Illinois Statewide
Interoperability Executive Committee (SIEC)
Technical Subcommittee

Technical Guidance and Recommendations for the Narrowbanding of Interoperability Channels.

Table of Contents: **Page**

1) TECHNICAL GUIDANCE OVERVIEW.

a. By Law, all Public Safety Radio systems in the VHF and UHF bands (150-512 MHz), including mobiles, portables, and base stations must be in Narrowband operation after December 31, 2012.

b. The Statewide Interoperability Executive Committee (SIEC) Technical Workgroup has developed a schedule, and this technical guidance document to assist agencies in meeting this Federal Communications Commission (FCC) requirement.

c. The narrowband implementation schedule for INTEROPERABILITY CHANNELS is in a four phase plan as follows.

i. Phase 1: Planning for narrowbanding, procurement of required base stations and mobile/portable radios and pagers, modifying FCC authorizations for narrowband operations. TODAY through March 31, 2012.

ii. Phase 2: Programming all appropriate mobile and portable radios for both wide and narrowband channels. TODAY through March 31, 2012.

iii. Phase 3: Convert statewide interoperable and mutual aid frequencies to narrowband operation in a COORDINATED manner. April 1, 2012 through October 31, 2012.

iv. Phase 4: Remove all wideband transmit channels from base radios, mobile and portable radios. November 1, 2012 through December 31, 2012.

d. Scheduling for Agency –Specific communications equipment is up to each individual agency.

e. The four phase plan scheduling only applies to interoperability channels in use in Illinois. Technical guidance and recommendations are applicable to any VHF-UHF narrowbanding implementation.

f. This document is based on the latest information available at release, and could be subject to change at any time. Updates will be released as they become available.

g. Narrowbanding by itself does NOT require moving to a digital or trunked radio system. Although there may be valid technical, operational, or financial reasons to move to a different system, it is not required under Narrowbanding. The decision on system type should be determined strictly by needs of the agency. VHF-UHF Narrowband analog mode is perfectly acceptable after December 31, 2012.

2) LICENSING AND FREQUENCY SELECTION:

a. When modifying the agency licenses:
    i. Be sure to ADD a narrowband emission designator for every wideband frequency you currently have on your license. This ensures you are operating legally as you transition from wide to narrow.
    ii. Only AFTER you are completely converted from wide to narrow, and are operating narrow only should you remove the wideband emission designators from your license. (Be sure that all the narrow emission designators remain!)
    iii. A simple change from wideband to narrowband does NOT require frequency coordination by the FCC. But, making any other change to the technical part of the license (frequency, power, antenna type or height, etc.) will probably require coordination, with associated costs.
    iv. If you are unsure of how to modify your license, contact your system vendor, a qualified RF engineer or consultant, or the Association of Public Safety Communications Officers (APCO) for advice.

b. As a general rule, agencies should add all applicable interoperability channels to their radios:
    i. All Public Safety users should add V-TAC and U-TAC series channels to their mobile and portable radios. All FCC Part 90 Public Safety licensees are eligible for V-TAC / U-TAC channels in their portable/mobile radios with no additional licensing.
    ii. All Public Safety users should add the applicable nation-wide discipline specific (Law, Fire, Med, etc.) interoperability channels to their mobile and portable radios. As a general rule, Part 90 Public Safety licensees are eligible for these channels in their portable/mobile radios with no additional licensing. If in doubt, check with the Illinois SIEC or APCO.
    iii. All Public Safety Users should add the applicable Illinois Interoperability channels to their mobile and portable radios. These channels (except MABAS-IL Fireground and IFERN) REQUIRE licensing and/or other approvals. Contact SIEC or APCO for more information.
    iv. Base stations operating on any interoperability frequency, including V-TAC, U-TAC and discipline specific frequencies require specific FCC licensing per site, just like any other base station.
    v. Federal VHF and UHF interoperability channels require Federal agency permission, and are not within the scope of this document.

3) EQUIPMENT CONSIDERATIONS:

a. If possible, agencies should consider, at a minimum, mobile and portable radios that can accept at least 48 channels in 3 groups of 16. This allows for:
    i. The capacity to configure the agency's radios with wideband and narrowband channels in separate zones. The operator can then select the correct zone at narrowband switch-over time, this will reduce the number of times the radio needs to be reconfigured.
    ii. Grouping of interoperability channels in a consistent format among all Public Safety agencies. These channel groupings are discussed in detail later in this document.

b. Base stations:
    i. Are normally limited to a low number of frequencies that can be programmed in the station. Most base stations are single-channel.
    ii. Multi-Channel base stations are available, but require dispatch consoles or controllers that can control base station frequency selection.
    iii. Shifting from wide to narrow in single channel base stations will generally require a technician to make the change at the site.

