its unique language all play a huge part in doing it right. That last - comprehension of the mission - is so important, for we find that in order to be successful communicators we need to understand what it is that's being communicated first!

These Standards serve as a compensatory mechanism for the inherent weakness of our technology and various levels of personal skill. Positive identification, readbacks, key phrases, and moving away from the antiquated "NET Control" concept, have brought measurable improvement in the accuracy and efficiency of our work.

What you have in your hand today is, we believe, a useful collection of principles, techniques and a set way of messaging which will bring professionalism, accuracy and clarity to the communications craft. You are invited to apply these, and to adapt and improve upon them, too. Although fashioned for the Boston Marathon, they can be applied elsewhere!

Success is led by the power of communications. The Standards in this document will help make you and your teams more successful in this unique craft and become true communications professionals!

/2024 BAA Communications Committee

Scope and Purpose

This document presents the communication procedures and vocabulary common to all segments of the Boston Marathon's Amateur Radio support operation. It also explains the purposes and rationale behind them.

The individual Communication Plans for the event's segment organizations (defined below) supplement this document with procedures and reference information unique to each segment.

Race day conditions may occasionally require further adaptations beyond the documented plans, to meet mission goals.

Audience

All volunteers using radio communication systems, both on the air and in administrative and management roles, are encouraged to become fully familiar with this document and apply its principles.

The procedures and examples are written as the field station operators would apply them. (Most radio volunteers are field operators.) Operators at NET Control Operations Centers perform the complementary role, which should be clear enough from the text and the examples.

Documentation Comments and Errata

Please direct your documentation comments and error information to: Lela Smith: kc1acv@hamradioboston.org

Terminology

Before continuing, some definitions are helpful for clarity. These terms appear in various documents, frequently capitalized to mark them as having formal definitions.

Term	Definition
AR	Amateur Radio.
ARO (OPERATOR)	Amateur Radio operator / communications volunteer.
CLIENT	Any of the people and organizations managing the event (along with Public Safety), that we support with communication services.
post	A place where client personnel and their supporting radio operators work together. A post can be stationary or moving.
SEGMENT	One of the four major branches of the Marathon organization, and of the Amateur Radio support organization. The segments are START, COURSE, FINISH and TRANSPORTATION.
MEMA	Massachusetts Emergency Management Agency. The lead agency which assists in the coordination of Boston Marathon Public Safety on the Course, exclusive of START and FINISH.
UCC	Unified Command Center. A Public Safety command post which serves to integrate all command and communications resources into a single unit. The UCC has an Amateur Radio representative present.
NCOC	Amateur Radio NET Control Operations Center. There are three sites, one each for the START, COURSE, and FINISH segments. TRANSPORTATION is located in the COURSE NCOC. Each is staffed by client Officials, operators at radio positions, and various support personnel. NCOCs are linked through several Intertie channels as well as telephone and Internet.

FIELD STATION	All other Amateur Radio positions.
NCO	NET Control operator, an on-the-air radio operator in an NCOC, typically one of several covering different NET channels. Op Note: The term "NET Control" is a historical misnomer, left over from the days when the event operated as a controlled net. Today, an NCO is there to communicate on behalf of the client staff at the post. It would be more descriptive to think of the position as a "NET Center operator." They do not control the transmissions of other stations except in very special circumstances, and, of course, do not manage the event itself.
Field Station operator	The operator(s) at any field station.
Net	A collection of stations assigned to maintain a strict listening watch on the same channel. NET is also the Tactical ID of an NCO position.
NET channel	The assigned channel where the stations in a net listen for calls from one another.
Local channel	Any channel other than a NET channel (example, a "Tactical" or "talk-around" channel).
Tactical ID	Also often called "Tactical Call sign". It is the assigned identification we will use during the event to call other stations and identify our own. Op Note: Tactical IDs are assigned to the various posts, not to the operators. They describe the client functions they support. A reassigned operator leaves the Tactical ID behind at the old post and takes up a new one upon arrival at a new post. New Tactical IDs may also be created as the needs require. All Tactical IDs are assigned and administered by your Segment Coordinator through the NCO.
CTL	Communications Team Leader. The AR operator designated as lead at a field post staffed by more than one operator. Op Note: The CTL is the first point of contact for a field operator in the chain of command.
Segment Coordinator	The Segment Coordinator is responsible for all Amateur Radio communications volunteers for the segment, and the creation and execution of the Segment Communications Plan.
PROCEDURES	An operational role within each NCOC. PROCEDURES takes charge of and acts upon requests which arrive through a NET or other path/s. This Controller is an essential element as it allows NCOs to maintain a continuous and strict listening watch.
ACTIVATED or OPEN	The clients at the post are ready to perform their function. Op Note: Some clients prefer one term, some prefer the other.
DEACTIVATED or CLOSED	The clients have discontinued their function.
Check in	Operator announces the start of a continuous listening watch on the NET channel.
Check out	Operator announces the termination of a listening watch.
In position	At the assigned location.
Toward Hopkinton or Toward Start or Up Field	Marathon-specific: Expressing a **direction of movement**, toward the Start Line.

Toward Boston or Toward Finish or Down Field	Marathon-specific: Expressing a **direction of movement**, toward the Finish Line.
Left and Right	Expressing which side of the course, as seen by a runner moving in the natural direction toward Finish.
CLOSED NET	Where communications between stations are controlled by the NCO. All stations must ask for permission to call other stations. (see HYBRID NET)
HYBRID NET	Where communications between stations are NOT controlled by the NCO. Stations may call others directly without permission, provided the channel is clear. The NCO always has priority in this format. (see CLOSED NET)

Decisions and Direction Policy

General policy and how Amateur Radio fits into the larger event organization is covered in the document *Decisions and Direction Policy*. All AR volunteers should familiarize themselves with it.

In a nutshell:

- We provide communication services to support the clients. The BAA and the Public Safety agencies make all the decisions on running the event. We make decisions only about radio operation and management to support our mission expectations and objectives.

Operational Security (Op-Sec)

By the nature of the amateur radio service, our communications are not private. Considering the kind of information we will be transmitting, it's prudent to exercise some care as to what we reveal on the air. Your Segment Communications Plan may provide more guidance on this topic.

