

SEGARRN

Interoperability Training

System Wide Communications Coordination

Authored by the SEGARRN Training Committee

5/24/2011

This document aims to educate the SEGARRN user base on the essential interoperability capabilities built into the structure of SEGARRN and the radio communication technologies employed.

Contents

SEGARRN Interoperability Training	2
What is SEGARRN?.....	3
Interoperability Overview.....	4
National Incident Management System (NIMS)	5
Effectively using the NIMS Common Talk Group.....	6
SEGARRN is a Trunked System.....	7
Dealing with a Busy System	8
Coverage Map.....	8
Future Changes Needed	9
SEGARRN Recommendations and Requirements.....	9
Requirements	9
Recommendations.....	9

SEGARRN Interoperability Training

Instructor: _____

Welcome to the Southeast Georgia Regional Radio Network (SEGARRN) Interoperability training class. This class will aim to inform you on how to use the radio network to effectively work with other agencies outside of your own who also utilize the same radio system.

This class is formatted to address system wide functionality. Since each agency participating in SEGARRN will have slightly different settings in their radios, we are unable to address all functionality for all agencies. The primary focus is, as the name suggests, on interoperability.

This class also assumes you have a working knowledge of your radio. Should you need training on your radio or your agency specific setup on your radio, please see your agency trainer. Of course, we are open to questions and will answer any as best we can.

The training provided here is a work in progress. We strive to update it as quickly as possible and we welcome constructive criticism. If you have any suggestions, or if you notice important information missing, please make sure to inform your instructor.

What is SEGARRN?

From the SEGARRN website (segarrn.chathamcounty.org):

Southeast Georgia Regional Radio Network (SEGARRN) is a voluntary association composed of representatives of the [City of Savannah](#) and seven southeast Georgia counties ([Bulloch](#), [Bryan](#), [Camden](#), [Chatham](#), [Effingham](#), [Glynn](#) and [Liberty](#)). SEGARRN's goal is to complete build-out of a regional interoperable voice communications network for public safety throughout Southeast Georgia by 2012.

SEGARRN's vision is "To develop and sustain a public Safety communications system that allows licensees to individually own and maintain their portions of the infrastructure (sites) while the sites function together as a network with multiple layers of redundancy". SEGARRN's significance for the citizens of southeast Georgia is that the system "... design provides regional capability to support daily local operations, facilitates rapid response to man-made or natural disasters, and enables state and federal partners to plug-in and operate securely when and as needed."

Efforts to develop a regional interoperable communications system for public safety agencies in southeast Georgia may be traced to preparations for the yachting venue of the 1996 Summer Olympics in the Savannah area. Regional planning was acknowledged as necessary by the difficulty of the Hurricane Floyd evacuation in 1999. The G-8 conference held in coastal Georgia in 2004 was a further impetus to a regional approach to communications. Several single-county or multi-agency upgrade efforts coalesced beneath the SEAGARRN banner in 2006-2007 after Chatham County and the City of Savannah purchased a Smartzone controller which enabled a regional radio network.

Numerous SEGARRN member jurisdictions have been successful in combining local funding with state and federal grants to continue the process of building a regional interoperable communications system. In 2008, SEGARRN jurisdictions received major funding of \$7.1 million from [Public Safety Interoperable Communications \(PSIC\)](#) grant to establish a network master site and connectivity for the City of Savannah and six counties. Bulloch County also received PSIC funding to extend the network. PSIC funding has helped achieve the near-completion of the network in several counties, and initiation of the project in Liberty County.

Interoperability Overview

Interoperable communications has been defined as “the ability of public safety agencies to talk to one another via radio communications systems-to exchange voice and/or data with one another on demand, in real time, when needed”.

There are several benefits for each participating agency to work together on this system, but one of the top reasons is interoperability. When you need help in another jurisdiction; when you participate in a large event, such as St. Patrick’s Day in Savannah, and you need to communicate with the local agencies; when a large event, such as a hurricane, spans several jurisdictions; this system should be the backbone of those communications.

For the purposes of this training session, we will consider the following example scenarios:

Single Subscriber Scenario

An Amber Alert has been issued for a small boy believed to be kidnapped. He was last reported entering a blue Tahoe traveling south from North Carolina. Near the southern end of Chatham County, a Savannah-Chatham Metropolitan Police officer notices a similar vehicle traveling south on I95 and attempts to stop the vehicle. The officer turns his sirens and lights on and the vehicle speeds up to escape.

Multi-Agency Subscriber Scenario

Every year, Savannah hosts the St. Patrick’s Day festival which lasts anywhere from several days to a week. Every year there are several jurisdictions and various agencies which coordinate during the event.

