Mutual Aid and Common Frequencies Manual 2021

Montana Department of Justice

215 N. Sanders St.
Helena, MT 59601-4522

July 2021

To Montana's Public Safety Community:

It is my pleasure to present the sixth edition of our *Mutual Aid and Common Frequencies* manual, and the first from the Montana Department of Justice. Legislation from the 2021 session moved the Public Safety Communications Bureau from the Department of Administration to the Department of Justice in alignment with our public safety mission.

Contained within is a wealth of information to help our law enforcement, fire, EMS and other emergency service providers communicate with one another. More than just a collection of rules, policies, and procedures, this manual offers practical suggestions on how critical land mobile radio mutual aid frequency resources can be used in all areas of the state, under the worst circumstances, for the benefit of our fellow Montanans.

I am pleased to announce a significant increase in frequency resources that are now available to the Montana response community. The State of Montana signed a Memorandum of Understanding (MOU) to license more than 40 federal frequencies designated for Interagency Law Enforcement and Incident Response operations. These radio frequencies are normally set aside for national interoperability between agents of the U.S. Federal Government. As a result of this MOU, Montana first responders now have even more radio communications frequencies available to help them support their mission to protect life and property.

Montana has a proud history of providing assistance to local agencies during disasters or emergencies that might have overwhelmed local, county, regional or tribal resources. Any emergency response—large or small—depends on simple and effective communication. The State of Montana recognizes that nothing is more important than improving the safety of our citizens, neighbors and responders.

In that spirit, I applaud the commitment and hard work of those who are making Montana a safer place for all our citizens.

Sincerely,

Austin Knudsen
Montana Attorney General

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Part I: General Information

Introduction

Mutual aid and common frequencies are a critical public safety radio resource because they are the means by which responders from different agencies and various public safety disciplines can communicate and interoperate. Rarely does an incident of any magnitude occur in which a single agency is the sole service provider. Whether they are standby EMS providers, fire suppression crews during a barricaded suspect call, or the traffic control and evacuation personnel during an urban interface fire, public safety agencies need to interoperate in today's world of incident response.

This chapter explains naming conventions used for mutual aid frequencies, describes authorization procedures and permitting for mutual aid frequencies, and shows the reader how to apply for a mutual aid frequency permit.

Updates and Revisions

This manual is updated as needed to reflect changes due to Federal Communications Commission (FCC) rules, frequency assignments, etc. Updates to this Mutual Aid and Common Frequencies Manual are posted on this website:
https://dojmt.gov/mutual-aid-manual/.

If you have suggestions for improvements, questions, or need clarification, please e-mail us at: frequency@mt.gov.

Authorization

The Department of Justice (DOJ) is responsible for developing policies and procedures for the effective and efficient use of mutual aid frequencies. This manual represents the State of Montana's mutual aid frequency Land Mobile Radio (LMR) operational parameters, or Standard Operating Procedures (SOPs).

Authority to Transmit on a Radio Frequency

Authority to transmit on a radio frequency comes from one of two ways:

1. A direct license with the FCC, in the case of tribal, state and local public safety entities. In order to transmit on radio frequencies, public safety agencies must hold a valid FCC license to operate an LMR (two-way radio). Federal agencies rely on the Inter-departmental Radio Advisory Council (IRAC) for frequency authorization. IRAC is part of the National Telecommunication and Information Administration (NTIA), which is located within the U.S. Department of Commerce.
2. A public safety agency enters into an interagency agreement with a regional or statewide public safety agency that holds FCC frequency licenses. The agreement allows the agency to use the license holder's frequencies for mutual aid communications. Permitted users may communicate not just with the license holder, but also with each other.

Mutual Aid Frequency Permits

In Montana, mutual aid frequency permits—rather than interagency agreements—are issued to allow public safety agencies to operate on the State's more than 20 Federal Communications Commission (FCC) licenses. According to FCC rules and regulations, public safety agencies must request permission from the State to operate on these frequency licenses. Mutual aid permits issued via our online permitting system give you this permission. The permitted user is bound by all restrictions of the FCC license, such as power output and range of operation. Permits must be kept current to avoid compliance issues with the FCC.

In addition, the State has signed an agreement that allows access to another 40 federal incident response and law enforcement frequencies. A mutual aid frequency permit is also required to access these frequencies. All of the State and Federal mutual aid frequencies are summarized in Part II, Mutual Aid Channel Summary.

DOJ issues mutual aid permits, coordinates policy and addresses abuse problems. As part of its responsibilities for assuring proper frequency utilization and operations, DOJ works with agencies across the state to investigate and resolve interference and other issues. DOJ has the authority to revoke permission to use mutual aid licenses when they have not been properly permitted or when abuse occurs. However, the ultimate authority for frequency operations rests with the FCC or the NTIA for federal frequencies.

Color Names

The term “mutual aid” means different things to different people, even when restricted to radio. When used to name a frequency or particular channel, it often leads to confusion over just which mutual aid frequency is being referred to. In public safety radio where clarity and simplicity of communications are essential, long and contrived names for basic tools can be burdensome. For this reason, the color names have been historically assigned to reference mutual aid and common frequencies.

Color names were chosen because the names are short, commonly recognized, and have been linked with associative memory. The actual colors are not intended to be painted on radio control heads or otherwise used where different shades are indistinguishable or colorblind persons may mistake them.

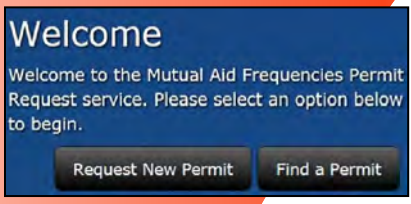
The National Public Safety Telecommunications Council has established a national channel naming convention for nationwide interoperability channels. In order to integrate with the national naming standards, the State of Montana now recommends that agencies include both the color name and the National Interoperability Designator (i.e. VLAW, VFIRE, VMED) in their communication plans as well as for channel names on radios. Both the color channel name and national designator should be communicated when assigning frequency resources on incidents involving federal agencies or agencies from other states.

How to Apply for a Permit

Permission to use Montana Mutual Aid and Common Frequencies requires an approved Mutual Aid and Common Frequencies permit from DOJ. All users are subject to FCC regulations and Standard Operating Procedures (SOPs) as outlined in the *Mutual Aid and Common Frequency Manual*, 2021 Edition.