Things not to say on the air

- **Names**: To comply with Medical Confidentiality laws (HIPAA), don't transmit personal identifying information. This means no names, addresses, phone numbers, email addresses, etc.
  Identify a patient ONLY by the runner's BIB number, NEVER their name, in an Ambulance Request or patient destination report.
  Only a Medical staff member can order an exception.

  OP Note: At the Boston Marathon *a single exception* to this rule exists:
  PROFESSIONAL runners do not have BIB numbers. Instead they are identified on the bib by name. Therefore you may, per the directive from Mr Blair Sutherland, Medical Coordinator, identify the runner by BIB Name along with the basics of their emergent medical condition.

- Don't say actual frequencies or access tones. Use channel names.

- Don't mention the locations or proper names of NCOCs, other critical facilities, or your own post.

- Use discretion and good judgment in the unlikely event you find it necessary to hand off your microphone to a client. Exercise adequate supervision if you do. Profanity or other prohibited speech could expose you to liability and are wholly unprofessional.

  On Amateur channels you're also responsible for any necessary station identification before and after the client speaks.

Operating principles

A large Public Service job is different in important ways from other typical Amateur Radio operations, such as "rag-chewing", contesting, and traffic-handling nets. The most important difference here is that we can't control the pace of communication. We must keep up with events as they happen in the real world. To be truly on top of the game, we must anticipate and keep ahead of them.

Most of the information we will pass is extremely time-sensitive, and some of it safety-related. There are periods when the channel gets very busy and air time becomes a limited and precious resource.

Nevertheless, it's essential that all our operators be able to get air time at the moment they need it. To accomplish that, we must use air time efficiently. We must communicate both clearly and quickly, and release the channel for the next call. This requires cooperation and self-discipline.

Key ideas:

- Organize your information and plan your words before calling. If there's an applicable form, use it. Otherwise, use your notebook.
- *First* get ready to copy the response, *then* call.
- Say enough to express the intended meaning unambiguously.
- Say only the words that carry the information.
- Use context and standardized formats intelligently, to minimize the need for keywords and complete sentences.
- Use Tactical IDs (examples below) to identify who is speaking and who is addressed.
- Make use of the procedural meanings attached to the transmission of Tactical IDs and FCC call signs (explained in the basic procedure) so as to reduce the need for repetitive and unnecessary keywords and phrases.
- Answer calls immediately, and be ready to copy.
- Use plain english, *never* code-words or abbreviations (QSL, QTH, 10-4, etc.)
- *Don't hold up the flow. Release the channel if you're not ready to communicate.*
- Don't ask someone to stand by if you're not ready to continue with the message quickly. 30 seconds may be an eternity in the marathon communications environment.

How to be an Effective Communicator

1. Maintain a strict Listening Watch

At every post, there must be at least one operator monitoring the net channel(s) during the whole time the post is in service. That operator should be visible and immediately accessible to the Supervisor/Captain. Organize your equipment and your relationship with your client so that you can maintain your listening watch. *If you're not ready to answer a call promptly, you're not serving your client. Scarce air time will be wasted waiting for an answer that doesn't come.*

> OP Note: If you don't maintain a strict listening watch, you can't be reached when a call comes in. If you can't be reached your post is, in practical terms, out of service. Your listening watch is a vital link. Maintain it!

Listen to exchanges between other stations on the NET and develop a situational awareness. It should not be necessary for another station to tell you something that has already been said (unless you need further clarity). Pass on anything of interest to your client. As you gain more experience you'll learn what's of value.

Conversations with your client or the public will be necessary at times, but you should keep them brief. You may need to hold up a hand and point to your ear when there's something on the NET that you need to hear. Explain this in advance, so it's not misunderstood as rudeness.

If possible, lock your radio controls so they stay on your NET channel. If you don't hear anything for a while, check the display. If in doubt, ask NCOC for a signal report using the standard COMM CHECK request.

Field posts tend to be loud. A noise-blocking headset or a speaker-mic can be very helpful. Lacking that, a simple cargo strap strung over your shoulder and secured with a turn around your belt can support your HT up close to your ear. This position also raises your antenna, an aid in marginal coverage areas.

A spare radio is useful for monitoring an additional NET for situational awareness, for communicating with another station or operator on a local channel without contending for time on the NET channel, or just for backup in case of equipment problems.

2. **Plan before calling**

First, gather and organize the information your client wants you to communicate, or whatever report or request you intend to originate yourself.

If it's information that must be delivered exactly, such as runner numbers or Supply Requisitions, write it down on the appropriate form. If there is no applicable form or you don't have one, use your notebook. If possible, have the client check it before you call.

The client directing you to send or request information is the final authority on content and destination (not to be confused with message routing). If anything looks unclear or ambiguous, ask questions. Make sure you fully understand the client's needs. (You may not necessarily comprehend why, but that's OK.) If appropriate, identify the authorizing Official by name or title in your radio traffic.

3. **Brevity**

Choose your words to make the meaning clear with no unnecessary wordage. Brevity is vital. However, when in doubt a few extra words are better than too few.

Please avoid unnecessary fillers such as "be advised" and "at this time." "Be advised" is unnecessary because advising is what you're doing. "At this time" is obvious. And please avoid future tense when reporting present facts. "The bib number is going to be" raises the question "when is it going to be?" "BIB number 1234" is quick and says it all. These expressions and others like them may sound cool, but they burn up scarce air time and offer nothing new. Every second counts.

Use good judgment as to when your traffic needs extra emphasis. When you do, use plain English: (example) "From the Station Captain: We need the assistance right now. I say again, right now."

Keep individual transmissions short, to give the receiving operator a chance to ask for fills. This also allows a station with URGENT traffic to break in. When transmitting long lists, un-key periodically preceded with the phrase MORE TO FOLLOW. The receiving operator will likely acknowledge when caught up and ready to resume copying.

4. **Clarity**

Speak clearly, at a pace that allows the receiving operator to keep up, particularly when passing information that must be transcribed verbatim.

Don't shout or whisper, always speak at the level and mic position where your HT works best. Test with the NCO at Check-in time if you need to.

