County Fire Standard
Operating Guideline

Category: Communications	**SOG#**	**802.01**
Issued by: Communications Sub Committee	**Issued on:**	**12.14.2011**
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INTEROPERABILITY		

Purpose:

The purpose of this guideline is to provide a uniform means for interoperable radio communications throughout the County in Mutual Aid Situations.

Background: Individual fire departments in the County operate on locally licensed radio frequencies on either VHF (HI) or UHF bands. Each department has a dispatch and operations frequency and a number have additional fireground or utility frequencies. During Mutual Aid responses, communication can be complicated or impaired by the necessity of all departments having to program their mobile and portable radios with all the potentially usable frequencies in the County; in some cases, where responding apparatus/portable radios are on a completely different frequency band, it is necessary for mutual aid companies to utilize two (2) radios in order to communicate with the host community.

Furthermore, it is noted that even within each community, those departments having only one dispatch/operations frequency at their command are under significant limitation to maintain command and control of more than one incident at a time or to respond to a "May Day" declaration by shifting to an alternate radio channel to maintain incident command while activating and inserting the RIT team for firefighter rescue operations. Interrupting Fireground Tactical Communications to announce extra alarms (including paging tones, box tones, etc) or to dispatch other emergency responses on a common channel is a distraction to the Incident Commander and firefighters engaged in the incident and can prevent critical communications being heard.

In general, it can be stated that as a General Practice, shifting to a Fireground Operations Channel whenever "All Companies Are Working" (Working Fire or better) is recommended.
This practice ensures against confusion on the fireground from other dispatch activity simultaneously occurring in the community during the prosecution of a working fire. In common practice, some departments shift to a fireground channel immediately after dispatch and upon arrival at the incident scene for any incident involving multiple apparatus response. Incident Commanders (IC's) should establish the practice of utilizing two (2) radios at the Command Post: one radio should be tuned to the Fireground Frequency and one radio should be tuned to the local Dispatch Frequency. Use of scanning features should be discouraged as these can allow messages to be missed. This procedure will ensure that both routine and emergency messages from fireground

personnel will not be interrupted or missed by the IC.

Mutual Aid Response Safety:

All mutual aid response "To Cover" should be conducted in "Code C" mode with apparatus proceeding with caution and without warning lights to the destination coverage station. When apparatus reaches the host town (city) limits, the officer should contact dispatch to announce that (Town/Unit/Number) is in the community responding to its cover assignment. Mutual Aid apparatus should remain on the Dispatch channel for the host community until assigned otherwise by local dispatch.

Host communities should avoid reassigning Mutual Aid apparatus to the fire until they reach town (city) limits if possible. Once reassigned "to the fire", mutual aid apparatus should utilize warning lights and siren and proceed with usual caution/emergency response procedures. The host dispatch should warn responding apparatus to use caution as they are responding "off prescribed routes" to avoid interference with other responding apparatus. Responding apparatus are reminded that communities through which they pass while en route to their assignment may not be aware that an emergency exists nearby and will not be alert to emergency responses through that community.

Observance of the County Accountability SOG is mandatory in Mutual Aid Response. Officers of mutual aid companies must maintain their company 'Collector Rings' with Accountability Tags. When assigned "to the fire", mutual aid companies must shift to the assigned Fireground radio frequency and thereafter all members refer to themselves on the radio by their Town (City), Unit Number, and Seat Number. Example: "Command, this is Peabody Engine 102". Seat number designations shall be the commonly accepted practice as follows (using example above for Peabody Engine 1):

Chauffeur	Officer
Engine 100	Engine 1
First jump seat (L)	First jump seat(R)
Engine 102	Engine 101
2nd jump seat (LI	2nd jump seatflO
Engine 104	Engine 103

Incident Commander will contact company leaders on the fireground using the Community/ Apparatus designation from the Accountability Collector Ring: Example: "Peabody Engine 1, Command Calling".