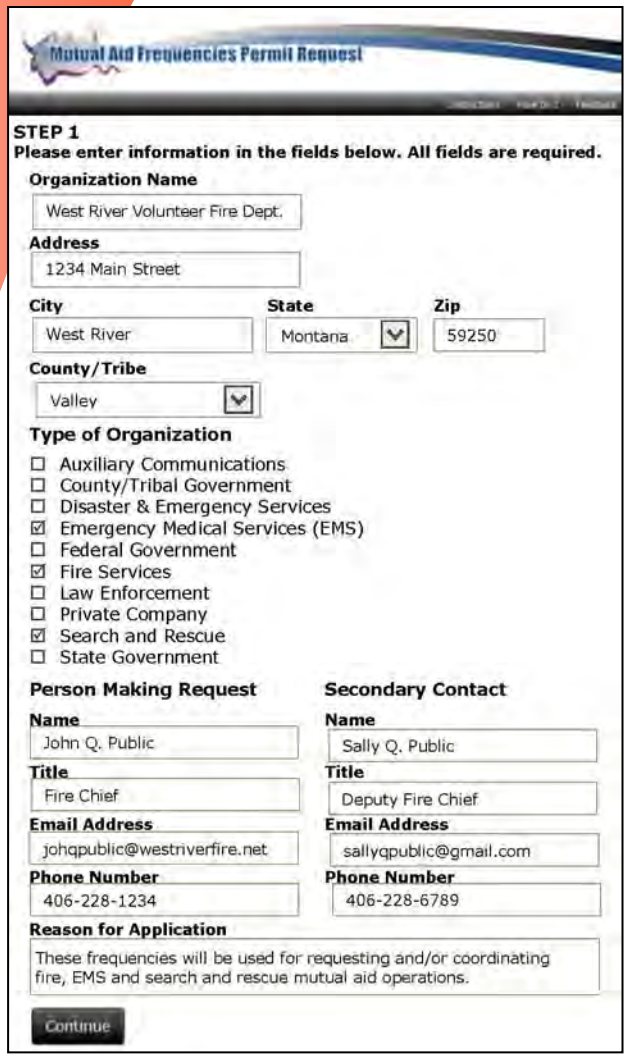
Generally, a single permit is issued for a specific organization. For example, a county ambulance service would apply for its own mutual aid frequency permit separate from the county fire department. Each agency is issued a mutual aid permit in its own name.

The application process is simple. Simply go to this site: https://mutualaid.mt.gov and click on the “Request a New Permit” button. You also have the option to find or modify an existing permit either by searching the number, the name of the public safety agency, or viewing all permits within a county or tribe.



Step 1. Complete the required information for the agency, including name, address, county/tribe, type of organization, contact information, email addresses and reason for the application.

Press the "Continue" button.



Step 2. Select the frequencies the agency is eligible for and is either already using or wants to use in its radios. Refer to the specific sections of this manual for more information about which frequencies are available for different public safety disciplines.

For example, let's say the fictional West River Volunteer Fire Department (VFD) near the Canadian border in Valley County wants to obtain a mutual aid permit for its operations. As a public safety entity, the Fire Chief will put a check mark in the boxes next to two of the General Use frequencies: **GOLD** and **TAN** to request those frequencies on their permit. A quick click on the "**NEON** Restriction Map" reveals that the General Use Frequency of **NEON** is not available in Valley County.

STEP 2
Please choose the frequencies you wish to request from the list below:

General Use

☑	153.9050 **GOLD**	**State Common Mutual Aid**
☑	155.3400 **TAN (VMED28)**	**Statewide Air-to-Ground Coordination**
☐	157.4250 **NEON**	**General Mutual Aid and Coordination**

Restrictions:

- 40-Watt Mobile Limit
- Not available within 120 km of Coutts, AB, including the following jurisdictions: Blackfeet Reservation and Glacier, Liberty, Pondera and Toole Counties.
- Not available in: Daniels, McCone, Richland, Roosevelt and Valley Counties or on the Fort Peck Reservation.
- **NEON Restriction Map**

Additional General Use Mutual Aid Frequencies (Not Available Statewide)
General purpose interoperability channels for all law enforcement, fire, EMS and medical agencies including local, state, tribal and federal users.
Also available for use with temporary, deployable base stations.

☐ 154.4525 **CHARLIE (VTAC12) Tactical General Use Interoperability**

- Secondary status to existing co-channel and 7.5 kHz adjacent channels in the following counties: Broadwater, Cascade, Jefferson, Hill, Lewis and Clark and Powell.
- **CHARLIE Restriction Map**

☐ 155.7525 **DELTA (VCALL10) Tactical General Use Interoperability**

- Secondary status to existing co-channel and 7.5 kHz adjacent channels in the following counties: Broadwater, Cascade, Jefferson, Hill, Lewis and Clark and Powell.
- **DELTA Restriction Map**

☑ 158.7375 **ECHO (VTAC13) Tactical General Use Interoperability**

- Not available above Line A per FCC license except at these Interoperability Repeater Sites: **Highwood Baldy** (Chouteau County), **Mount Royal** (Liberty County), **SACO** (Phillips County) and **Windy Hill** (Roosevelt County/Fort Peck). Use channels 154.4525 MHz Repeater TX/ 159.4725 MHz Mobile TX.
- Not available in Lake and Missoula Counties.
- Secondary status for mutual aid use in the following counties: Granite, Mineral, Powell, Ravalli, Sanders and within 20 km of Maverick Mountain in Beaverhead County.
- **ECHO Restriction Map**

☐ 159.4725 **FOX (VTAC14) Tactical General Use Interoperability**

- Not available above Line A.
- Secondary status within 20 km of Maverick Mountain in Beaverhead County.
- **FOX Restriction Map**

☑ 151.1375 **GOLF (VTAC11) Tactical General Use Interoperability**

- Not available above Line A per FCC license except at these Interoperability Repeater Sites: **Highwood Baldy** (Chouteau County), **Mount Royal** (Liberty County), **SACO** (Phillips County) and **Windy Hill** (Roosevelt County/Fort Peck). Use channels 154.4525 MHz Repeater TX/ 159.4725 MHz Mobile TX.
- Secondary status to existing co-channel and 7.5 kHz adjacent channels in Mineral County and within 20 km of Maverick Mountain in Beaverhead County.
- **GOLF Restriction Map**

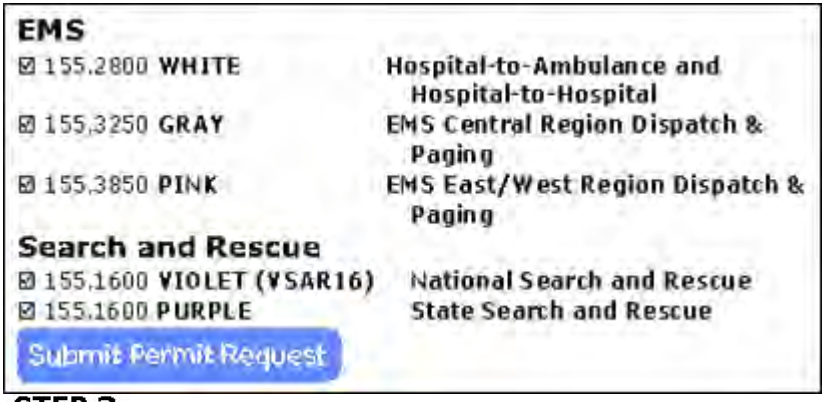
General purpose interoperability channels are then listed on the site. By viewing the restriction maps, the West River VFD Fire Chief would see that the fire department is only eligible for **ECHO** and **GOLF** so that it can use the Interoperability Repeater Site at SACO located in Phillips County, which also provides coverage in Valley County.

Since the West River VFD responds to within 10 miles of the US-Canadian border during emergencies, the Fire Chief will want to apply to use the **BLUE (VLAW31)** Border Interoperability channel. As a fire agency, it qualifies for all the fire frequencies [i.e. **RED**, **MAROON (VFIRE21)**, **CORAL (VFIRE22)**, etc.] as outlined in its communications plan, provided that the frequencies are not restricted for use in its geographic area. After checking the boxes next to the frequencies wanted, the Fire Chief may want to select the button "Show All Frequencies" to see a complete list of all available Mutual Aid frequencies.