Clarity also means using ordinary English words. Q signals, 10-codes, and in-group jargon **are out**, even among Public Safety Agencies nowadays. On a voice channel, it's at least as quick to say "Where are you?" or "I'm at," than QTH. Any listener unfamiliar with our tribal vocabulary will understand plain language -- being understood is a key goal. Where we do formally define keywords or phrases for this job, they're short words in common English.

Phonetics carry a brevity penalty, so use them if and when you need to, not out of habit or just to sound formal and "official." As with everything else in radio procedure, use your experience and common sense.

5. **Accuracy**

If you're receiving anything but a routine Status Report, write it down as you receive it. Don't hesitate to ask for a fill or a repeat if you're not certain of what you heard. If it's critical information, read it back. If you need positive confirmation that your traffic was received verbatim and understood, request a READ BACK.

Medical or Public Safety traffic is critical information. Write down what you're told to send, get it checked if the client can give you a moment to do it, transmit it verbatim, and get a readback.

6. **Efficiency**

- When you call, be ready to transmit your information with no wasted time. Don't ramble or still be searching for words when your finger is on the button. Be ready to copy the response.

- When you answer, you're signaling the other operator that you're ready to copy. Be ready.

- Don't repeat anything unless the receiving operator asks you to.

- Don't repeat back things said to you, unless it's critical information that must be checked for accuracy -- or the transmitting operator requests a READ BACK.

- Don't say things you already said earlier.

- Don't say things the operator you're addressing already knows. *Just be realistic about what to expect them to know!*

- Use good judgment as to when it's worthwhile to spell out something with phonetics.

- This is VHF/UHF FM, much of it on repeaters, and everybody is maintaining a strict listening watch. Don't repeat another station's transmission unless you're reasonably certain the operator you're addressing missed it. This would happen only in the unlikely case of simplex relay.

- *Get the communicating done, and release the channel for the next call.*
  Don't ask other stations to "Stand By" except in rare and unusual circumstances. Let go of the channel and call back when you're ready to resume communicating.

Your channel is a valuable resource. Use it wisely to avoid the necessity to invoke the time-consuming overhead of a Directed net.

The Radio Procedure Model (RPM)

The communication procedures in this section are built upon the concept of an exchange of transmissions between two stations, analogous to a telephone call.

Two subsets of the RPM are presented below: the Full Exchange and the Rapid Exchange. (Appendix E describes an optional variant of the Rapid Exchange, using some additional time-saving techniques cribbed from other services that handle extremely time-sensitive information. It's best suited to excellent communication conditions with no noise or other interference.)

The Full Exchange is often used where communications are marginal, and always when critical information must be copied verbatim with high confidence.

The Rapid Exchange is usually more efficient for Dispatch Operations such as those found in the TRANSPORT segment, for routine status inquiries and reports, or where communication conditions are excellent and redundancy isn't needed.

The key difference is that in the full exchange the information payload is not transmitted until the initial call is answered.

Basic Procedure -- Full Exchange

The Full Exchange is optimized for assured accuracy, at the cost of slightly more procedural overhead. It has four phases:

- Call
- Answer
- Communication
- Ending

Call

- To call another station, transmit the other station's Tactical ID followed by your own.
  Field stations only: end the calling sequence with the keyword ON and the ID of the channel or system you're using. (NCOs may be guarding several systems or channels simultaneously. If they are, they'll tell you.) This is especially important if you're not calling on your assigned NET channel, where other stations expect to hear you.

- You may attach up to 5 words of communication to the call, if it doesn't need to be copied exactly. This is a good way to announce the subject of the call. It lets the other operator know what form to reach for before answering. (The receiving operator might not always catch it, but usually will. On average it saves more time than the occasional request for a repeat consumes.)

- **If the call isn't answered within 5 seconds, the call expires and the channel is free for the next call.**

Answer

- Answer a call by transmitting your Tactical ID followed by "ANSWERING" and the Tactical ID of the calling station. Answering means that you are ready to copy.

- The NCOC will reply by transmitting NET ANSWERING [your Tactical ID].

- There is no wordage limit on communications attached to an answer. (The caller is expecting a response, and is supposed to be ready to copy.)

Op Note: Using the keyword ANSWERING may seem obvious and superfluous, but even in the best communications environments, such as those found in Public Safety, it is frequently used. Sometimes we need to state the obvious, simply to make absolutely certain our intent is understood. In the noisy, often marginal comms environment found at the Marathon, this simple addition will reduce confusion and thereby improve reliability and efficiency. Try it. We think you'll like it.

Communication

Communication consists of questions, information, and acknowledgments.

- To reduce the risk of confusion and the potential that a message for one station may be interpreted to be for another, *begin every transmission* with your Tactical ID.

- The NCO will begin each transmission with *your* Tactical ID.

- Wait for the answer before transmitting critical information, or anything that must be copied exactly.

- After your Tactical ID in each transmission, transmit just the words and numbers that express the information or the question. Include keywords if you consider them necessary to make the intent clear, otherwise don't. Use common sense about this.

- Read back critical information.

- Keep individual transmissions short -- 10 seconds or less. Wait for the acknowledgement before resuming.

- If the other operator pauses while transmitting to you, acknowledge as soon as you catch up copying. Acknowledging is the signal to the other operator to resume transmitting.

- If you can't immediately answer a question or provide requested information, say you'll call back. Don't hold onto the NET channel if you can't communicate immediately.

Ending

*For **Amateur Radio**:* The FCC requires an AR station to identify with its official call sign "at the end of an exchange of transmissions." Therefore, we make that the signal that the exchange is ended. No keyword is needed.

(The calling operator knows the purpose of the exchange, and therefore knows when it's completed.)

- Transmit your FCC call sign to end the exchange and release the channel.

- If NCOC is the caller, NCOC will transmit its FCC call sign to signal the end. The field station must then transmit its FCC call sign to meet the FCC rule.

- If the call was between field stations, the caller identifies first, then the answering station.

Op note: If you miss transmitting your FCC call sign because the channel is busy and the end of the exchange is obvious by context, remember to identify within 10 minutes.

