Missouri VHF Interoperable Channel Summary

Whitepaper

The Missouri State Highway Patrol and the Missouri State Fire Marshall have determined that the effective date for narrowbanding compliance on the public safety mutual aid channels they manage and have responsibilities for the use of will be ***March 1, 2012***

This document is intended to provide an overview to the multiple VHF High Band channels that are in use and available to public safety for interoperable communications purposes within and across disciplines in Missouri.

Missouri's use of VHF High Band public safety spectrum is widespread. Like many states, agencies across Missouri have depended on and implemented radio systems utilizing VHF High Band spectrum for their internal operations (Fire, EMS, Law Enforcement, etc.) for decades and the Federal Communications Commission has acknowledged that by assigning multi-discipline interoperable channels in the public safety VHF High Band spectrum. Due to the availability of these resources, interoperable communications can be achieved by users.

Interoperability channels have been implemented in all states designated for both *multi-discipline operations* as well as *discipline specific operations. "*Multi-Discipline" interoperability channels are **not** designated for use by users of a specific public safety discipline and are eligible for use by any public safety entity. The plan defining how these channels are utilized and the parameters for operation are usually developed by statewide interoperability bodies, such as a state's Statewide Interoperability Executive Committees (SIEC). Discipline specific interoperability channels are designated and reserved for users of a specific discipline (Fire, EMS, Law, etc.) and usually managed by a specific state agency or representative body representing that discipline under a state plan that outlines the channel(s) parameters for operation.

Below is a list of VHF High Band (~ 150 MHz) frequencies, to be used in either the simplex mode or in channel pairings and designated as *interoperable* channels with established channel names and recommended nationally by the US Department of Homeland Security-Office of Emergency Communications for use in State's in order to achieve necessary communications interoperability.

Receive MHz	Transmit MHz	Eligible Usage (Base-Mobile-Fixed)	Primary Use	National Common Name	Missouri Authority	FCC Limitations	Requires approval from Missouri Agency
155.7525	SIMPLEX	Base-Mobile-Fixed	Any Public Safety Eligible	VCALL10	N/A	90.20 (80,83)	N/A
151.1375	SIMPLEX	Base-Mobile-Fixed	Any Public Safety Eligible	VTAC11	N/A	90.20 (80)	N/A
154.4525	SIMPLEX	Base-Mobile-Fixed	Any Public Safety Eligible	VTAC12	N/A	90.20 (80)	N/A
158.7375	SIMPLEX	Base-Mobile-Fixed	Any Public Safety Eligible	VTAC13	N/A	90.20 (80)	N/A
159.4725	SIMPLEX	Base-Mobile-Fixed	Any Public Safety Eligible	VTAC14	N/A	90.20 (80)	N/A
154.280	**SIMPLEX**	**Base-Mobile-Fixed**	**Fire Service**	**VFIRE21**	**Missouri Div of Fire Safety**	**90.20 (19)**	
154.265	**SIMPLEX**	**Base-Mobile-Fixed**	**Fire Service**	**VFIRE22**	**Missouri Div of Fire Safety**	**90.20 (19)**	
154.295	**SIMPLEX**	**Base-Mobile-Fixed**	**Fire Service**	**VFIRE23**	**Missouri Div of Fire Safety**	**90.20 (19)**	
154.2725	**SIMPLEX**	**Base-Mobile-Fixed**	**Fire Service**	**VFIRE24**	**Missouri Div of Fire Safety**	**90.20 (19)**	
154.2875	**SIMPLEX**	**Base-Mobile-Fixed**	**Fire Service**	**VFIRE25**	**Missouri Div of Fire Safety**	**90.20 (19)**	
154.3025	**Simplex**	**Base-Mobile-Fixed**	**Fire Service**	**VFIRE26**	**Missouri Div of Fire Safety**	**90.20 (19)**	
155.340	**Simplex**	**Base-Mobile-Fixed**	**EMS**	**VMED28**	**Missouri Health and Senior Services**	**90.20 (40)**	

155.3475	**Simplex**	**Base-Mobile-Fixed**	**EMS**	**VMED29**	**Missouri Health and Senior Services**	**90.20 (40)**	
155.475	**Simplex**	**Base-Mobile-Fixed**	**Law Enforcement**	**VLAW31**	**Missouri State Highway Patrol**	**90.20 (41)**	
155.4825	**Simplex**	**Base-Mobile-Fixed**	**Law Enforcement**	**VLAW32**	**Missouri State Highway Patrol**	**90.20 (41)**	