Since the West River VFD also is a licensed EMS provider, it is eligible to apply for the EMS frequencies of **WHITE**, **GRAY** and **PINK**. The fire department is not authorized to have law enforcement frequencies, so boxes are not checked next to these. If the department regularly participates in Search and Rescue activities in conjunction with its local law enforcement agencies, the Fire Chief may also want to apply for **VIOLET (VSAR16)** and **PURPLE**, the national and state search and rescue frequencies.

Click on the “Submit Permit Request” button.

Step 3. Print a receipt for your records. Personnel in DOJ will receive an automatic e-mail telling them that a request is pending. As soon as the request is processed and approved, a link to the permit is sent, and the applicant can print it out for their agency’s records.



STEP 3

Print this page for your reference.

Organization Name: West River Volunteer Fire Dept.

You have submitted a request for permission to use the following frequencies:

153.9050 **GOLD** - State Common Mutual Aid
155.3400 **TAN** - State Fire Repeater
158.7375 **ECHO** - Tactical General Use Interoperability
151.1375 **GOLF** - Tactical General Use Interoperability
155.4750 **BLUE** - General Purpose Border Interoperability
153.8300 **RUBY** - State Fire Repeater
154.0700 **RED** - State Fire Mutual Aid
154.2650 **CORAL** - State Fire Ground #1
154.2725 **COPPER** - State Fire Ground #3
154.2800 **MAROON** - State Fire Command and Control
154.2875 **BURGUNDY** - State Fire Ground #4
154.2950 **SCARLET** - State Fire Ground #2
154.3025 **CRIMSON** - State Fire Ground #5
159.3450 **GARNET** - State Fire Repeater Control
172.2250 **ALPHA** - Interagency Fire Use Only
172.3750 **BRAVO** - Interagency Fire Use Only
155.2800 **WHITE** - Hospital-to-Ambulance and Hospital-to-Hospital
155.3250 **GRAY** - EMS Central Region Dispatch & Paging
155.1600 **VIOLET** - National Search and Rescue
155.2200 **PURPLE** - State Search and Rescue

Date Submitted: 8/26/2021 11:42:29 AM

Requested by:
John Q. Public
Fire Chief
johnqpublic@westriverfire.net

Part II: Montana Mutual Aid Channel Summary

Introduction

In Montana, more than 80 mutual aid and common VHF frequencies provide the basis for interagency radio communications. All mutual aid frequencies are narrowband. The manual uses the term “mutual aid” to refer to frequencies designated for interagency communications that are licensed statewide. Authorization for their use is given through agreement or permit with DOJ.

Before the channel summary is presented, a few key terms are explained, such as “Line A,” Airborne Usage, Encryption, Continuous Tone-Coded Squelch System (CTCSS), and Network Access Codes (NAC) Codes. These concepts are described to provide readers with a better understanding of frequencies and regulations.

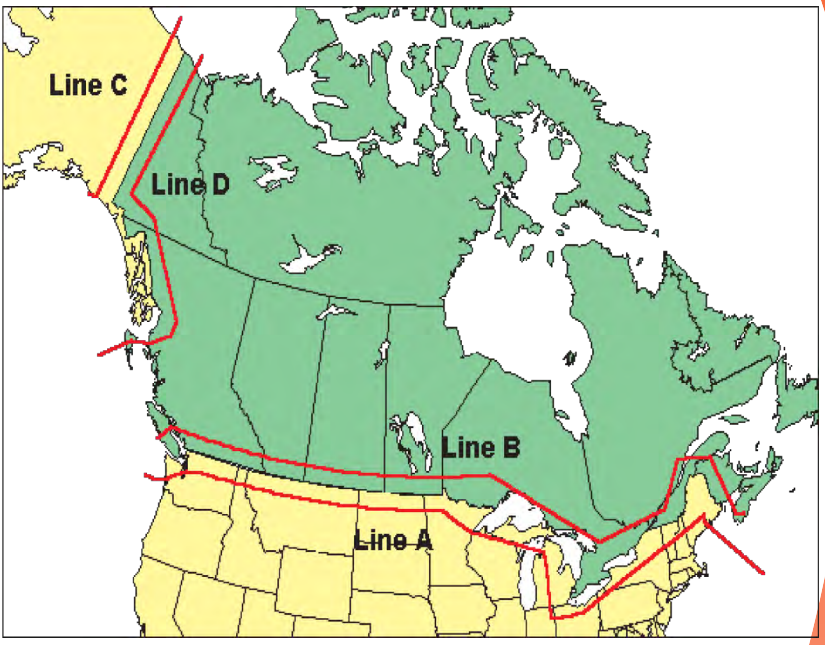
FCC “Line A” Regulations

When requesting or using mutual aid frequencies, you might hear a reference to the term, “Line A.” Spectrum used near Montana’s international border with Canada may require FCC coordination with Canadian authorities. FCC “Line A” Regulations are meant to protect U.S. and Canadian land mobile operations near the U.S./Canadian border from interference. “Line A” is an imaginary line within the US that approximately follows the 48th Parallel across the State of Montana, which is located about 75 miles south of the U.S./Canadian border (a similar zone exists on the Canadian side, “Line B”, as shown in Figure 1).

Given Montana’s 545-mile border with three provinces of Canada (Alberta, British Columbia, and Saskatchewan), many of Montana’s statewide licenses are restricted for use below Line A. This restriction is illustrated in the map shown in Figure 2.

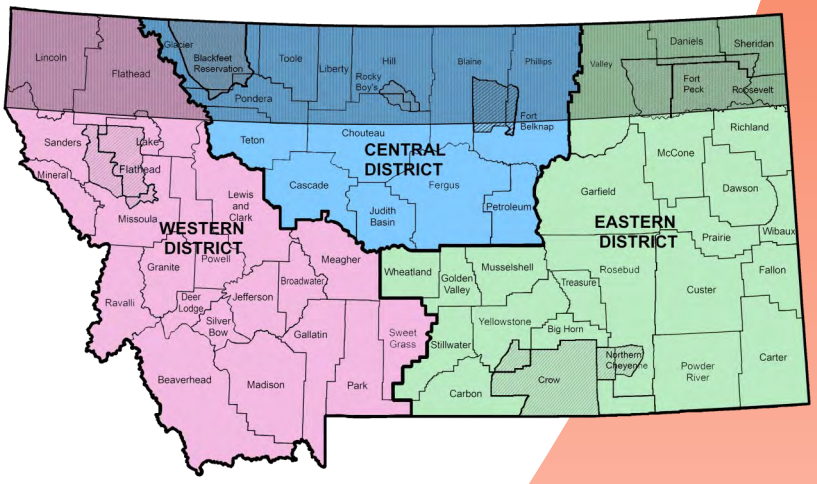
Please note that all maps used in this manual are based on the geographic distribution of the three Montana Disaster and Emergency Services (DES) Field Service Districts as illustrated in Figure 2.

Figure 1: "Line A" Map



Lines A and B are imaginary lines along the US-Canadian border where restrictions on frequency use exist to protect land mobile operations from interference.

Figure 2: Line A and DES Field Service Districts



DES has divided the state into three Field Service Districts, as illustrated here. Maps used in this manual are based on this geographic distribution. Figure 2 also illustrates Line A, which runs about 75 miles south of the US-Canadian border. Many of Montana's statewide licenses are restricted for use below Line A.