An NCO should NOT end each exchange with "This is W1M, NET Control for the 2023 Boston Marathon", or other long-winded identifiers. This wastes valuable time. Simply say "W1M." We all know it's the 2023 Boston Marathon, and we also know you're a NET Controller. Do heed the FCC rule which requires transmission of your personal Call sign every 60 minutes.
NCOs are also encouraged to note the time at the end of a general announcement: "W1M at 13:45".
[Don't say "13:45 hours". "Hours" is unnecessary excess verbiage that wastes time.]

For non-AR volunteers using Commercial Radio: Use your Tactical ID followed by the keyword CLEAR to signal the end of the exchange. This word means "I'm done using the NET channel. Others may call now."

Basic Procedure -- Rapid Exchange

The Rapid Exchange is essentially the same as the Full Exchange except that brief communication is included in the Call phase. The information or question should fit within the 5-word limit of the call. The response fits within the answer.

This is a very common situation for routine Status Reports, observations and simple instructions. The rapid exchange saves a great deal of time. Common examples:

- Checking into and out of the net.
- Reporting post activation and deactivation.
- COMM CHECK requesting a signal report.
- Reporting a status or event when requested, such as the passage of the first runner.
- Routine Dispatch "only on request".

  Op note: You may also ask for a READBACK to have assurance that your information was properly received.

Call

- Call as above.
- Immediately after the Tactical IDs, include the communication content: the information, question, or request.

Answer

- Answer as above.
- If the call requires a response other than a bare acknowledgement, follow the Tactical IDs with the requested information.

Ending

- End the exchange as above.

NET Procedure Examples

Full Exchange, NCO is the caller

Station Speaking	Transmission	Illustrates These Procedure Rules
NCOC	HOTEL ONE NINER RIGHT, NET.	To CALL, transmit the other station's Tactical ID, then your own.
H19R	HOTEL ONE NINER RIGHT ANSWERING NET.	This illustrates the long-form ANSWER. It unambiguously identifies who is answering and who is being answered, and is recommended if communication quality is questionable.
NCOC	HOTEL ONE NINER RIGHT, can you move to Hotel One Seven Right?	NCOC begins each transmission with the Tactical ID of the station being addressed.

H19R	HOTEL ONE NINER RIGHT, affirmative, if I can get there before the first runner. I'd have to drive up-course.	Begin each transmission with *your* Tactical ID.
NCOC	HOTEL ONE NINER RIGHT, first runner is about twenty minutes away.	
H19R	HOTEL ONE NINER RIGHT, understand. will do. Moving in five minutes.	
NCOC	W1M, 0945.	To END the exchange, the caller transmits their FCC Call sign. NCOs are encouraged to say the time occasionally. This is helpful for situational awareness and logging.
H19R	N1ABC	Field station must transmit FCC Call sign to stay legal. channel is released for the next call.

Rapid Exchange, Field Station is the caller

Station Speaking	Transmission	Illustrates These Procedure Rules
M18A	NET, MIKE ONE EIGHT ALFA ON ROMEO THREE. post activated.	When calling your NCO state the calling channel or system name you are using, especially if not on the assigned NET channel where the NCO expects to hear you. Up to 5 words of communication are included with the call.
NCOC	MIKE ONE EIGHT ALFA, NET, ACKNOWLEDGED.	Return communication is attached to the answer; in this case, an acknowledgment.
M18A	KA1DEF	Field station's FCC Call sign ends the exchange.
NCOC	W1M	Optional, and generally not required when NCOC is the answering station.

Rapid Exchange, NCOC is the caller

Station Speaking	Transmission	Illustrates These Procedure Rules
NCOC	MIKE ONE EIGHT ALFA, NET. Bus ETA two minutes, ACKNOWLEDGE.	5 words of communication are attached to the call. If you are maintaining a strict listening watch, you'll get the message the first time.
M18A	NET, MIKE ONE EIGHT ALFA, ACKNOWLEDGED.	Return communication is attached to the answer; in this case, an acknowledgment.
NCOC	W1M	Caller's FCC Call sign ends the exchange.
M18A	KA1DEF	Field station must transmit FCC Call sign to stay legal.

Authenticating the Authority for a Command or Request

An essential part of our communication service is relaying messages, commands, and requests from the BAA and their Partners. A request from your NCO to "**Move the tent to the west side of the street and hold for further instructions**" should, even in a circumstance where this is consistent with the situation at hand, raise your curiosity and produce a reply, "**NET, MIKE 23 BRAVO, SAY issuing authority**."

Communication volunteers on both ends of the radio link should therefore preface commands, requests, or any traffic where including the originating authority seems prudent, with the originator by name or title. If at all possible write down all such messages and transmit verbatim.

Example:

MIKE 23, NET. FROM INCIDENT COMMANDER, MOVE YOUR TENT TO THE WEST SIDE OF THE STREET AND HOLD FOR FURTHER INSTRUCTIONS. READ BACK.

This command leaves no doubt as to the command's originator.

More on FCC Call Signs

Amateur Radio **only**: The FCC rule is that a station must identify at the completion of an exchange, or no less than every 10 minutes during an ongoing series of transmissions. Since field stations typically go long periods without transmitting, and transmit for only a few seconds, identifying at the end is the efficient way to meet the requirement. NCOs, on the other hand, will consume much less air time on average by identifying every 10 minutes, rather than by identifying at the end of every exchange.

Each NCO, on each channel under their listening watch, will use the Special Event Call sign W1M. The rule for Special Event Call signs requires transmitting the operator's personal FCC Call sign once an hour. NCOs should refer to the NCOC procedures documentation for details.

Note that your Tactical ID takes effect when you arrive at your post, and stays behind when you leave. It remains active if you're on duty and only temporarily away. Therefore, if you don't currently have an assignment, or you haven't yet arrived at your post, your FCC Call sign is your only ID. Your NCO will understand when you use it to call or answer.

More on acknowledging

We list ACKNOWLEDGED as the preferred keyword. ROGER is also a common keyword that most of you will immediately recognize as an acknowledgment, and which has no ambiguity (except when conversing with someone named Roger, which is why it's not otherwise mentioned). Both are perfectly fine to use. Just remember that consistently following this event's Standards makes us all look and sound great.