c. Radio Frequency Programming:
    i. Bear in mind that radios can only accept frequencies that they are designed for.
    ii. VHF radios can only accept VHF frequencies (150-174 MHz),
    iii. UHF radios can only accept UHF Frequencies (406-512 MHz).
    iv. Properly configured multi-band radios will accept both sets of frequencies.

d. Recommendations regarding "Zones" for radios (see Tables later in this document)
    i. Various manufacturers may refer to groups of channels as Zones, Groups, Mission Folders, or other terms.
    ii. Currently, interoperability channels are programmed differently in radios from different agencies and disciplines.
    iii. The intent is to create and use channel naming and grouping schemes that are identical as possible. Ideally, all radios will look identical to users from any agency while using the interoperability section of the radio.
    iv. The recommendation is 16 channels per Zone; Mobile radios can mimic portable radios in creating groups of 16 channels for consistency and training.
    v. Suggested Zone designators for Illinois VHF & UHF Interoperability are on the recommended narrowband zone charts.
    vi. Agencies should program channels in their radios based on their local Tactical Interoperable Communications Plans (TICP) and any interoperability agreements they have with their surrounding agencies. Agencies should only program channels they are authorized for.

e. Scan Implications:
    i. When in scan, radios will detect the same frequency when scanning the narrowband and wideband channels of the same frequency.
    ii. Scan programming is highly dependent on each agency's operational needs, and can be unique to each agency.
    iii. It is highly recommended that operational and technical personnel at each agency discuss and fully understand the scanning issues with mixed narrowband and wideband channels in the radio.
    iv. Scan programming should only be changed after discussion and consensus with the using agency.
    v. Possible radio features for Scan list programming:
        - Some radios support selecting from a number of preprogrammed scan lists, based on the selected channel.
        - Radios can be programmed to respond to coded squelch in a variety of different ways.
    vi. Agency Scan list(s) may need to be adjusted based on the calendar of the Phase 3 roll-out and changed on occasion due to the phased approach

f. Continuous Tone Coded Squelch System (CTCSS) or Digital Coded Squelch System (DCSS):
    i. National Interoperability channels use a Tone of 156.7 (5A).
    ii. Illinois Interoperability channels use varying tones / codes, be sure to check carefully when programming radios.
    iii. In the channel and frequency tables that follow, any CTCSS tones that have an asterisk * are proposed, and not yet approved as of this release date.
    iv. Tones may also be referred to as 'PL', or just the word 'tone'.
    v. Digital Coded Squelch Systems may be called DPL or "codes"

g. Frequency Use:
    i. Be aware that some frequencies are used under a national channel name and also under an Illinois channel name. This becomes important in any future incident communications planning.
    ii. Common examples are:
        - Illinois State Police Emergency Radio Network (ISPERN)
        - Interagency Fire Emergency Radio Network (IFERN)
        - Some Fireground channels.
        - And others.

4) IMPLEMENTATION CONSIDERATIONS:

a. CACHED RADIOS AVAILABLE:
   i. During change-over, cached radios may need to be deployed while agency radios are being reprogrammed.
   ii. Illinois Emergency Management Agency (IEMA) has a large supply of cache radios, mobile repeaters, and other assets that could be used during a changeover.
   iii. Cached radios should only be used if the local plan cannot be implemented otherwise.
   iv. Cached radios could be made available in case of system failure during change-over of base stations, including Illinois Transportable Emergency Communications System (ITECS) trailers used as temporary base stations
   v. Unified Command Posts may also be needed in addition to cached radios to assist in change-over during Phase 3
   vi. IEMA will develop a method for scheduling the use of their assets for cutovers, if cached radios are contemplated, and a method of emergency callout if required.
   vii. Any use of cached radios should be planned well in advance

b. INVENTORY AND COST ESTIMATES:
   i. Starting as soon as possible, agencies/entities should perform detailed inventory of portable, mobile, pager, and base station equipment. Inventory should include brand, model, and serial number. Working with vendors and manufacturers, determine equipment that needs to be replaced and which equipment can be used in the narrowband environment.
   ii. Based on the inventory, determine costs to replace or reprogram equipment. Be sure to consider travel time / user time in the calculations.
   iii. Procure new equipment if necessary.
      - Consider using Illinois Central Management Services radio master contracts for procuring radio equipment, IF the listed equipment will meet the agency needs. This may be a way for smaller agencies to use the state's volume discounts.
   iv. Determine costs for reprogramming for Phase 1 and 2 and Phase 4 for mobiles and portables. (Refer to elected official letter for a description of Phases, and the companion calendar. http://iema.illinois.gov/iema/SCIP/NarrowbandingLetter.pdf
   v. Determine costs for reprogramming for Phase 3 and Phase 4 for base stations and/or remote receivers.
   vi. Determine costs for any training, orientation, and meetings with users that may be required.