Airborne Usage

FCC Regulation §90.423 defined restrictions for using FCC frequencies for airborne-to-ground operations, as follows:

> FCC §90.423 (a) - Mobile stations . . . may be operated aboard aircraft for air-to-mobile, air-to-base, air-to-air and air-to-ship communications subject to the following: (1) Operations are limited to aircraft that are regularly flown at altitudes below 1.6 km (1 mi) above the earth's surface; (2) Transmitters are to operate with an output power not to exceed ten watts; (3) Operations are secondary to land-based systems; (4) Such other conditions, including additional reductions of altitude and power limitations, as may be required to minimize the interference potential to land-based systems.

DOJ recommends not utilizing tactical channels in airborne operations, because this use has the potential to 'walk over' portable simplex ground communications, which may pose a risk to responder safety in nearby jurisdictions.

Encryption

The use of mutual aid channels for transmission of any encoded, encrypted, digital, or scrambled message is prohibited with two exceptions:

1. Tactical law enforcement operations on the **BLACK** channel where encryption may be utilized in combination with a regional plan.
2. Some hospitals or EMS organizations may have written communication plans in place to use the **WHITE** channel for sensitive ambulance-to-hospital communications. Radio users should switch to encryption only when communicating confidential patient information or other information that needs to be secure. **WHITE** should never be monitored while operating in an encrypted mode.

Encryption is prohibited on mutual aid channels because it largely eliminates interoperability and causes other users to cease monitoring the affected channel. It also requires a degree of cooperation between agencies that suggests a normal operational channel should be used for the communications. Protocols for using specialized encryption and tactical language should be incorporated into your Incident Action Plan or Incident Management Communications Plan.

Continuous Tone-Coded Squelch System (CTCSS) and Network Access Codes (NAC)

The Continuous Tone-Coded Squelch System (CTCSS) is used to reduce the annoyance of listening to other users on a shared two-way analog radio communications channel and is sometimes called "tone squelch." Network Access Codes (NAC) are used in Project 25 digital radios.

Continuous Tone-Coded Squelch System (CTCSS)

CTCSS is also known by various trade names such as Private Line or PL (Motorola), Channel Guard (GE) and Quiet Channel (E.F. Johnson). CTCSS superimposes a sub-audible audio tone on a carrier for the purpose of eliminating co-channel interference. CTCSS tones are standardized by the Electronic Industries Alliance (EIA)/Telecommunications Industry Association (TIA) and may be listed in equipment manuals. The universal CTCSS is 156.7 Hz for analog systems.

ALL Montana mutual aid frequencies should be programmed using the CTCSS tone of 156.7 Hz on the *transmit* side.

In late 2012, a common transmit CTCSS tone of 156.7 Hz went into effect to protect law enforcement mutual aid channels in Montana from interference from adjacent users. Shortly there-after, Montana response agencies who regularly work near the North Dakota border were encouraged to add the CTCSS tone of 156.7 Hz on the *transmit* side of all of their mutual aid frequencies to enhance coordination with response agencies in neighboring states. That recommendation was made to eliminate the potential risk where Montana units transmitting without a tone cannot communicate with North Dakota units that are using CTCSS tone of 156.7 Hz on the *receive* side.

Network Access Codes (NAC) Codes

Network Access Codes (NAC) are similar to CTCSS tone control in analog radios, only they are used in Project 25 digital radios. NACs are programmed as a 3-digit hexadecimal code that is broadcast along with the digital signal being transmitted. The universal digital NAC code of $61F may be used on **BLUE (VLAW31)** and **BLACK** on an incident-specific basis in accordance with local law enforcement communication plans.

Mutual Aid Channel Summary

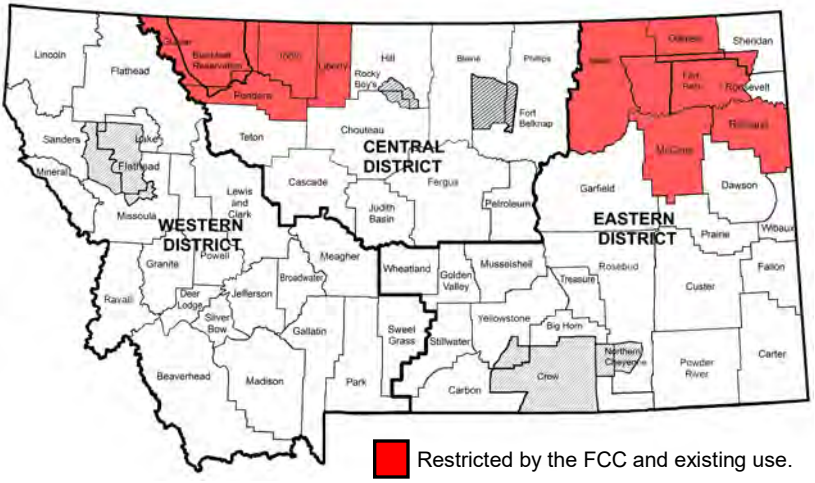
The following tables provide an overview of Montana's mutual aid frequencies starting with General Use frequencies and followed by those for the public safety disciplines of law enforcement, fire and EMS. SAR, Common and Cooperative frequencies are then summarized. The new Federal Incident Response and Law Enforcement Frequencies are provided in the next Section.

General Use Frequencies

Table 1: MT General Use Frequencies

Frequency (MHz)	Color Name & National Designator	Usage/Restrictions & Notes
153.9050	**GOLD**	**General Mutual Aid and Coordination** *For inter-disciplinary communications* • Available for mobile use (including portable) to any agency, organization, or individual with a legitimate public safety responsibility, including law enforcement, fire, ambulances, Search and Rescue (SAR) organizations and school buses. • Also available for low-powered base station licensure directly with the FCC for those eligible in the Local Government Radio Service (FCC §90.19a).
155.3400	**TAN (VMED28)**	**Primary Use: State Air-to-Ground Coordination** **Secondary Use:** Hospital-to-Ambulance or EMS interagency communications at incident scenes. **Restriction:** 10-Watt Airborne Limit restricted to under 5280 feet AGL altitude.
157.4250	**NEON**	**General Mutual Aid and Coordination** **Restrictions:** • 40-Watt Mobile Limit • Not available within 120 Km of Coutts, AB, including the following jurisdictions: Blackfeet Reservation and Glacier, Liberty, Pondera and Toole Counties. • Not available in: Daniels, McCone, Richland, Roosevelt and Valley Counties or on the Fort Peck Reservation. See Figure 3.

Figure 3: NEON Restriction Map



Tactical General Use Interoperability Channels

The following Tactical General Use Interoperability Channels are available for all law enforcement, fire, EMS and medical agencies including local, state, tribal and federal users. These channels are now licensed for both mobile and Fixed Base Mobile Relay Temporary (FB2T), which means they can be used in deployable repeaters. These frequencies are subject to the following usage restrictions:

- Require use of CTCSS tone 156.7 Hz on the Transmit (TX) side.
- 50-Watt Mobile Limit.
- Secondary status to existing co-channel and 7.5 kHz adjacent channels in areas where local agencies hold a valid FCC license.

Table 2: Tactical General Use Frequencies

Frequency (MHz)	Color Name & National Designator	Usage/Restrictions/ Notes
154.4525	**CHARLIE (VTAC12)**	**Tactical General Use Interoperability Channel** • Not available above Line A except at the Plentywood repeater site in Sheridan County. • Secondary status to existing co-channel and 7.5 kHz adjacent channels in the following counties: Broadwater, Cascade, Jefferson, Lewis and Clark, Mineral, Powell and Ravalli. See Figure 4.