Never use OKAY, GOT IT, RECEIVED, QSL, 10-4, or similar language to acknowledge a transmission! Most of those can have other meanings than "acknowledged." OKAY is especially susceptible to misinterpretation. What we can't afford is ambiguity or misunderstanding.

Precedence Levels

The term Precedence comes from age-old message handling protocol. The purpose is to identify which traffic has to move first. Precedence influences NET protocol and message handling. In our standards there are three levels: Routine (the default state), URGENT, and Emergency.

- **Routine** - NET housekeeping such as checking in, checking out, setting up contact on a local channel, requesting a COMM CHECK, etc. Some client communication such as Hourly Status Reports and Supply Requisitions may be routine.
- **URGENT** - (formerly Priority) most communication on behalf of a client concerning real-world events, including all Medical Requests.
- **Emergency** - Communication concerning immediate danger to life, if not already handled through EMS or Public Safety Systems.

In general, we won't need to use these words on the air, because the precedence is almost always obvious from context. Most traffic that falls into the URGENT category is handled in the normal hybrid NET mode. Because our standard procedure is designed to maximize efficiency and keep the channel open for calls, it will rarely be necessary to explicitly declare URGENT and interrupt an exchange in progress. If you do have something that is important and more time-sensitive than what's in progress, say **URGENT** twice and your Tactical ID. NCOC will immediately answer. Never use BREAK for this purpose. (See the BREAK keyword if you are unfamiliar with its use.)

We don't use the word PRIORITY at all, unless directed to by Medical authorities. That word has specific meaning to the Medical services.

EMERGENCY may be declared on the air when the situation is really major, at the level of a Course disruption (example: the 2013 bombing) where loss of life is imminent. We note that EMERGENCY is not commonly used in Public Safety settings. To remain consistent and to be interoperable and integrated with these and other Partners, we reserve this word for only the most extreme circumstances and ONLY on our NETS.

NET Management, Discipline, and Permissions

The NCOCs Tactical Call sign is NET, _not NET CONTROL_. The NCOs are the individual radio operators serving the client Officials at the NET Control Operation Center (NCOC). They don't intervene to control the NET itself except in unusual circumstances. Marathon operations have largely moved away from the controlled-NET concept, because this back-and-forth wastes air time.

We now maintain order on the NET channel through written procedures crafted for efficiency, and the self-discipline of our talented and experienced radio communications volunteers. Consistent application of

the standard procedures described here and in your segment's Communication Plan will aid in smooth and rapid interactions. It will deliver efficiency and professionalism.

Normal "Hybrid' mode

The NETS will normally operate in a Hybrid mode; in other words, the NET is non-directed (with one exception noted below). This method greatly reduces procedural overhead, and leaves more air time free for useful communication. (The Hybrid NET format is further described in the *NET Control Operations Center Communications Plan*).

- The *only* thing that requires NCO permission is interrupting your post's listening watch on the NET channel. Even a brief interruption requires permission.
  Permission might be delayed if an announcement or general order is about to go out on the NET.
  If the NCO allows you to leave the NET channel, they need to know where to find you and whether you're reachable through other means.

Otherwise:

- If you need to call another field station, just do it when the channel is free. As always, keep it brief.

- As explained above, a post must have at least one operator at all times physically present and listening to the NET channel. Subject to that, operators at a multi-operator post may manage their duties, relief breaks, and use of local channels among themselves as they see fit.
  Similarly, if you want to talk to another station on a local channel using a second radio, you don't need NCO permission - just maintain your **primary** listening watch!
  Don't expend NET channel time on matters that are within your own discretion.

- If you need extended talk time with a field station, establish contact and change to a free channel (if available) using the SWITCH AND ANSWER keyphrase sequence.

- If you are the field station who was asked to SWITCH AND ANSWER, and by switching you will lose your listening watch on the net, request NCO permission before proceeding.

- If you absolutely have to hand the radio to a client (to be avoided if at all possible), set up the contact on a local channel if at all possible. A client is likely to need a lot more air time than we can afford on the NET channel.

- Interrupting an exchange in progress with the keyword URGENT -- you don't need permission for this, obviously, but use good judgment. Do it only when absolutely necessary, and if possible do it when the channel is free. Your NCO will answer and give you the channel.

Issuing NET instructions -- an NCO might occasionally remind other operators of efficient procedure if necessary, and if it will save more time than it consumes. Otherwise, we don't intend to be picky about little things. (But don't be surprised if, in reply to "Permission to call MIKE 03", you hear, "No permission needed, this is a Hybrid NET. Refer to published procedures. MIKE 03, please answer the caller. W1M."

Special situations: "Directed" mode

If an abnormal situation such as a Course disruption occurs, requiring Command transfer to Public Safety Authorities, the Segment Coordinator will likely order one or more NETS to change to Directed mode, at least at the beginning of the situation. In Directed mode a field station requires permission from the NCO to call other field stations. At the start of such a situation, the field stations may be directed to stop transmitting and stand by to copy general announcements or orders. Field operators may be asked to perform other unusual actions, such as allowing the Station Supervisor to hear any messages directly.

On Arrival at your post

- Upon arrival at your assignment and again when ready to begin your listening watch, report your status to your NCO.

- Introduce yourself to your Communication Team Leader and your client. Ask to be briefed on their specific communication needs. Tell them the capabilities your NET offers, and the resources reachable through NCOC. (Some of them will know more about this than others.)

- Arrange your outer clothing and your gear around your body the way you want it. Ask your CTL or Captain where to stow anything you don't intend to carry around all day. (Note, there may not be a secure place to stow your gear, so plan ahead accordingly).

Op Note: Unlike our NET procedure, start out by asking permission from your CTL or Captain for everything. A little initial deference and respect will win you a prized relationship with your client and team. Convey the message that you are in service to them, not the other way around!

- Once you check in with the NCO a listening watch begins. Maintain it at all costs!

Leaving your post

Yes, you're a volunteer, but at the Marathon you are not necessarily a free agent. Your movements and activities are governed by the expectations of your assignment and those of your CTL, Station Captain, or other authority. Within a secure environment at the marathon, an unexplained absence from your post may trigger an inquiry from Police or other Security Authorities.