Tactical Communication Units (TAC COM): The County has provided four (4) mobile Cross-Band Repeaters or Tactical Communication Units (TAC COM) which enable the use of both UHF and VHF (HI) mobile and portable radios on an incident scene under certain conditions. These units utilize county licensed fireground frequencies in the respective bands so that responding companies need only shift to the county fireground frequency in their radios upon arrival and are then able to communicate seamlessly with one another and the Incident Commander. The TAC COM will be

assigned by the respective District 5 or 15 Control Point to respond on a Second Alarm to the host community according to the directive on the County 10-alarm response card in the following manner:

When a community advises the Fire Control Point of a "Working Fire" declaration, the Fire Control Point will contact the assigned TAC Com by cellular phone to place that unit on Alert;

If the assigned TAC COM is not available, the backup TAC COM will be alerted. Upon notification that a 2^n alarm has been declared by the host community, the TAC COM will be deployed by the Fire Control Point. Upon arrival in the host community, the TAC COM will report to the Incident Commander as follows: "Command, TAC COM (number) on scene, located at , repeater is activated and manned". The office in charge of the TAC COM or his authorized designee will remain with the vehicle and monitor all Fireground transmissions as a backup to the Incident Commander. In the event a communication appears to have been missed by the IC, the TAC COM officer will immediately alert the IC in person of the missed contact. (Future: All fireground communications will be recorded automatically in the TAC COM and a permanent record maintained.)

Primary and secondary TAC COM assignments will be maintained on the County 10-Alarm cards to be used by the Fire Control to dispatch these units. TAC COM units will be tested and availability maintained daily along with all community mutual aid status.

Only one (1) of these vehicles need be at the Incident Scene and if more than one is present, only one (1) should activate its repeater.

Tactical Communications Units are strategically deployed in the County as follows:

TAC COM 1:	Amesbury Fire Chief
TAC COM 2:	Danvers Fire Chief
TAC COM 3:	Georgetown Fire Chief
TAC COM 4:	Rehab 5

The Cross-Band Repeaters are only operable with the respective county licensed fireground frequencies for VHF and UHF radios (see listing of these frequencies below). No other frequency will function with these units.

Communication Guidance at various level responses:

Level 1: Standard response (still or box alarm) within the community with NO mutual aid response. Standard practice will be to utilize the local Dispatch channel or a fireground channel as fireground operations channel according to local SOP/SOG.

Level 2: Response involving one (1) Mutual Aid company only (eg. Line Box). Operate as in Level 1; Mutual Aid company will select the host community dispatch channel or fireground channel in accordance with standard practice.

Level 3: Multiple mutual aid responses at Working Fire or higher in accordance with the County 10-Alarm card. ALL companies (host and mutual aid) shift to county fireground frequency at the Incident. Mutual Aid covering companies shift to host community dispatch channel and report to cover assignments. TAC COM unit reports to incident, activates the cross-band repeater. The exception to this practice would be when the host community is a larger department with multiple licensed radio channels. In those cases, standard practice with common mutual aid companies would prevail.

Note: The host community may request the TAC COM at any time by contacting the Fire Control point. Dispatch of the TAC COM shall be automatic upon declaration of a 2nd Alarm by the host community even though Phase II Mutual Aid Response may not be effective until greater alarms have been declared.

Level 4: Major incident involving Unified Command and multiple agency response. Under these conditions, the county Cross-Band repeaters are limited to the county fireground repeater function. It will be necessary to contact Department of Fire Services and other agencies through the respective Fire Control communicators to obtain the more comprehensive fire communications resources to link all agencies. Available resources include FCAM Regional Communications Unit (Lowell Field Comm 60), DFS Comm Unit, Sheriffs units, etc. During Level 4 events, it will be necessary to shift radio channels to universal tactical channels (VTAC or UTAC)... see County Channel Plan.

Special Concerns:

There has been concern expressed regarding the fact that the fireground frequencies are not repeaterized and that the local dispatch may not be able to hear/record fireground messages. It has been demonstrated that direct channel operations are more than adequate for operations up to one-half mile from the Cross-Band Repeater vehicle. In addition, the vehicles will be equipped with event recorders which will record ALL fireground communications traffic PERMANENTLY to enable post-incident review as necessary. Further, the arriving chauffeur of the Cross-Band Repeater will be assigned to monitor all radio traffic during the incident as a backup to the Incident Commander.