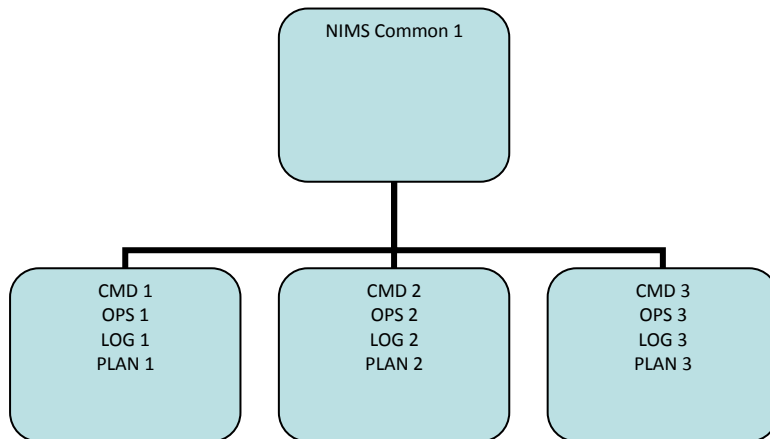
National Incident Management System (NIMS)

Many of you are already aware of NIMS and how it relates to the management of multi-agency situations. We will not attempt to teach NIMS here, but understand that it is the basis for the SEGARRN interoperability setup.

In each radio across the SEGARRN system, you will begin to see the NIMS zone located in the last zone of your radio. This zone is broken down in three major groups with a few reserved channels as follows:

<NIMS>1	Common 1
<NIMS>2	CMD 1
<NIMS>3	OPS 1
<NIMS>4	LOG 1
<NIMS>5	PLAN 1
<NIMS>6	CMD 2
<NIMS>7	OPS 2
<NIMS>8	LOG 2
<NIMS>9	PLAN 2
<NIMS>10	CMD 3
<NIMS>11	OPS 3
<NIMS>12	LOG 3
<NIMS>13	PLAN 3
<NIMS>14	RSRVE A
<NIMS>15	RSRVE B
<NIMS>16	RSRVE C

As a conceptual overview, this graphic shows the breakdown of the talk-groups differently:



As you can see, the NIMS zone is broken down into groups enabling 3 simultaneous incidents to utilize individual talk-groups without overlap. The groups listed for each incident are Incident Command (CMD), Operations (OPS), Logistics (LOG), and Planning (PLAN).

NOTE: The NIMS zone may be located in a different place depending on your agencies setup. Please make sure to ask where this zone is located in your radio if you are not sure.

Effectively using the NIMS Common Talk Group

There are several considerations when we start looking at utilizing the NIMS Common talk group effectively. If the NIMS Common is too cumbersome to locate or switch to, the process will reduce the effectiveness of our public safety officers.

To make the group easy to find and operate, while still keeping the group out of the way of other utilized locations in the radio, a committee made of SEGARRN representatives from each agency has decided to utilize A10 in every radio to “mirror” the NIMS Common talk group to. NIMS Common will still be located where it is now, only it should also be accessible from A10.

Class Example: A10 and NIMS Common communications. We will be setting one radio to the A10 position and another to the NIMS Common to show they are the same talk-group.

NOTE: As of the writing of this training material, the NIMS Common Talk Group is not accessible through A10 in all radios. It is currently available on all Chatham County, City of Savannah, and Effingham radios.

Referencing our scenarios described earlier, let’s see some possible solutions to these situations:

Single Subscriber Scenario

The officer knows they are entering Bryan County soon, so he switches to the NIMS Common talk group, located in position A10, to ask for assistance. At this point, all 911 centers monitoring the NIMS Common are now alerted and the multi-agency coordination effort to stop the vehicle can begin.

Multi-Agency Subscriber Scenario

Since several agencies have become involved, an Incident Command Post has been established and an Incident Commander is present. In working with Logistics, the Incident Commander had established the talk-groups to be used and decided on a single incident, consisting of talk-groups CMD1, OPS1, LOG1, and PLAN1.

Each ESF representative in the EOC should be on their respective talk-group. For instance, ESF-2 will have a radio on the LOG1 talk-group for coordination. Anyone wishing to speak to ESF-2 can begin the coordination efforts there. This could potentially turn into a problem with handling the volume of requests for any one ESF, so only appropriate personnel should use this avenue of communications. Always begin with your immediate leader within the NIMS structure to funnel information properly.

Other NIMS incident groups may be used in the event of another incident which occurs simultaneously.

Here, the NIMS Common, or A10, is only used for emergencies. This allows for the monitoring of this talk-group to continue while also serving the purpose intended. Most coordination efforts will occur through other talk-groups, such as OPS1, and the agency specific talk-groups.

SEGARRN is a Trunked System

Having a basic understanding of how the radio system functions is important. Most radio system users don't really care how it works and just want to be able to talk to who they need to, when they need to. We can't agree with this perspective more. Even though, there are benefits to you understanding how the network functions in order for you to understand what you can do with it.