Figure 4: CHARLIE (VTAC12) Restriction Map

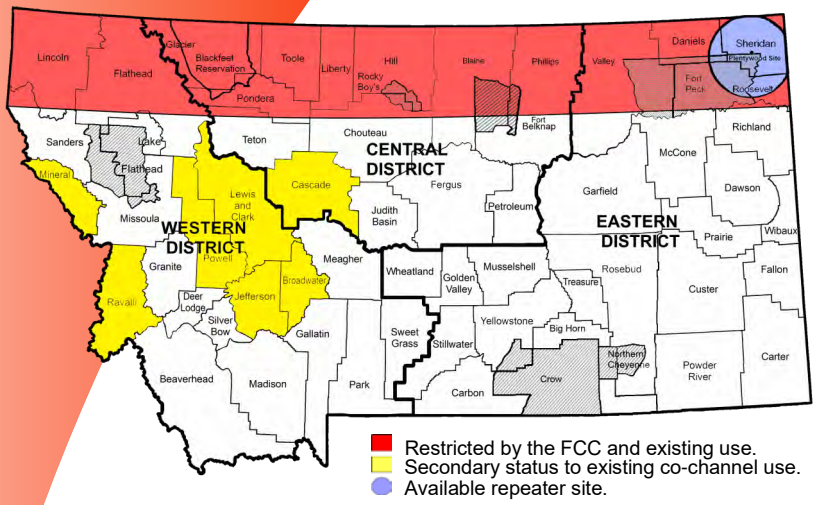


Table 2: Tactical General Use Frequencies *(continued)*

Frequency (MHz)	Color Name & National Designator	Usage/Restrictions/ Notes
155.7525	**DELTA (VCALL10)**	**Tactical General Use Interoperability Channel** • Not available above Line A or in Missoula County • Secondary status to existing co-channel and 7.5 kHz adjacent channels in the following areas: Flathead Reservation, Granite, Mineral, Powell, Ravalli and Sanders Counties. See Figure 5.
158.7375	**ECHO (VTAC13)**	**Tactical General Use Interoperability Channel** • Not available above Line A per FCC license except at these Interoperability Repeater Sites: **Highwood Baldy** (Chouteau County), **Mount Royal** (Liberty County), **SACO** (Phillips County) and **Windy Hill** (Roosevelt County/Fort Peck). • Not available in Flathead, Lake or Missoula Counties. • Secondary status to existing co-channel and 7.5 kHz adjacent channels in the following counties: Granite, Mineral, Powell, Ravalli, Sanders and within 20 km of Maverick Mountain in Beaverhead County. See Figure 6.

Figure 5: DELTA (VCALL10) Restriction Map

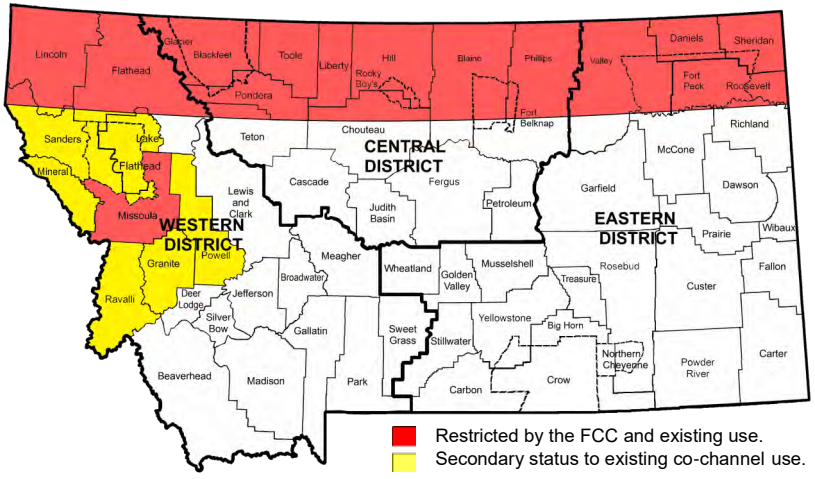


Figure 6: ECHO (VTAC13) Restriction Map

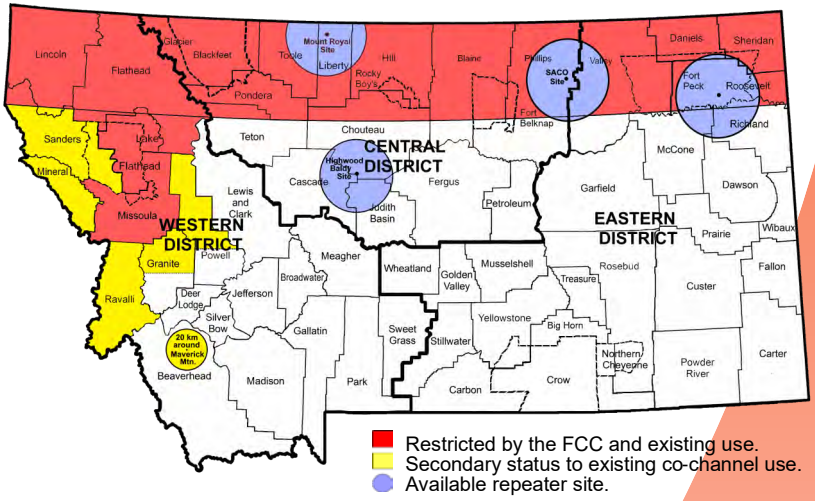


Table 2: Tactical General Use Frequencies *(continued)*

Frequency (MHz)	Color Name & National Designator	Usage/Restrictions/ Notes
159.4725	**FOX (VTAC14)**	**Tactical General Use Interoperability Channel** • Not available above Line A per FCC license. • Secondary status within 20 km of Maverick Mountain in Beaverhead County. See Figure 7.

Figure 7: FOX (VTAC 14) Restriction Map

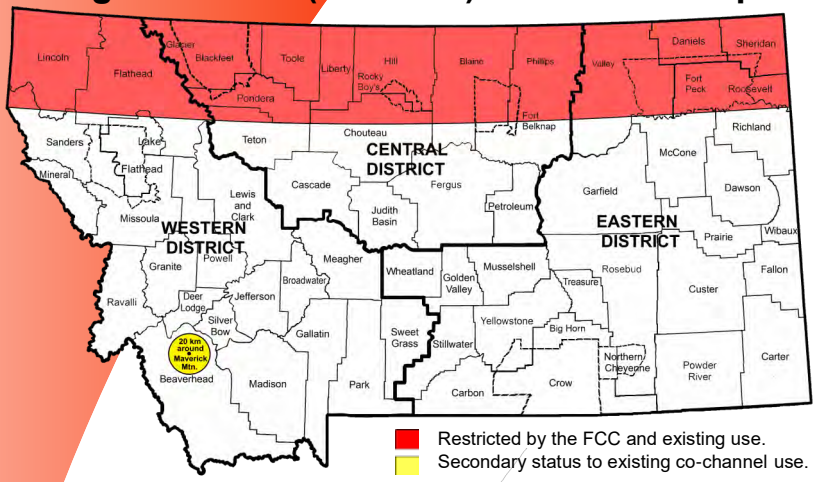
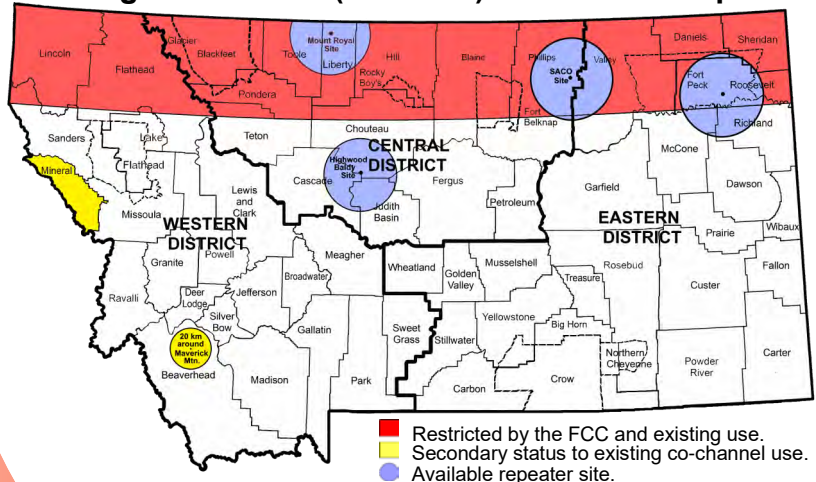