It is recognized that some communities are surrounded with mutual aid support which all share a common frequency band. In all likelihood, the first five alarms of mutual aid response will not require the cross band repeater capability. An addendum to this SOG provides guidance regarding those communities which have a lower level of interoperability concern. In all cases, the need for and assignment of the TAC COM as a standardized Mutual Aid response will be controlled by the Fire Control Point in accordance with preassigned 10-Alarm Card procedures. Each community will be assigned TAC COM coverage according to a consensus of need.

NOTE: A benefit of universal adoption of this SOG to ALL Mutual Aid situations, even in the larger communities or where UHF/VHF interoperability is NOT an immediate concern would be the presence of the TAC COM unit on scene, with repeater and recorder activated and a NET officer monitoring all fireground activities PLUS the seamless addition of special units to the scene using

fireground channels only.

3. Experience will dictate whether the current placement and quantity of Cross Band repeaters is adequate for continuing operations. It is possible that some relocation of assets or an increase in numbers will be required. An example may be the City of Lawrence where UHF/VHF interoperability is a necessity at early stages of Mutual Aid. It may be advantageous for Lawrence to adopt an in-city TAC COM unit for their exclusive use.

4. It is recommended that periodic exercises be held to train personnel in the deployment of the Cross-Band repeaters and to verify the effectiveness of the Interoperability Plan.

ADDENDA:
5.

COMMUNITIES HAVING COMMON FREQUENCY MUTUAL AID RESPONSES:
(These communities need not be assisted by the Cross-Band Repeater Mobile units until an incident reaches greater than five (5) alarms).

District 5:
Lynn
Lynnfield
Nahant
Swampscott
Wakefield

District 15:
Amesbury
Georgetown
Merrimac
Newbury
Newburyport
Rowley
Salisbury

COUNTY FIREGROUND FREQUENCIES: (ESSEX COUNTY RED)

FUNCTION	NAMK	RX1R1Q	RX PI	IX KRKO	IX PI,	modi:
Foreground	**ESSEX RED**	**487.38750W**	**229.1**	**487.38750 W**	**229.1**	**Analog**
Fireground	**ESSEX RED**	**153.8300W**	**CSQ**	**153.8300W**	**77.0**	**Analog**

COUNTY CHANNEL PLAN:
The County Channel Plan is the recommended minimum channel arrangement to be included in all mobile and portable radios of each department. It is recognized that a totally identical channel

arrangement is not feasible given the wide variety of equipment in use in the County. Consequently, it shall be the responsibility of each department to both arrange the programming of their radios to include the minimum channel requirements of the County Channel Plan, AND to ensure that Mutual Aid companies responding outside the local community be informed of the "Dispatch" channel of the community to which they are responding. The responding companies shall report "Shifting to dispatch" upon departing their own community and "In your community and on your dispatch frequency" when arriving in the host community.

6.

Channel Plan (first sixteen channels)*:

*Discussion of Channel Plan:

Channel plan has been recommended for first sixteen (16) channels only as some communities are limited to only 16 channel radios. For those having greater numbers of zones and channels, additional channels may be programmed to include dispatch channels in other communities, DPW, water district and other agencies. It must be remembered that the local Dispatch will be responsible for advising responding apparatus as to the location of a specific communications channel. During dispatch for mutual aid response, it should be the LOCAL dispatcher's responsibility to inform the responding apparatus as to where to find the mutual aid community's dispatch channel (by zone and channel in the apparatus and portable radios).

Having the local dispatch channel programmed in the first and last channel of the portable radios is recommended to minimize confusion under local operating conditions in locating the channel for an emergency message; turning the selector switch all the way in either direction will connect the user with the home channel.

Having ALL County Mobile and Portable Radios programmed in common, with Channel 15 in the Main Zone will simplify instructing responders to shift to the Fireground Channel (Essex County Red) when responding or at the scene of a Mutual Aid event.

* Having ALL County Mobile and Portable Radios programmed in common, with a Universal Tactical Frequency (UTAC or VTAC) in Channel 14 in the Main Zone will simplify instructing responders to shift to a Level 4 Response when necessary under Unified Command.