This "trunking" used in the SEGARRN system allows for full radio system capacity by utilizing all available channels for each call to talk. This can easily be compared to a restaurant. There are many tables to serve the people waiting to eat. When all of the tables are full, then the people begin to wait in line until another table becomes available. The same concept applies, but we're talking on radios and not eating food.

Even though trunked radio systems are more appropriate for our public safety personnel, there are some conditions which could cause some complications. We'll try to explain those complications and how to make sure to avoid problems with them.

This is an exploration of the problems that can be encountered using trunked radio voice technology across a multiple site, wide area network. First, understand that "scanning" does not make a radio part of a talk group it scans in the same way as a radio set to that talk group. The following scenarios will explain more:

Scanning Scenario #1: A person in the field selects "NIMS Common" and attempts to establish contact with another person. This person is located in Bryan County. Site affiliation is with Bryan Simulcast. If no other subscriber on the system has selected "NIMS Common" then the audio will be routed to any other subscriber affiliated on the Bryan site that has that talk-group in its scan list. Audio will also be routed to any wire line consoles and will show up as unselected audio (low volume) or normal audio where it has been selected.

There are several failure modes in scenario #1. A subscriber affiliated on SAVCHAT site with NIMS Common in his scan list would not hear the call, unless at least one other subscriber on that site had the talk-group selected. This would also be true for ALL other sites.

There is no guarantee audio from a subscriber will arrive at another site unless some other subscriber affiliates as if he was going to talk on it. Users must be instructed on how scan works differently on a trunked system. A console connected to a consolle radio and not direct wire line control is just another subscriber.

Scanning Scenario #2: Three different subscriber radios in a small geographic group (like a command post) could be on two or three different sites at the same time. The subscriber makes the decision what site to affiliate with. There are different settings in the subscriber preferences and various other reasons related to propagation that could cause these phenomena. Think about this as related to scenario #1. The result possible missed messages. Relying on scanning when major operations are spread out over a large area using multiple talk-groups are the formula for missed messages. To guard against this, instruction should be provided to the users warning them about the possibility of problems related to scanning. If possible a separate radio, one on each talk-group used should be provided at a forward command post.

Scanning Scenario #3: All across our network hundreds of people are scanning the NIMS Channels just waiting for the big one. An incident is being worked at a local agency using the dispatch channel and the decision is made to expand the incident and use NIMS common to put out an all call for resources. Think about who would hear or miss this call. In all likelihood, an all call would originate this way but instead it would be routed to call centers and dispatched using regular dispatch talk-groups with instructions to change to the NIMS talk-groups.

Dealing with a Busy System

One last topic to cover relates to how the system behaves when it becomes busy. A lot of communication is happening and users begin to get busy signals on their radios when they push to talk. This means a channel is temporarily not available to be assigned at one or more of the sites affiliated with this talk-group. The subscriber is placed in a queue and in this scheme the higher priority talk-groups get to move to the front of the line to get the next channel. This is all automatic and normally the wait time is a few seconds.

The best defense against this is to enable talk permit tones on the subscriber that way you know for sure when you been assigned a channel. Those who do not use talk permit often begin talking when they press the push to talk button and the beginning of their message gets cut off.

Another defense is to understand that the subscriber will eventually (in a few milliseconds or several seconds however long it takes) signal (chirp) the user that they have a channel and can begin to talk. The users must be instructed not to repeatedly press the push to talk button or try to talk on other talk-groups for each time they will go to the back of the line in the wait queue.

Coverage Map

Included with your materials should be a coverage map. The instructor will go over the map with you and explain it.

Future Changes Needed

First, the A10 needs to be setup to mirror the NIMS Common in every radio across SEGARRN. We are pushing to have this implemented along with the reprogramming required for rebanding. This configuration change is in limbo at the time and a definite date on the actual programming could be months.

SEGARRN Recommendations and Requirements

Requirements

- Some form of local radio training should be established with each agency utilizing SEGARRN. While we can facilitate a system wide User's Group and some of the training, better training always comes from an individual within your own agency who knows your business model best.
 - With such a trainer in your agency, that person can pass on this information and enhance it with the training needed for your specific job.
 - Each agency should ask for a "CMS User Handout PDF". These handouts are very useful for finding the quick access talk-groups within your radio and quickly identifying what each button does.
- The NIMS zone needs to be programmed into all radios not currently equipped with the zone. This zone has been placed as the last zone in most radios and we prefer it there for the commonality. Though, if there is some need to place it somewhere else, then the local area training will need to cover it.

Recommendations

- While the NIMS zone exists in most radios, the A10 position may not be mapped to the NIMS Common talk-group. As part of our ongoing mission to get critical communications mapped to the NIMS Common in every Jurisdiction
- NIMS Common monitored in all dispatch centers. It's currently monitored in Effingham County only.
- A standard template for certain radio settings and features should be considered. For instance,