Table 2: Tactical General Use Frequencies *(continued)*

Frequency (MHz)	Color Name & National Designator	Usage/Restrictions/ Notes
151.1375	**GOLF (VTAC11)**	**Tactical General Use Interoperability Channel** • Not available above Line A per FCC license except at these Interoperability Repeater Sites: **Highwood Baldy** (Chouteau County), **Mount Royal** (Liberty County), **SACO** (Phillips County) and **Windy Hill** (Roosevelt County/Fort Peck). • Secondary status to existing co-channel and 7.5 kHz adjacent channels in Mineral County and within 20 km of Maverick Mountain in Beaverhead County. See Figure 8.

Figure 8: GOLF (VTAC 11) Restriction Map



Border Interoperability Frequency

The "Border Interoperability Channel" is a general purpose mutual aid interoperability channel for cross-agency use with Canadian responders operating within 16 km (10 mi) of the US-Canadian border. Types of agencies eligible to use this frequency were expanded to include local, state, tribal, federal and Canadian law enforcement, EMS and fire responders effective June 1, 2013.[1]

Here is a list of requirements for using the Border Interoperability Channel:

- For emergency, interagency use only.
- Law enforcement, fire and EMS agencies adjacent to or those that will potentially operate at or within 16 km (10 mi) of the U.S.-Canadian border may apply for a mutual aid permit to use 155.4750 MHz for cross-agency communications.
  - An online application may be completed at https://mutualaid.mt.gov for a new permit or to update an existing permit.
  - Use is not authorized until an approved mutual aid permit is issued.
- Statewide use of 155.4750 MHz outside of the 16 km (10 mi) of the U.S.-Canadian Border zone is restricted to law enforcement only.

Table 3: Border Interoperability Frequency

Frequency (MHz)	Color Name & National Designator	Usage/Restrictions/ Notes
155.4750	**BLUE (VLAW31)**	**General Purpose Border Interoperability Channel** • Uses the 155.4750 MHz frequency as a common resource for border incidents in Alberta, British Columbia, Montana and Saskatchewan. • Facilitates better and more efficient communications on cross-border incidents. • For all law enforcement, fire, EMS and public safety agencies including local, state, tribal, federal and Canadian users within 16 km (10 mi) of the US-Canadian border.

[1] The State of Montana petitioned the FCC to expand the purpose of the 155.4750 MHz frequency beyond law enforcement use along Montana's border with Canada. On December 10, 2012, the FCC adopted Order DA 12-1984 (http://www.fcc.gov/document/state-montana-0) in response to that petition.

Table 4: MT Mutual Aid Law Enforcement Frequencies

Frequency (MHz)	Color Name & National Designator	Usage/Restrictions/ Notes
155.4750	**BLUE (VLAW31)**	**National Law Enforcement Emergency**
155.7900	**SILVER**	**Law Enforcement Mutual Aid**
153.8000	**BLACK**	**Law Enforcement Tactical** • Approved digital and encrypted use with regional SOP. • Not to be used within 75 miles of the BLAIRMORE, HILLCREST & WARNER, ALBERTA areas per FCC license.

Table 5: MT Mutual Aid Fire Frequencies

Frequency (MHz)	Color Name & National Designator	Usage/Restrictions/ Notes
153.8300	**RUBY**	**State Fire Repeater (Output)** Meant to be paired with **GARNET** (159.3450) for mobile-repeater communications.
159.3450	**GARNET**	**State Fire Repeater Control (Input)** • Licensed for control station use. • Meant to be paired with **RUBY** (153.8300 MHz).
154.0700	**RED**	**State Fire Mutual Aid** • Should be the first choice for on-scene interagency communications. • Not to be used within 75 miles of Bow Island, Alberta per FCC license.
154.2800	**MAROON (VFIRE21)**	**State Command & Control** Primary use is for base-mobile communications for interagency dispatch and multi-agency command and control.
154.2650	**CORAL (VFIRE22)**	**State Fire Ground #1**

Table 5: MT Mutual Aid Fire Frequencies *(continued)*

Frequency (MHz)	Color Name & National Designator	Usage/Restrictions/ Notes
154.2950	**SCARLET (VFIRE23)**	**State Fire Ground #2**
154.2725	**COPPER (VFIRE24)**	**State Fire Ground #3** • Maximum mobile power is 100 watts ERP. • Secondary status to existing co-channel and 7.5 kHz adjacent channels in Gallatin County and parts of Meagher County. See map in Figure 9.

Figure 9: COPPER (VFIRE24) Restriction Map

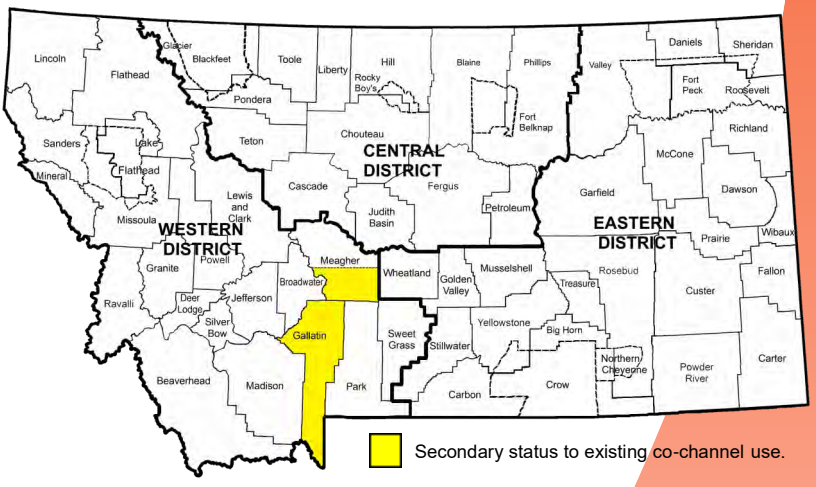
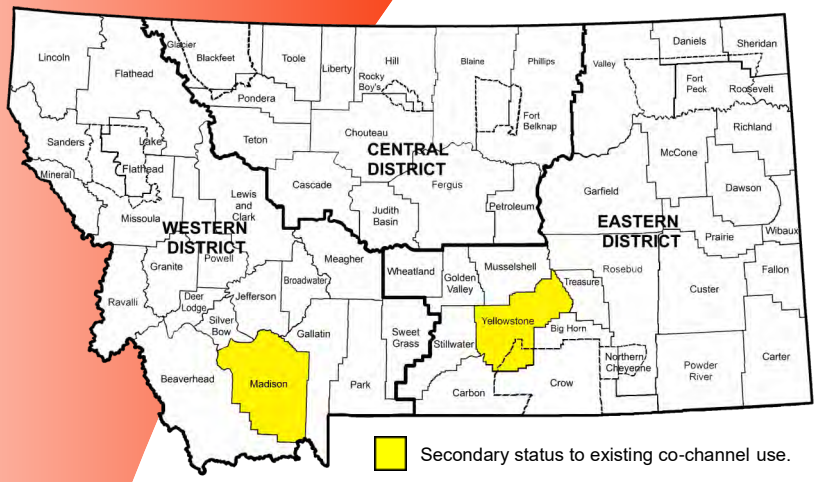