vii. It is highly recommended to include a pre and post bench testing, as well as an on the air check of radios before and after reprogramming in the scope of work.

c. NOTES AND COMMENTS:
   i. Radios must be FCC type accepted for narrowband operation to be compliant for narrow band emissions.
   ii. There are no known "kits" to legally modify legacy radios. To do so may void the radios' FCC Certification (formerly known as Type Acceptance) and may cause interference.
   iii. Simply "turning down" the deviation of wideband radios is not allowed, per FCC rules.
   iv. Oversight authority, per discipline, should act as a technical and procedural clearinghouse for questions or concerns. This includes MABAS, ISPERN Board, IREACH Board, and IEMA. If not sure who the technical contacts are, consult with SIEC.

d. TECHNICAL RESOURCES:
   i. http://tech.groups.yahoo.com/group/IllinoisNarrowBand/
   http://tech.groups.yahoo.com/group/LMR_Narrowbanding/
   http://www.narrowbandinglaw.com/
   http://www.apcointl.com/frequency/documents/NarrowbandOrder.html
   http://wirelessradio.net/

   NECP:
   National Emergency Communications Plan
   (Federal Interop)
   http://www.safecomprogram.gov/natlemergencycommplan/Default.aspx

   SCIP and TICP:
   Illinois State Communications Interoperability Plan and Tactical Interoperability Communications Plan:
   http://www.iema.illinois.gov/SCIP.asp

   SWIC (part of SCIP):
   Statewide Interoperability Coordinator
   ema.scip@illinois.gov

NIFOG:
The National Interoperability Field Operations Guide (NIFOG) is a technical reference for radio technicians responsible for radios that will be used in disaster response applications, and for emergency communications planners.
http://www.safecomprogram.gov/nifog/Default.aspx
http://www.publicsafetytools.info

Please report any broken links to: ema.scip@illinois.gov

5) PLAN GUIDANCE/OPERATIONAL PLAN FOR ROLL-OUT: (How to follow the phased plan)
    a. Check the SIEC narrowbanding calendar (http://www.iema.illinois.gov/SCIP.asp) for the cutover dates for the various interoperability channels in your location. Please note that there will be different dates for Fire vs. Law Enforcement, etc., as well as for different areas around the state.
    b. Scheduling technicians well ahead of time is highly recommended, this will help ensure your work can be completed on time.
    c. Work with technical personnel (or vendor) to determine scope of work, contracts, costs, and procurement schedule.
    d. Be sure to allow time for any required training and briefings.
    e. Assure readiness to move based on calendar, be ready for "the" day of change over

6) RADIO INTEROPERABILITY CHANNEL AND FREQUENCY TEMPLATES:
    a. These are used to show the recommended narrowbanded interoperability channel layouts in radios capable of 48 channels and above.
    b. 48 Channel radios generally use an ABC switch to select zones/groups/folders. This is designated by the Zone A, B, C at the top of the columns.
        i. Zone A&B are for internal agency use
        ii. Primary and Secondary are channels grouped by importance to a particular agency.
        iii. Zone C should be reserved for interoperability channel use only.
    c. Larger capacity radios use a keypad to select one of many zones, and use a display to show what channel is in use. The zone or group designator should be a letter or letters. "Multi-Zone" Radio will indicate the recommended letters for the interoperable zone/group/folder.
    d. Name = Channel Name
    e. Freq = Frequency to be programmed for that channel.
    f. CTCSS = Coded Squelch Code, required to access the channel. NOTE: as Asterisk (*) next to the tone indicates it is proposed but not yet a standard.
    g. Max Power is determined by the license for that particular channel, or by generally accepted guidelines.