Physically leaving your post falls under the discretion of your CTL or Station Captain. You should make it known before going out of sight, especially if you're the only operator assigned (porta-potty breaks, etc.).

Never bother the NET with this information as long as you are able to maintain your listening watch. Maintaining your listening watch whether you're on post or not is the expected norm.

Never leave the post unstaffed, until it deactivates. Check out with your NCO before departing, since you may be reassigned to a new post.

Deviating from Plan

A well-thought-out plan saves us from having to figure out everything on the fly. Still, no plan can cover all possibilities. Our Communications Standards recognize that reality.

If a situation arises that isn't covered, AR operators will need to apply their experience and judgment. Deviate from the written Standards and Communication Plan if necessary, but *no more* than necessary. If at all possible, avoid doing things that confuse the other operators on the channel, or the clients at your post.

The key is to serve the client by ***communicating***, when not doing so will lead to difficulty or inefficiency.

An operator in the Public Service environment gains skills through experience and judgment. If you're not sure, ask.

Appendix A

Keywords and Standard Phrases

It's useful to standardize certain words and phrases for use on the air. This will speed and clarify communication. Study them and then use them when appropriate in your work. They'll give us a more efficient and professional-sounding NET.

Keyword	Meaning
URGENT	Important, time-critical material. Pause exchange in progress. NCO or station called will answer. All other stations will stand by until the URGENT traffic is passed. Op Note: All EMS Requests are URGENT, even if you don't use this keyword.
EMERGENCY	Life-threatening immediate situation. Pause exchange in progress. NCO or station called will answer. All other stations stand by. Op Note: Only a life-threatening situation, such as that of the 2013 Marathon bombing, qualifies for the EMERGENCY keyword.
INFO	Caller has information concerning exchange in progress or previous request.
COMM CHECK	What is my intelligibility and signal strength?
LOUD AND CLEAR WEAK BUT READABLE UNREADABLE	Reply to COMM CHECK request.
STAND BY {UNLESS URGENT} {IF ABLE}	Wait (until I'm ready to continue.) *Don't say this unless you really, really have to.* It brings the whole NET to a halt. If you do, resolve whatever is preventing you from communicating, as quickly as humanly possible. Preferably, say you'll call back, and release the channel. NCOs: add "UNLESS URGENT" if you are already working URGENT traffic or need to add emphasis to the NET that it should stand by. IF ABLE makes this (and any) request optional.
Either of: PREPARE TO COPY SAY WHEN READY TO COPY	Get pencil and paper ready. (Generally better to say what type of communication follows instead, so the operator can pick up the proper form.)
ACKNOWLEDGE	Place ACKNOWLEDGE at the end of your transmission when you wish the receiving station to state explicitly that they have received and understood your transmission. Use ACKNOWLEDGED to respond. NCOs are encouraged to use PLEASE before their request to set a friendly tone, but only where this does not add to the overhead. Sender: "MIKE ZERO THREE BRAVO, remain on station. ACKNOWLEDGE" Reply: "MIKE ZERO THREE BRAVO, ACKNOWLEDGED".
Either of:	Transmission received and understood.

ACKNOWLEDGED or ROGER	Stating that you acknowledge the sender is good practice but is best reserved where communications conditions are imperfect or where you believe it will be helpful to state explicitly that you received and understood the transmission. It is a mandatory response when the calling station includes ACKNOWLEDGE as part of their request. Of course, if you cannot answer ACKNOWLEDGED, then say "SAY AGAIN YOUR LAST" or "SAY AGAIN ALL AFTER [specific portion of last transmission]". "HAS THE MESSAGE" is a common alternative. More words, but more prevalent within Public Safety environments.
WILL DO	Will perform the requested action. This specifically means *future* tense.
Either of: IN WORK or IN PROGRESS	The action is being performed. This specifically means *present* tense.
UNABLE	Can't perform the requested action.
EN ROUTE	For Dispatch and movement situations. This indicates that the requested movement is happening.
Either of: ARRIVED or AT LOCATION	At the assigned or requested location. "ON SCENE" is to be avoided unless you are a communications component (unlikely) of a responding Public Safety unit.
READ BACK	Repeat the transmission back to check correctness.
READBACK INCORRECT	The readback was incorrect. The correct information is...
CORRECTION, ...	There was an error. The correct information is ...
SAY (Item)	Transmit the requested information item.
[I] SAY AGAIN (Item)	Repeat (item) or the whole transmission. I SAY AGAIN is used to repeat a critical portion of a message, or in response to SAY AGAIN. Example "MIKE ZERO THREE BRAVO, NET, contact your CTL immediately, I SAY AGAIN, contact your CTL immediately. ACKNOWLEDGE."
AFFIRMATIVE	Yes. (Easier to understand in noisy conditions.)
NEGATIVE	No. (Easier to understand in noisy conditions.)
SWITCH AND ANSWER [other Tactical ID] (channel name)	NCOC directs you to change to (channel name.) You're not expected to continue monitoring the NET channel. SWITCH AND ANSWER means you want the other station to switch to the channel and answer your call.
ON (channel name)	I am transmitting on (channel name.) Use when necessary to inform the other station how to answer. (Other stations expect to hear you on your assigned NET channel. Say this if you're calling on a different channel.)
DUAL RECEIVE	*Station* is capable of maintaining listening watch on assigned NET channel while communicating on another channel. Doesn't necessarily mean any individual operator at the station can do this, but the Station Communication team as a whole can. "NET, MIKE ZERO THREE BRAVO IS DUAL RECEIVE FOR COMMERCIAL CHANNEL 1." This tells NET that you are maintaining a listening watch on your assigned Primary channel and are also listening on the Commercial Radio System, channel 1.