Table 5: MT Mutual Aid Fire Frequencies *(continued)*

Frequency (MHz)	Color Name & National Designator	Usage/Restrictions/ Notes
154.2875	**BURGUNDY (VFIRE25)**	**State Fire Ground #4** • Maximum mobile power is 100 watts ERP. • Secondary status to existing co-channel and 7.5 kHz adjacent channels in Madison and Yellowstone Counties. See map in Figure 10.

Figure 10: BURGUNDY (VFIRE25) Restriction Map

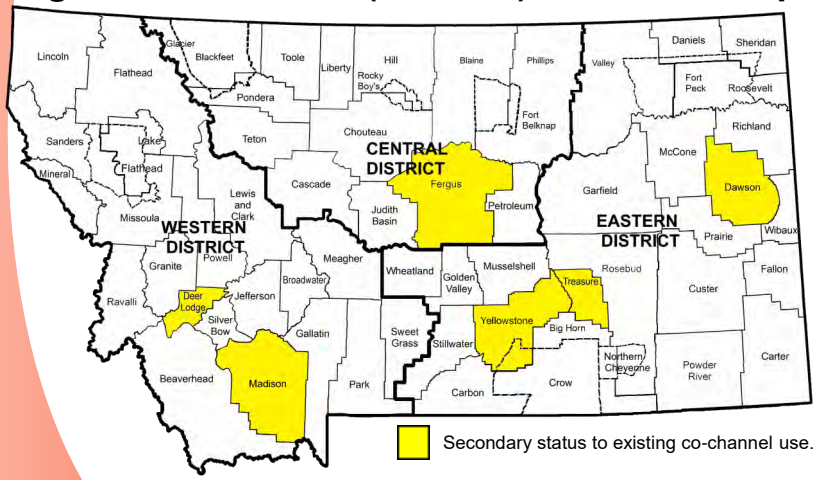


Secondary status to existing co-channel use.

Table 5: MT Mutual Aid Fire Frequencies *(continued)*

Frequency (MHz)	Color Name & National Designator	Usage/Restrictions/ Notes
154.3025	**CRIMSON (VFIRE26)**	**State Fire Ground #5** • Maximum mobile power is 100 watts ERP • Secondary status to existing co-channel and 7.5 kHz adjacent channels in Dawson, Deer Lodge, Fergus, Madison, Treasure and Yellowstone Counties. See map in Figure 11.

Figure 11: CRIMSON (VFIRE26) Restriction Map



Secondary status to existing co-channel use.

Table 5: MT Mutual Aid Fire Frequencies *(continued)*

Frequency (MHz)	Color Name & National Designator	Usage/Restrictions/ Notes
172.2250	**ALPHA**	**Interagency Fire Use Only** • 15-Watt Limit
172.3750	**BRAVO**	**Interagency Fire Use Only** • 15-Watt Limit

Table 6: MT Mutual Aid EMS Frequencies

Frequency (MHz)	Color Name & National Designator	Usage/Restrictions/ Notes
155.2800	**WHITE**	**Hospital-to-Ambulance and Hospital-to-Hospital Communications** Digital and encrypted allowed according to SOP.
155.3400	**TAN (VMED28)**	**Primary Use**: State Air-to-Ground Coordination. **Secondary Use:** EMS communications and medical staging at an incident scene. ***Airborne limit restricted to under 5280 feet AGL altitude.***
155.3250	**GRAY**	**Primary Use**: Central Region Dispatch & Paging **Secondary Use:** On-scene incident management per SOP *(Treatment Group)* Not to be used within 75 miles of Fort MacLeod, Alberta per FCC license
155.3850	**PINK**	**Primary Use**: Western/Eastern Region Dispatch & Paging **Secondary Use:** On-scene incident management per SOP *(Transport Group)*

Table 6: MT Mutual Aid EMS Frequencies *(continued)*

Frequency (MHz)	Color Name & National Designator	Usage/Restrictions/ Notes
157.4250	**NEON**	**General Mutual Aid and Coordination** **Note:** EMS Priority during mass-casualty incidents. On-scene incident management per SOP *(Triage Group)* • 40-Watt mobile limit • Not available within 120 km of Coutts, AB, including the following jurisdictions: Blackfeet Reservation and Glacier, Liberty, Pondera and Toole Counties. • Not available in: Daniels, McCone, Richland, Roosevelt and Valley Counties or on the Fort Peck Reservation. See Figure 3 for a map of these restrictions.

Table 7: SAR, SCHOOL, Common and Cooperative Frequencies

Frequency (MHz)	Color Name & National Designator	Usage/Restrictions/ Notes
155.1600	**VIOLET (VSAR16)**[2]	**National Search and Rescue** SAR Coordination Only
155.2200	**PURPLE**	**State Search and Rescue** SAR Coordination Only
155.1750	**SCHOOL**	**School Emergency** Used only during school emergencies to provide a direct communications link between the school and law enforcement.
155.8200	**BROWN**	**State DES Direction and Control** Use only per SOP or State DES approval
171.4750	**GREEN**	**State/Federal Common** This cooperative frequency may be used only for forest firefighting and conservation activities. It also must be coordinated with the U.S. Dept. of Agriculture.

[2] Consistent with NIMS principles, the APCO/NPSTC Standard Channel Nomenclature has been used as the source for the new **VSAR16** federal channel name.

Part III: Federal Interoperability Frequencies

Introduction and Purpose

The State of Montana and the U.S. Department of the Interior (DOI) signed a Memorandum of Understanding (MOU) to allow Montana's first responders to utilize radio frequencies that are normally set aside for national interoperability between agents of the U.S. Federal Government. These frequencies are designated for Inter-agency Law Enforcement and Incident Response operations. The State of Montana licensed these frequencies under Call Sign WRFP817. As a result of this MOU and license, more than 40 frequencies are now available to provide efficient, cost effective radio communications that support the protection of life and property.