48 CH Radio:	**Zone A**	**Zone B**	**Zone C**	**Discipline Narrow**		
	Primary	**Secondary**	**Multi-Zone Radio XX (NARROW)**			
Channels.	**Name**	**Name**	**Name**	**Freq**	**CTCSS/DCSS**	**Max Power**
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						
11						
12						
13						
14						
15						
16						

RECOMMENDED LAW ENFORCEMENT:

48 CH Radio:	Zone A	Zone B	Zone C	Law Narrow		
	Primary	Secondary	Multi-Zone Radio CL (NARROW)			
Channels.	Name	Name	Name	Freq	CTCSS/DCSS	Max Power
1			ISPERN	155.4750	D156 TX	See License
2						
3			IREACH	155.0550	D156	See License
4			VLAW31	155.4750	156.7	See License
5			VLAW32	155.4875	156.7	See License
6						
7						
8						
9						
10			VCALL10	155.7525	156.7	See License
11			VTAC11	151.1375	156.7	See License
12			VTAC12	154.4525	156.7	See License
13			VTAC13	158.7375	156.7	See License
14			VTAC14	159.4725	156.7	See License
15			SAR NFM	155.1600	127.3*	See License
16						

NIFOG Recommendation: “Default operation should be carrier squelch receive, CTCSS 156.7 (5A) transmit. If the user can enable/disable CTCSS/DCSS without reprogramming the radio, the indicated CTCSS/DCSS tone should also be programmed for receive, and the user instructed how and when to enable/disable.”

RECOMMENDED FIRE:

48 CH Radio:	Zone A	Zone B	Zone C	Fire Narrow		
	Primary	Secondary	Multi-Zone Radio CF (NARROW)			
Channels.	Name	Name	Name	Freq	CTCSS/DCSS	Max Power
1			IFERN	154.2650	210.7Hz	See License
2			IFERN2	154.3025	67.0Hz	See License
3			IREACH	155.0550	D156	See License
4			VFIRE21	154.2800	156.7	10 W
5			VFIRE22	154.2650	156.7	See License
6			VFIRE23	154.2950	156.7	10 W
7			VFIRE24	154.2725	156.7	10 W
8			VFIRE25	154.2875	156.7	10 W
9			VFIRE26	154.3025	156.7	See License
10			VCALL10	155.7525	156.7	See License
11			VTAC11	151.1375	156.7	See License
12			VTAC12	154.4525	156.7	See License
13			VTAC13	158.7375	156.7	See License
14			VTAC14	159.4725	156.7	See License
15			SAR NFM	155.1600	127.3*	See License
16			VMED29	155.3475	156.7	10 W

NIFOG Recommendation: “Default operation should be carrier squelch receive, CTCSS 156.7 (5A) transmit. If the user can enable/disable CTCSS/DCSS without reprogramming the radio, the indicated CTCSS/DCSS tone should also be programmed for receive, and the user instructed how and when to enable/disable.”

RECOMMENDED MEDICAL:

48 CH Radio:	Zone A	Zone B	Zone C	Med Narrow		
	Primary	Secondary	Multi-Zone Radio CM (NARROW)			
Channels.	Name	Name	Name	Freq	CTCSS/DCSS	Max Power
1			VMED28	155.3400	156.7	See License
2			VMED29	155.3475	156.7	10 W
3			IREACH	155.0550	D156	See License
4			MERCI340	155.3400	210.7	100W
5			MERCI400	155.4000	210.7	100W
6			MERCI280	155.2800	210.7	100W
7			MERCI220	155.2200	210.7	100W
8						
9						
10			VCALL10	155.7525	156.7	See License
11			VTAC11	151.1375	156.7	See License
12			VTAC12	154.4525	156.7	See License
13			VTAC13	158.7375	156.7	See License
14			VTAC14	159.4725	156.7	See License
15			SAR NFM	155.1600	127.3*	See License
16						

Note: Merci channels use PL210.7 for statewide use, local hospital PL tones vary.

NIFOG Recommendation: “Default operation should be carrier squelch receive, CTCSS 156.7 (5A) transmit. If the user can enable/disable CTCSS/DCSS without reprogramming the radio, the indicated CTCSS/DCSS tone should also be programmed for receive, and the user instructed how and when to enable/disable.”

RECOMMENDED EMRGENCY MANAGEMENT:

48 CH Radio:	Zone A	Zone B	Zone C	Emg Narrow		
	Primary	Secondary	Multi-Zone Radio CE (NARROW)			
Channels.	Name	Name	Name	Freq	CTCSS/DCSS	Max Power
1			ESMARN	155.0250	123.0	See License
2						
3			IREACH	155.0550	D156	See License
4						
5						
6						
7						
8						
9						
10			VCALL10	155.7525	156.7	See License
11			VTAC11	151.1375	156.7	See License
12			VTAC12	154.4525	156.7	See License
13			VTAC13	158.7375	156.7	See License
14			VTAC14	159.4725	156.7	See License
15			SAR NFM	155.1600	127.3*	See License
16						

NIFOG Recommendation: “Default operation should be carrier squelch receive, CTCSS 156.7 (5A) transmit. If the user can enable/disable CTCSS/DCSS without reprogramming the radio, the indicated CTCSS/DCSS tone should also be programmed for receive, and the user instructed how and when to enable/disable.”