(channel name)	If attached to a call, I request communication on (channel name.) If attached to an answer, I agree to communicate on (channel name.) If this involves interrupting the listening watch on your NET channel, get permission from NCOC first. If it doesn't, don't. Op Note: Identify channels by name, not by actual frequency. See the *ICS 205* form for channel names.
OVER	End of transmission, go ahead. Very rarely used in VHF FM; only necessary if conditions are too noisy to hear the carrier drop.
AVAILABLE	Can accept a new assignment or task.
NOT AVAILABLE	Not ready to accept a new assignment or task.
IN/OUT OF SERVICE	Used to indicate the status of a functional unit, such as a bus or Medical team. "WALKING TEAM THREE IN SERVICE, AVAILABLE" or "WALKING TEAM THREE OUT OF SERVICE. 10 MINUTES".

MORE TO FOLLOW
 	
 [READ BACK]
	Indicates that you are dropping the carrier (pausing) but have more information to pass.
	
	     Op Note: The expected response is for the receiving station to wait for additional information. The calling station may pause, or let the carrier drop. The calling station may also say MORE TO FOLLOW, STAND BY, and then say BREAK and call another station.
	
	     In MORE TO FOLLOW, READ BACK, acknowledge what has been transmitted so far using the read back procedure.
	
	     MORE TO FOLLOW is a break in a long transmission and also provides an opportunity for others to cut in with more urgent requests.

NOTHING FURTHER	I have no more traffic for you. May also be used by an NCO to terminate unproductive or unnecessary discussion.
DO NOT ANSWER	The transmission is intended as one-way and does not require acknowledgment. Used both at the beginning and end of a transmission: **"ALL STATIONS, ALL STATIONS THIS IS NET. DO NOT ANSWER. STAND BY FOR AN ANNOUNCEMENT {pause} ALL STATIONS, ALL STATIONS THIS IS NET, FIRST RUNNER RELEASED. DO NOT ANSWER. TIME 1000."**

Appendix B

NET and Channel Plan

Each segment of the AR support operation has several NETS, each with its assigned primary and secondary channels. This separation into multiple NET channels is necessary, both because of the volume of communication in most segments, and because there is no single repeater that can provide coverage over the whole extent of the Course.

The *ICS 205* form lists various frequencies, access tones, and channel names for the AR support operation. Each Segment Communication Plan lists the primary and secondary channel names to be used for each NET. The Course segment is divided into zones, each covered by a primary repeater and secondaries.

Before race day, Course station operators MUST load their radios with the primary and secondary channels for their zone, and the Course-wide simplex channel. It would be advisable to load the channels for the neighboring zones toward Hopkinton and toward Boston as well. It would be best to load in all the channels for your segment, in case there's a need for reassignment to a different post, or in case a channel becomes unusable. Also it's required that, where your assignment has a fallback plan, the channels and frequencies assigned are programmed and ready for use.

Never say actual frequencies and tones on the air. Use the published channel names (ie. FOXTROT 1, ROMEO 3, etc.).

Appendix C

Tactical ID Plan

Tactical IDs begin with a word or ICAO letter phonetic that identifies the type of post. If there's more than one post of that type in the segment, a number follows. If a segment has more than 9 posts of the same type, all posts have two-digit Tactical IDs; numbers less than 10 are expressed with a leading zero.

For example, Medical station 3 is expressed MIKE ZERO THREE.

If there's more than one operator at a single post (in the same NET), a letter phonetic follows, starting at ALFA for the CTL. Single operator posts do not need a letter suffix added.

Some of the Tactical IDs are interoperable between different radio services and between clients and operators. These may be client-assigned. Conform to the assigned Tactical ID to maintain smooth and professional communications with our clients and other partners.

Tactical ID	Function
START	START liaison operator (on Intertie net).
FINISH	FINISH Intertie liaison operator.
COURSE	COURSE Intertie liaison operator
UCC	MEMA Unified Command Center operator.
NET	Any NCOC station operator, all BAA Operations Centers, all NETS.
MIKE [01-26]	Medical stations 01 through 26.
MIKE [01-26] [ALFA-CHARLIE]	Individual and distinct field operators serving a Medical station. Where more than a single field operator is serving at one Medical station (there may be up to three), your Tactical ID should include ALFA, BRAVO, or CHARLIE to distinguish you as a specific field operator. This Tactical ID begins with ALFA as the Communication Team Lead. Operators need not identify with their individual Tactical IDs unless specifically called as such. Op Note: In almost all cases your distinguishing Tactical ID will be pre-assigned. In the event it is not, your CTL will inform your NCO, or direct that you inform the NCO, of your FCC Call sign and unique Tactical ID. Example 1: NET calls for any field operator at a Medical station: "MIKE ZERO THREE, NET" "MIKE ZERO THREE BRAVO ANSWERING". Example 2: NET calls a specific station operator: "MIKE ZERO THREE ALFA, NET" "MIKE ZERO THREE ALFA ANSWERING". Op Note: At a Medical tent, if you're the only field operator assigned, there is no need to add ALFA to your Tactical ID. Your NCO is aware of staffing at each field location. Op Note: At a Medical tent, where more than one field operator is assigned, rely on your CTL to make sure that responding to a call is

	delegated. They will make sure there is a rotation in this duty to prevent operator fatigue, or to meet exigent needs.
HOTEL [01-26] [LEFT or RIGHT]	Hydration stations 01 through 26, Left or Right of course. (Left and Right Hydration stations are physically separate. Each normally has a field station operator. If one operator is covering both sides, the LEFT or RIGHT suffix is not required.)
BUS [01-31]	Non-medical Transport bus 01 through 31.
PROFESSIONAL [1-4]	PROFESSIONAL Runner non-medical Transport bus 1 through 4.
EXPRESS [51-60]	Express Transport bus 51 through 60.
ALL STATIONS	Tactical ID for entire NET. All stations must listen to the following transmission. May be preceded by an alert tone.

The following Tactical IDs are used mostly around NCOCs on local simplex channels. Most of these are Communication Assistants (C/A's) serving a client official.

Tactical ID	Function
CHRIS TROYANOS	Medical Coordinator, BAA
BLAIR SUTHERLAND	Telecommunications Coordinator, BAA
DAVE McGillivray	BAA Course Director, Dave McGillivray.
MEDICAL DIVISION [A-E]	BAA MEDICAL Division Managers.
SEGMENT COORDINATOR (SC)	AR Segment Coordinator. In case of ambiguity, state the segment.
NETWORK	AR technical infrastructure support person in an NCOC.
PROCEDURES	AR PROCEDURES Controller (see NCOC guide).
INFO	AR INFO Controller (see NCOC guide).