NOTE: Specific frequencies will be published and distributed as part of the "Narrowbanding Guidelines on Reprogramming".

* Members should be cautioned concerning the use of "Emergency" buttons on radios if so equipped. These features typically default to the primary channel on the individual radio and as such may not be capable of reaching the desired recipient when operating at a distance from the home receiver. Declaration of a "MAY DAY" on the Fireground Channel during an emergency situation is the preferred and more reliable procedure.

NOTE: Universal Tactical Frequencies are nationally licensed frequencies in each band which are authorized for use by emergency responders. In general use, these are and should be simplex (not repeaterized) channels. In some cases, where local systems exist, repeaterized tactical channels are available for special events, large incidents, etc. Agencies outside Essex County are developing capabilities for comprehensive cross banding and complex interoperability needs. The advantage of UTAC and VTAC channels is that they are in common nationwide and therefore enable

communications for responders outside Essex County or Massachusetts.

References:

Allegheny County 9-1-1 Communications Center, Standard Operating Guidelines for Fire Communications, 11.16.2006.

Standard Operating Guidelines for Interoperable Communications within Grant County, WA, October 2009.

Improving Interoperability through Shared Channels, Dept. of Homeland Security, Version 2

The Interoperability Challenge, David Bibo and Leslie Thornton, 10.01.2006

Penobscot County Fire Chiefs Interoperability Communications Plan, 09.04.2008

Commonwealth of Massachusetts, Statewide Interoperability Process, December 2009.

Essex County Fire Chiefs - Communications Sub-Committee Survey, 11.2010.

ECFCADistrict5UHFChannelPlan

COMMUNICATIONS RESOURCE AVAILABILITY WORKSHEET	Frequency Band UHF RANGE 2 (450-520MHz)	Description **ESSEX COUNTY (D-5) CHANNEL PLAN** - UHF
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#	Channel Configuration	Channel Name/ Trunked Radio System Talkgroup	Eligible Users	RX Freq N or W	RX Tone/ NAC	TX Freq N or W	Tx Tone/ NAC	Mode A, D or M	Remarks
1	Local Dispatch								
2	Local Option								
3	Local Option								
4	Local Option								
5	Local Option								
6	Local Option								
7	Local Option								
8	Local Option								
9	Local Option								
10	Local Option								
11	Local Option								
12	Local Option								
13	District Channel	**"D-5 CONTROL"**	FIRE	460.1375 N	131.8	465.1375 N	D445 N	**A**	8 Digit display - "D-5-CTL"
14	Interop Channel	**"UTAC42D"**	ALL USERS	453.7125 N	CSQ	453.7125 N	156.7	**A**	
15	Firegroud Red	**"ESSEX RED"**	FIRE	487.3875 W	229.1	487.3875 W	229.1	**A**	8 Digit display - "ESSX-RED"
16	Local Dispatch								

The convention calls for frequency lists to show four digits after the decimal place, followed by either an "N" or a "W", depending on whether the frequency is narrow or wide band. Mode refers to either "A" or "D" indicating analog or digital (e.g. Project 25) or "M" indicating mixed mode. All channels are shown as if programmed in a control station, mobile or portable radio. Repeater and base stations must be programmed with the Rx and Tx reversed.

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strict5VHFChannelPlan

COMMUNICATIONS RESOURCE AVAILABILITY WORKSHEET				Frequency Band VHF HIGH BAND (136-174MHz)					Description **ESSEX COUNTY (D-5) CHANNEL PLAN** - VHF
#	Channel Configuration	Channel Name/ Trunked Radio System Talkgroup	Eligible Users	RX Freq N or W	RX Tone/ NAC	TX Freq N or W	Tx Tone/ NAC	Mode A, D or M	Remarks
Ji	Local Dispatch								
2	Local Option								
3	Local Option								
4	Local Option								
5	Local Option								
6	Local Option								
7	Local Option								