RECOMMENDED FOR ANY UHF RADIO:

48 CH Radio:	**Zone A**	**Zone B**	**Zone C**	**UHF Interop**			
	Primary	**Secondary**	**Multi-Zone Radio CI**				
Channels.			**Name**	**Mobile RX**	**Mobile TX**	**CTCSS/DCSS**	**Max Power**
1			UCALL40D	453.2125	453.2125	156.7	See License
2			UTAC41D	453.4625	453.4625	156.7	See License
3			UTAC42D	453.7125	453.7125	156.7	See License
4			UTAC43D	453.8625	453.8625	156.7	See License
5			UCALL40	453.2125	458.2125	156.7	See License
6			UTAC41	453.4625	458.4625	156.7	See License
7			UTAC42	453.7125	458.7125	156.7	See License
8			UTAC43	453.8625	458.8625	156.7	See License
9							
10							
11							
12							
13							
14							
15							
16							

NIFOG Recommendation: “Default operation should be carrier squelch receive, CTCSS 156.7 (5A) transmit. If the user can enable/disable CTCSS/DCSS without reprogramming the radio, the indicated CTCSS/DCSS tone should also be programmed for receive, and the user instructed how and when to enable/disable.”

INTEROPERABILITY CHANNELS IN USE IN ILLINOIS BY CHANNEL NAME:
*(NOTE: VCALL / VTAC and UCALL / UTAC channels should be added to all Public Safety radios)

Name	RX Freq	TX Freq	CTCSS/DCSS	Max Power	Discipline	National or Illinois
*VCALL10	155.75250	155.75250	156.7	See License	All	National
*VTAC11	151.13750	151.13750	156.7	See License	All	National
*VTAC12	154.45250	154.45250	156.7	See License	All	National
*VTAC13	158.73750	158.73750	156.7	See License	All	National
*VTAC14	159.47250	159.47250	156.7	See License	All	National
*UCALL40	453.21250	458.21250	156.7	See License	All	National
*UCALL40D	453.21250	453.21250	156.7	See License	All	National
*UTAC41	453.46250	458.46250	156.7	See License	All	National
*UTAC41D	453.46250	453.46250	156.7	See License	All	National
*UTAC42	453.71250	458.71250	156.7	See License	All	National
*UTAC42D	453.71250	453.71250	156.7	See License	All	National
*UTAC43	453.86250	458.86250	156.7	See License	All	National
*UTAC43D	453.86250	453.86250	156.7	See License	All	National
ESMARN	155.02500	155.02500	123.0	See License	Emer Mgt.	Illinois
FGND BLK	154.27250	154.27250	94.8Hz	10 W	Fire	Illinois
FGND BLU	154.29500	154.29500	85.4Hz	10 W	Fire	Illinois
FGND GLD	153.83750	153.83750	91.5Hz	10 W	Fire	Illinois
FGND GRY	154.28750	154.28750	136.5Hz	10 W	Fire	Illinois
FGND RED	153.83000	153.83000	69.3Hz	10 W	Fire	Illinois
FGND WHT	154.28000	154.28000	74.4Hz	10 W	Fire	Illinois
IFERN	154.26500	154.26500	210.7Hz	See License	Fire	Illinois
IFERN2	154.30250	154.30250	67.0Hz	See License	Fire	Illinois
IREACH	155.05500	155.05500	D156	See License	Fire	Illinois
ISPERN	155.47500	155.47500	CSQ	See License	Law	Illinois
MERCI160	155.16000	155.16000	210.7	100W	Med	Illinois
MERCI220	155.22000	155.22000	210.7	100W	Med	Illinois
MERCI280	155.28000	155.28000	210.7	100W	Med	Illinois
MERCI340	155.34000	155.34000	210.7	100W	Med	Illinois
MERCI400	155.40000	155.40000	210.7	100W	Med	Illinois
SAR NFM	155.16000	155.16000	127.3	See License	All	Illinois
POINT	155.37000	155.37000	CSQ	See License	Law	Illinois
UHF MED-1	463.00000	468.00000	210.7	See License	Med	National
UHF MED-10	462.97500	467.97500	210.7	See License	Med	National
UHF MED-101	462.98125	467.98125	210.7	See License	Med	National