To utilize the Law, Fire and Emergency Medical channels highlighted above, applicants **must** agree to operational conditions established for the use of each channel by the responsible authority. They are:

Missouri State Highway Patrol Communications Division

http://www.mshp.dps.missouri.gov/MSHPWeb/PatrolDivisions/COMM/index.html

Missouri Division of Fire Safety

http://www.dfs.dps.mo.gov/MARadioFreqSharAgrmt.htm

Missouri Department of Health and Senior Services

http://www.dhss.mo.gov/safety/ems/index.php

More information on the National Standardized Channel Names can be found at:

http://www.npstc.org/documents/IO_0060C_20090615_Standard_Channel_Nomenclature.pdf

VHF Channel Pairings for Tactical use throughout Missouri

In addition to the simplex use of the VTAC channels as outlined above, there has also been a recommendation from the US Department of Homeland Security Office of Emergency Communications to operate VTAC11 with VTAC12 and VTAC13 with VTAC14 as standardized repeater pairs for response based, temporary fixed repeater stations in a number of configurations with additional designated channel names. Given the effectiveness of repeater pairings in full duplex operation as compared to simplex operation of these channels, it is recommended that the recommended solutions for use of VTAC11-14 to best suit Missouri public safety interoperable communications are the following:

Name **Pair (subscriber Rx/Tx)**

VTAC36 = VTAC11 (151.1375 MHz) Base TX / VTAC14 (159.4725 MHz) Base RX *separation 8.335 MHz*

VTAC37 = VTAC12 (154.4525 MHz) Base TX / VTAC13 (158.7375 MHz) Base RX *separation 4.285 MHz*

These configurations are consistent with existing conventional repeater operation with the “hi in, low out” channel designations.

- The "direct or simplex" mode for these pairings – when users are transmitting on the repeater output, are VTAC11, and VTAC12, respectively. For subscriber radios using a button to select repeat or direct mode (if CTCSS and channel names on the radio display can be appropriately programmed) this configuration relieves the requirement to dedicate three added channel slots to support both direct and repeated modes, an important consideration for radios with limited capacity.

***CTCSS recommendation*.** To provide for controlled repeater access and to keep two repeaters within range of each other from locking up, the following tone recommendation was made:

a. **CTCSS 136.5 Hz on repeater input, 156.7 Hz on repeater output**.

NOTE: As documented in previous agreements, simplex use of VTAC11 through VTAC14 will continue to utilize CTCSS of **156.7 Hz on transmit** during simplex use of these national channels. Receive CTCSS can be implemented in either **156.7 Hz or carrier squelch (CSQ) mode.**

VCALL (155.7525 MHz) monitoring will continue to be carrier squelch (CSQ) mode.

Operational Use.

. To preserve simplex channel availability for day to day operation, we will, designate a primary and secondary repeater pair. For example: If only one transportable repeater is used, it should be on VTAC36 (VTAC11/VTAC14 paired). If a second is needed, it should be on VTAC37 (VTAC12/VTAC13 paired) with the understanding that there would remain no available simplex VTAC channels. VTAC13 and/or VTAC14 could be used as talk-around in either or both such use cases, at the risk of being interfered with by repeater users who can't hear the talk-around transmissions.

a. Repeater use should have no priority over **simplex use** of the involved channel(s). Repeater use should only be implemented at the direction of the Incident Commander

- It is strongly recommended that tactical repeaters be activated only when called for by an Incident Commander or COML as documented on an ICS Form 205 for an incident.

b. The Missouri Department of Public Safety has licensed Temporary Repeaters (FB2T) for the tactical VHF channel pairings listed above under FCC callsign WQLC526. We encourage local agencies to acknowledge and adhere to the values on WQLC526 when utilizing these tactical interoperable frequencies with such deployable

assets. Agencies utilizing the above frequency pairings in deployable equipment must notify the licensee, the Missouri Department of Public Safety, Stephen Devine, Interoperability Program Manager at 573-522-2382 as soon as practical after deploying such equipment.