Appendix D

ICAO Phonetic Alphabet and Punctuation

ALFA	INDIA	QUEBEC	YANKEE
BRAVO	JULIETT	ROMEO	ZULU
CHARLIE	KILO	SIERRA	
DELTA	LIMA	TANGO	
ECHO	MIKE	UNIFORM	DASH
FOXTROT	NOVEMBER	VICTOR	SLANT
GOLF	OSCAR	WHISKEY	DECIMAL
HOTEL	PAPA	X-RAY	COMMA

Time of day

Time of day is expressed as local time in 24-hour format.

> Op Note: NCOs should state current time occasionally, and at the end of their all-STATIONS announcements. Don't say ".. AT Ten Twenty Three hours", just say "...AT Ten Twenty Three".

Spoken numbers

Numbers in Tactical IDs (and everywhere else *except* time-of-day) are spoken digit-by-digit. TWO THREE, not TWENTY-THREE.

Leading zeroes are spoken in two-digit numbers below 10, such as in Tactical IDs. MIKE ZERO SEVEN BRAVO, etc.

> Op Note: ALL Tactical IDs for Medical and Hydration stations less than 10 are spoken with ZERO before the station digit. Example Medical station 3 is expressed MIKE ZERO THREE.

It is fine to use NINER in place of NINE and other ICAO numeric phraseology where it will improve understanding.

Decimals are expressed with the keyword DECIMAL. (example: "TEMPERATURE IS NINER EIGHT DECIMAL SIX.")

Appendix E

Optional Time-savers

To cut down non-communication overhead to the irreducible minimum, we allow several shortcuts cribbed from other radio services where extremely time-sensitive voice traffic is the norm. They're a further pruning of the Rapid Exchange. They judiciously trade added efficiency for an occasional repeated transmission.

They're especially useful for routine reports or non-medical dispatching. With a little practice, we believe you'll find them helpful and intuitive.

We cover them here in an Appendix, rather than in the main text, because they're not mandatory. You can use them if you're comfortable with them, and if communication conditions provide a solid copy.

Key principles:

- The vast majority of calls are between a field station and its NCOC. So, we make that the default.
  You can call the NCOC by transmitting just your own Tactical ID.
  The NCOC can call you by transmitting just your Tactical ID.
  To call anyone else, transmit the other station's Tactical ID first, then your own.

- Transmitting just your Tactical ID is sufficient to answer a call or acknowledge a transmission.
  Similarly, the NCOC can answer or acknowledge you with just your Tactical ID.
  (The logic is, responding proves that you heard the transmission. If you heard it, then *not* asking for a repeat or a fill means that you don't need one. Therefore responding with your Tactical ID and nothing else is *formally defined* to be an acknowledgment.)
  Unless communication conditions are rock solid, though, it's best to say ACKNOWLEDGED or ROGER where appropriate.

- Critical information must be read back for a positive check of accuracy. For other communications, readback is at each operator's discretion.

Rapid Exchange with optional time savers; Field Station is the caller

Station Speaking	Transmission	Illustrates These Procedure Rules
M18A	MIKE ONE EIGHT ALFA, activated.	To CALL NCOC, transmit your Tactical ID. Note that the ID of the channel or system has been omitted; this means the caller is on its assigned NET channel, where the NCO expects to hear it. The communication is attached to the call.
NCO	MIKE ONE EIGHT ALFA	NCO will ANSWER with your Tactical ID. A response without a request for a fill or repeat is *defined* as an acknowledgment.
M18A	KA1DEF	Transmit your FCC Call sign to END the exchange.

Op Note: Again, ONLY use these methods where communications conditions are excellent and there is no chance of confusion from other stations, or for non-critical communication.

Omitting explicit ending

If exchanges on a channel tend to be very similar and stylized in format, the ending may be obvious and not have to be made explicit by transmitting your FCC Call sign every time. Just remember to do it within 10 minutes afterward.

Abbreviated Tactical IDs

Stations on certain NETS have been heard using just the numeric part of their Tactical IDs when things are really busy. *Be careful with this.* It can cause problems, if it isn't done right. Does 22 mean BUS 22, MIKE 22, or HOTEL 22?

An operator should absolutely always **call** with the field station's complete Tactical ID. After that, there's relatively little risk of confusion if each transmission for the rest of the exchange begins with an abbreviated ID. Tactical IDs used *within communication content* should be complete, however.

Example:

Station Speaking	Transmission	Illustrates These Procedure Rules
NCOC	BUS 22, where are you?	To CALL, transmit the complete Tactical ID. This is a rapid exchange, with communication attached to the call.
BUS 22	22, arriving MIKE 14.	Abbreviated Tactical ID used to identify the station transmitting, *after* the complete Tactical ID has been given in the call. Complete Tactical IDs used within communication content to prevent ambiguity.
NCOC	22.	Acknowledged with just the abbreviated Tactical ID. It's obvious from context that this ends the exchange. Field station's FCC Call sign postponed until there's a lull in the traffic.

Revision history

Date	Version	Description
February 25, 2015	0.1	Steering Committee review
March 11, 2015	1.0	Public release
March 26, 2015	1.1	Added EMERGENCY message class and prosign
April 1, 2015	1.2	Updated with improvements in formatting and to conform with terminology for Medical and Hydration stations
March 12, 2016	2.0	Rewritten for 2016
April 10, 2016	2.1	Updated security statements
February 24, 2017	2.2	Updated for 2017. Some editing to reduce wordage and improve clarity. Formatted according to Documentation Design Standard.
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February 10, 2018	2.4	Minor updates for 2018.
March 3, 2018	2.4	Updated Foreword
March 18, 2018	2.5	Updated for 2018. Re-formatted title page per Document Design Standard and moved Committee list to page 2. Initial Release Candidate.
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March 8, 2022	4.x	Capitalization changes made for 2022.
March 28, 2023	4.0	Changes made for 2023.
March 23, 2024	4.1	Minor updates for 2024