Name	RX Freq	TX Freq	CTCSS/DCSS	Max Power	Discipline	National or Illinois
UHF MED-102	462.98750	467.98750	Varies	See License	Med	National
UHF MED-103	462.99375	467.99375	Varies	See License	Med	National
UHF MED-11	463.00625	468.00625	Varies	See License	Med	National
UHF MED-12	463.01250	468.01250	Varies	See License	Med	National
UHF MED-13	463.01875	468.01875	Varies	See License	Med	National
UHF MED-2	463.02500	468.02500	Varies	See License	Med	National
UHF MED-21	463.03125	468.03125	Varies	See License	Med	National
UHF MED-22	463.03750	468.03750	Varies	See License	Med	National
UHF MED-23	463.04375	468.04375	Varies	See License	Med	National
UHF MED-3	463.05000	468.05000	Varies	See License	Med	National
UHF MED-31	463.05625	468.05625	Varies	See License	Med	National
UHF MED-32	463.06250	468.06250	Varies	See License	Med	National
UHF MED-33	463.06875	468.06875	Varies	See License	Med	National
UHF MED-4	463.07500	468.07500	Varies	See License	Med	National
UHF MED-41	463.08125	468.08125	Varies	See License	Med	National
UHF MED-42	463.08750	468.08750	Varies	See License	Med	National
UHF MED-43	463.09375	468.09375	Varies	See License	Med	National
UHF MED-5	463.10000	468.10000	Varies	See License	Med	National
UHF MED-51	463.10625	468.10625	Varies	See License	Med	National
UHF MED-52	463.11250	468.11250	Varies	See License	Med	National
UHF MED-53	463.11875	468.11875	Varies	See License	Med	National
UHF MED-6	463.12500	468.12500	Varies	See License	Med	National
UHF MED-61	463.13125	468.13125	Varies	See License	Med	National
UHF MED-62	463.13750	468.13750	Varies	See License	Med	National
UHF MED-63	463.14375	468.14375	Varies	See License	Med	National
UHF MED-7	463.15000	468.15000	Varies	See License	Med	National
UHF MED-71	463.15625	468.15625	Varies	See License	Med	National
UHF MED-72	463.16250	468.16250	Varies	See License	Med	National
UHF MED-73	463.16875	468.16875	Varies	See License	Med	National
UHF MED-8	463.17500	468.17500	Varies	See License	Med	National
UHF MED-81	463.18125	468.18125	Varies	See License	Med	National
UHF MED-82	463.18750	468.18750	Varies	See License	Med	National
UHF MED-83	463.19375	468.19375	Varies	See License	Med	National
UHF MED-9	462.95000	467.95000	Varies	See License	Med	National
UHF MED-91	462.95625	467.95625	Varies	See License	Med	National
UHF MED-92	462.96250	467.96250	Varies	See License	Med	National
UHF MED-93	462.96875	467.96875	Varies	See License	Med	National
VFIRE21	154.28000	154.28000	156.7	10 W	Fire	National
VFIRE22	154.26500	154.26500	156.7	See License	Fire	National
VFIRE23	154.29500	154.29500	156.7	10 W	Fire	National

Name	RX Freq	TX Freq	CTCSS/DCSS	Max Power	Discipline	National or Illinois
VFIRE24	154.27250	154.27250	156.7	10 W	Fire	National
VFIRE25	154.28750	154.28750	156.7	10 W	Fire	National
VFIRE26	154.30250	154.30250	156.7	See License	Fire	National
VLAW31	155.47500	155.47500	156.7	See License	Fire	National
VLAW32	155.48750	155.48750	156.7	See License	Fire	National
VMED28	155.34000	155.34000	156.7	See License	Fire	National
VMED29	155.34750	155.34750	156.7	10 W	Fire	National
Note CTCSS Tones with asterisk * are proposed at this time.						

Notes:
On MERCI and UHF Med channels, 210.7 Hz is the standard statewide PL. Various PL's are used at the local level.

NIFOG Recommendation: "Default operation should be carrier squelch receive, CTCSS 156.7 (5A) transmit. If the user can enable/disable CTCSS/DCSS without reprogramming the radio, the indicated CTCSS/DCSS tone should also be programmed for receive, and the user instructed how and when to enable/disable."