8	Local Option								
9	Local Option								
10	Local Option								
11	Local Option								
12	Local Option								
13	District Channel	**"D-5 CONTROL"**	FIRE	154.0700 N	131.8	158.7300 N	D226N	A	8 Digit display - "D-5-CTL"
14	Interop Channel	**"VTAC14"**	ALL USERS	159.4725 N	CSQ	159.4725 N	156.7	A	
15	Fireground Red	**"ESSEX RED"**	FIRE	153.8300 W	CSQ	153.8300 W	77.0	A	8 Digit display - "ESSX-RED"
16	Local Dispatch								

The convention calls for frequency lists to show four digits after the decimal place, followed by either an "N" or a "W", depending on whether the frequency is narrow or wide band. Mode refers to either "A" or "D" indicating analog or digital (e.g. Project 25) or "M" indicating mixed mode. All channels are shown as if programmed in a control station, mobile or portable radio. Repeater and base stations must be programmed with the Rx and Tx reversed.

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COMMUNICATIONS RESOURCE AVAILABILITY WORKSHEET	Frequency Band **UHF RANGE 2 {450-520MHz)**	Description **ESSEX COUNTY (D-5) CHANNEL PLAN - UHF**

#	Channel Configuration	Channel Name/ Trunked Radio System Talkgroup	Eligible Users	RX Freq N or W	RX Tone/ NAC	TX Freq N or W	Tx Tone/ NAC	Mode A, D or M	Remarks
1	Local Dispatch								
2	Local Option								
3	Local Option								
4	Local Option								
5	Local Option								
6	Local Option								
7	Local Option								
8	Local Option								
9	Local Option								

10	Local Option								
11	Local Option								
12	Local Option								
13	District Channel	**"D-15 CONTROL"**	FIRE	460.1375 N	131.8	465.1375 N	D662 N	**A**	8 Digit display-"D-15-CTL"
14	interop Channel	**"UTAC42D"**	ALL USERS	453.7125 N	CSQ	453.7125 N	156.7	**A**	
15	Firegroud Red	**"ESSEX RED"**	FIRE	487.3875 W	229.1	487.3875 W	229.1	**A**	8 Digit display - "ESSX-RED"
16	Local Dispatch								

The convention calls for frequency lists to show four digits after the decimal place, followed by either an "N" or a "W", depending on whether the frequency is narrow or wide band. Mode refers to either "A" or "D" indicating analog or digital (e.g. Project 25) or "M" indicating mixed mode. All channels are shown as if programmed in a control station, mobile or portable radio. Repeater and base stations must be programmed with the Rx and Tx reversed.

ECFCA
District 15 VHF
Channel Plan

COMMUNICATIONS RESOURCE AVAILABILITY WORKSHEET	Frequency Band Description **VHF HIGH BAND(136-174MHz) ESSEX COUNTY (D-15) CHANNEL PLAN-**VHF

#	■jjin i Configuration	J annel Name/ Trt-n"-1 Radio System Talkj-vLr	=i ri. i i	RX Freq Nor W	RX Tone/ NAC	TX Freq Nor W	Tx Tone/ NAC	Mode A, D or *M*	Remarks
1	Local Dispatch								
2	Local Option								
3	Local Option								
4	Local Option								
5	Local Option								
6	Local Option								
7	Local Option								
8	Local Option								
9	Local Option								

10	Local Option								
11	Local Option								
12	Local Option								
13	District Channel	"D-15 CONTROL"	FIRE	154.0700 N	131.8	158.7300 N	D343N	A	8 Digit display-"D-15-CTL"
14	Interop Channel	H$_{VTAC14}$"	ALL USERS	159.4725 N	CSQ	159.4725 N	156.7	A	
15	Firegrou nd Red	"ESSEX RED"	FIRE	153.8300 W	CSQ	153.8300 W	77.0	A	8 Digit display - "ESSX-RED"
16	Local Dispatch								

The convention calls for frequency lists to show four digits after the decimal place, followed by either an "N" or a "W", depending on whether the frequency is narrow or wide band. Mode refers to either "A" or "D" indicating analog or digital (e.g. Project 25) or "M" indicating mixed mode. All channels are shown as if programmed in a control station, mobile or portable radio. Repeater and base stations must be programmed with the Rx and Tx reversed.