INTEROPERABILITY CHANNELS IN USE IN ILLINOIS BY FREQUENCY SORT:

Name	RX Freq	TX Freq	CTCSS/DCSS	Max Power	Discipline	National or Illinois
*VTAC11	151.13750	151.13750	156.7	See License	All	National
FGND RED	153.83000	153.83000	69.3Hz	10 W	Fire	Illinois
FGND GLD	153.83750	153.83750	91.5Hz	10 W	Fire	Illinois
IFERN	154.26500	154.26500	210.7Hz	See License	Fire	Illinois
VFIRE22	154.26500	154.26500	156.7	See License	Fire	National
FGND BLK	154.27250	154.27250	94.8Hz	10 W	Fire	Illinois
VFIRE24	154.27250	154.27250	156.7	10 W	Fire	National
FGND WHT	154.28000	154.28000	74.4Hz	10 W	Fire	Illinois
VFIRE21	154.28000	154.28000	156.7	10 W	Fire	National
FGND GRY	154.28750	154.28750	136.5Hz	10 W	Fire	Illinois
VFIRE25	154.28750	154.28750	156.7	10 W	Fire	National
FGND BLU	154.29500	154.29500	85.4Hz	10 W	Fire	Illinois
VFIRE23	154.29500	154.29500	156.7	10 W	Fire	National
IFERN2	154.30250	154.30250	67.0Hz	See License	Fire	Illinois
VFIRE26	154.30250	154.30250	156.7	See License	Fire	National
*VTAC12	154.45250	154.45250	156.7	See License	All	National
ESMARN	155.02500	155.02500	123.0	See License	Emer Mgt.	Illinois
IREACH	155.05500	155.05500	D156	See License	Fire	Illinois
MERCI160	155.16000	155.16000	Varies	100W	Med	Illinois
SAR NFM	155.16000	155.16000	127.3	See License	All	Illinois
MERCI220	155.22000	155.22000	Varies	100W	Med	Illinois
MERCI280	155.28000	155.28000	Varies	100W	Med	Illinois
MERCI340	155.34000	155.34000	Varies	100W	Med	Illinois
VMED28	155.34000	155.34000	156.7	See License	Fire	National
VMED29	155.34750	155.34750	156.7	10 W	Fire	National
POINT	155.37000	155.37000	CSQ	See License	Law	Illinois
MERCI400	155.40000	155.40000	Varies	100W	Med	Illinois
ISPERN	155.47500	155.47500	CSQ	See License	Law	Illinois
VLAW31	155.47500	155.47500	156.7	See License	Fire	National
VLAW32	155.48750	155.48750	156.7	See License	Fire	National
*VCALL10	155.75250	155.75250	156.7	See License	All	National
*VTAC13	158.73750	158.73750	156.7	See License	All	National
*VTAC14	159.47250	159.47250	156.7	See License	All	National
*UCALL40	453.21250	458.21250	156.7	See License	All	National

Name	RX Freq	TX Freq	CTCSS/DCSS	Max Power	Discipline	National or Illinois
*UCALL40D	453.21250	453.21250	156.7	See License	All	National
*UTAC41	453.46250	458.46250	156.7	See License	All	National
*UTAC41D	453.46250	453.46250	156.7	See License	All	National
*UTAC42	453.71250	458.71250	156.7	See License	All	National
*UTAC42D	453.71250	453.71250	156.7	See License	All	National
*UTAC43	453.86250	458.86250	156.7	See License	All	National
*UTAC43D	453.86250	453.86250	156.7	See License	All	National
UHF MED-9	462.95000	467.95000	Varies	See License	Med	National
UHF MED-91	462.95625	467.95625	Varies	See License	Med	National
UHF MED-92	462.96250	467.96250	Varies	See License	Med	National
UHF MED-93	462.96875	467.96875	Varies	See License	Med	National
UHF MED-10	462.97500	467.97500	Varies	See License	Med	National
UHF MED-101	462.98125	467.98125	Varies	See License	Med	National
UHF MED-102	462.98750	467.98750	Varies	See License	Med	National
UHF MED-103	462.99375	467.99375	Varies	See License	Med	National
UHF MED-1	463.00000	468.00000	Varies	See License	Med	National
UHF MED-11	463.00625	468.00625	Varies	See License	Med	National
UHF MED-12	463.01250	468.01250	Varies	See License	Med	National
UHF MED-13	463.01875	468.01875	Varies	See License	Med	National
UHF MED-2	463.02500	468.02500	Varies	See License	Med	National
UHF MED-21	463.03125	468.03125	Varies	See License	Med	National
UHF MED-22	463.03750	468.03750	Varies	See License	Med	National
UHF MED-23	463.04375	468.04375	Varies	See License	Med	National
UHF MED-3	463.05000	468.05000	Varies	See License	Med	National
UHF MED-31	463.05625	468.05625	Varies	See License	Med	National
UHF MED-32	463.06250	468.06250	Varies	See License	Med	National
UHF MED-33	463.06875	468.06875	Varies	See License	Med	National
UHF MED-4	463.07500	468.07500	Varies	See License	Med	National
UHF MED-41	463.08125	468.08125	Varies	See License	Med	National
UHF MED-42	463.08750	468.08750	Varies	See License	Med	National
UHF MED-43	463.09375	468.09375	Varies	See License	Med	National
UHF MED-5	463.10000	468.10000	Varies	See License	Med	National
UHF MED-51	463.10625	468.10625	Varies	See License	Med	National
UHF MED-52	463.11250	468.11250	Varies	See License	Med	National
UHF MED-53	463.11875	468.11875	Varies	See License	Med	National
UHF MED-6	463.12500	468.12500	Varies	See License	Med	National
UHF MED-61	463.13125	468.13125	Varies	See License	Med	National
UHF MED-62	463.13750	468.13750	Varies	See License	Med	National
UHF MED-63	463.14375	468.14375	Varies	See License	Med	National
UHF MED-7	463.15000	468.15000	Varies	See License	Med	National

Name	RX Freq	TX Freq	CTCSS/DCSS	Max Power	Discipline	National or Illinois
UHF MED-71	463.15625	468.15625	Varies	See License	Med	National
UHF MED-72	463.16250	468.16250	Varies	See License	Med	National
UHF MED-73	463.16875	468.16875	Varies	See License	Med	National
UHF MED-8	463.17500	468.17500	Varies	See License	Med	National
UHF MED-81	463.18125	468.18125	Varies	See License	Med	National
UHF MED-82	463.18750	468.18750	Varies	See License	Med	National
UHF MED-83	463.19375	468.19375	Varies	See License	Med	National
Note CTCSS Tones with asterisk * are proposed at this time.						

NIFOG Recommendation: “Default operation should be carrier squelch receive, CTCSS 156.7 (5A) transmit. If the user can enable/disable CTCSS/DCSS without reprogramming the radio, the indicated CTCSS/DCSS tone should also be programmed for receive, and the user instructed how and when to enable/disable.”

Definitions

APCO – Association of Public Safety Communications Officers

CSQ – Carrier Squelch, receiver hears any transmission on the channel.

CTCSS - Continuous Tone Coded Squelch System, sub-audible tones used to open the squelch on the target receiver.

DCSS – Digital Coded Squelch System, sub audible codes used to open the squelch on the target receiver.

FCC – Federal Communications Commission, regulatory agency for all Public Safety radio communications nationwide.

FCC Certification – Indicates FCC approval of radio equipment allowed to transmit in the United States.

Fireground – A term for radio channels used for on-scene tactical firefighting.

IEMA – Illinois Emergency Management Agency

IFERN – Interagency Fire Emergency Radio Network

ILEAS – Illinois Law Enforcement Alarm System, police mutual aid system in Illinois

IREACH – Illinois Radio Emergency Assistance Channel,

ISPERN – Illinois State Police Emergency Radio Network

ITTF – Illinois Terrorism Task Force

MABAS – Mutual Aid Box Alarm System, fire service mutual aid organization in Illinois

NIFOG – National Interoperability Field Guide, reference manual for interoperable communications

Part 90 – FCC Rules and Regulations are divided into parts, Part 90 deals with Public Safety Radio Communications

PL – “Private Line”, a proprietary term for tone coded squelch.

SIEC – State Interoperability Executive Committee, provides governance on interoperability in Illinois

TICP – Tactical Interoperable Communications Plan, describes the use of interoperability assets

UHF – Ultra High Frequency, a designation for the 300 – 3000 MHz frequency bands.

U-TAC– UHF Tactical, national channels set aside for use by the FCC for interoperability use.

VHF – Very High Frequency, a designation for the 30 – 300 MHz frequency bands

V-TAC – VHF Tactical, national channels set aside for use by the FCC for interoperability use.

Version Control

Date	Action	Author
9/27/2011	Pre-Final Version with formatting for approval	Rauter, Springer
10/27/2011	Final version with edits and CTCSS info added	Springer
11/22/2011	Final version after vetting	Springer
12/01/2011	Added Version Control page	Springer
12/01/2011	Added 123.0 CTCSS to ESMARN	Springer
12/01/2011	Added NIFOG language to recommended template pages	Springer
12/01/2011	Added CSQ, CTCSS, and NIFOG to definitions page	Springer
12/02/2011	Repaired SWIC and NIFOG Links	Springer
12/02/2011	Removed TICP Link until proper replacement is found.	Springer
2/15/2012	Combined IL SCIP and TICP to one link	Springer
2/15/2012	Changed NATSAR to SAR NFM per NIFOG	Springer
3/1/2012	Final Scrub 1. Typos and language cleanup	Springer, Choutka
3/2/2012	Final Scrub 2, Language cleanup, added DCSS definition.	Springer, Router