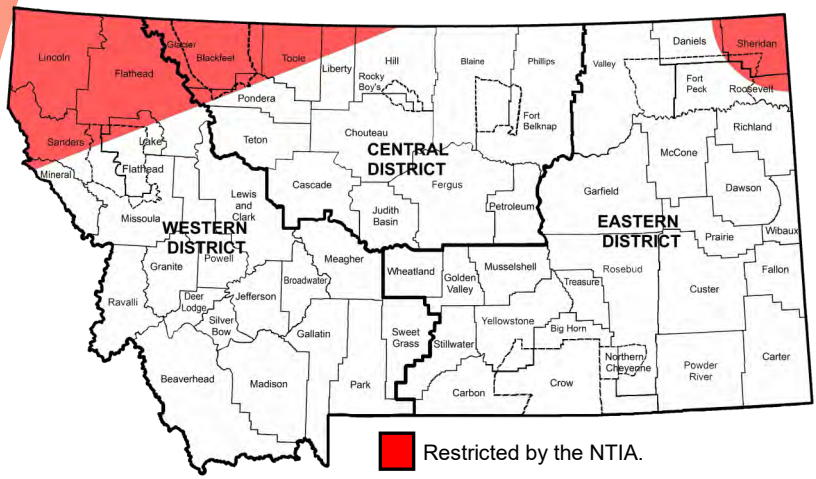
Public safety agencies at all levels of government in Montana may use these channels as long as they abide by the following conditions:

1. These channels are restricted to interoperability communications and are not authorized for routine or administrative uses as defined by the NTIA Manual.
2. These channels are available to non-Federal entities to enable joint Federal/non-Federal operations for law enforcement and incident response, subject to the condition that harmful interference will not be caused to Federal stations.
3. Certain channels have restricted areas of use in Montana, primarily near the Canadian border. Maps of these restricted areas are presented in Tables 8 and 10 to make it easier for first responders to determine where the frequencies can and cannot be used.
4. Extended operations and congestion may lead to frequency conflicts. Coordination with NTIA (through the U.S. Dept. of the Interior) is required to resolve these conflicts.
5. Only narrowband emissions are to be used.
6. Frequencies may not be provisioned or used in any permanent infrastructure.
7. Additional conditions for use are listed on Pages 19-21 in the January 2019 edition of the National Interoperability Field Operations Guide (NIFOG).

Table 8: Federal Interoperability Law Enforcement (LE) Restrictions

Channel	Frequency	Exclusion
LE 1	162.0875	Not available above Line A (See map on Page 9, Figure 2.)
LE 2	162.2625	Not available in Glacier, Lincoln and Sheridan Counties and parts of Daniels, Flathead, Hill, Liberty, Pondera, Roosevelt, Sanders, and Toole Counties as well as the Blackfeet Reservation. See Figure 12.

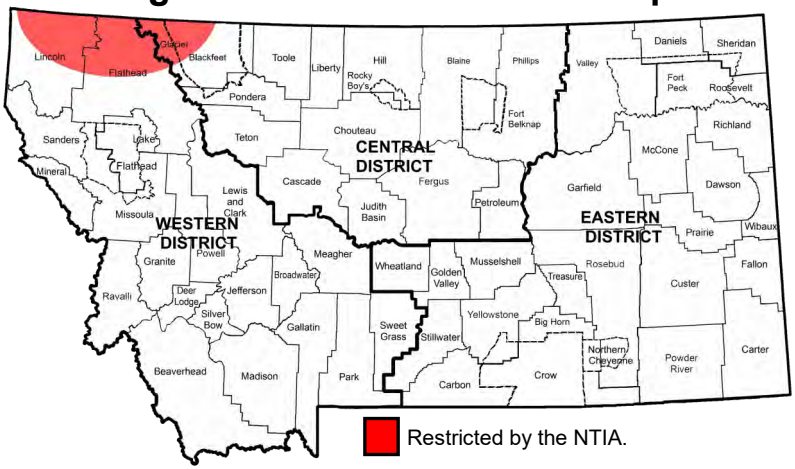
Figure 12: LE 2 and LE 4 Restriction Map



Channel	Frequency	Exclusion
LE 3	162.8375	Not available in the northern parts of Glacier, Flathead and Lincoln counties as well as the Blackfeet Reservation. See Figure 13.

Table 8: Federal Interoperability Law Enforcement (LE) Restrictions *(continued)*

Figure 13: LE 3 Restriction Map



Channel	Frequency	Exclusion
LE 4	163.2875	Not available in Glacier, Lincoln and Sheridan Counties and parts of Daniels, Flathead, Hill, Liberty, Pondera, Roosevelt, Sanders, and Toole Counties as well as the Blackfeet Reservation. See Figure 12.
LE 5	163.4250	Not available in Sheridan County or parts of Daniels and Roosevelt Counties. See Figure 14.

Figure 14: LE 5 Restriction Map

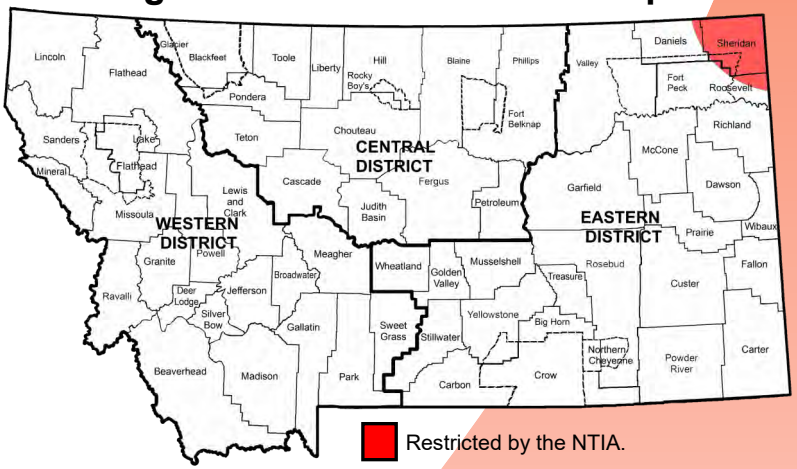


Table 8: Federal Interoperability Law Enforcement (LE) Restrictions *(continued)*

Channel	Frequency	Exclusion
LE 6	167.2500	Not available in parts of the Blackfeet Reservation and Flathead, Glacier, Lincoln and Sheridan Counties. See Figure 15.
LE 7	167.7500	Not available in parts of Daniels, Phillips, Sheridan and Valley Counties. See Figure 17.

Figure 16: LE 6 Restriction Map

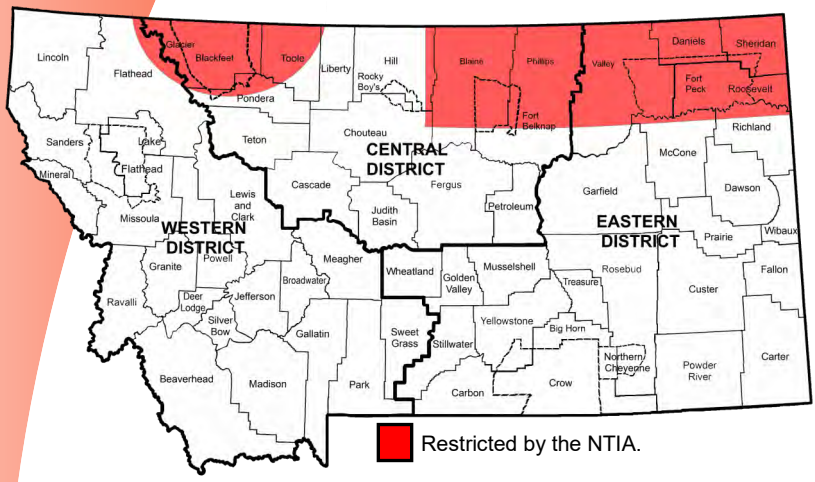


Figure 17: LE 7 Restriction Map

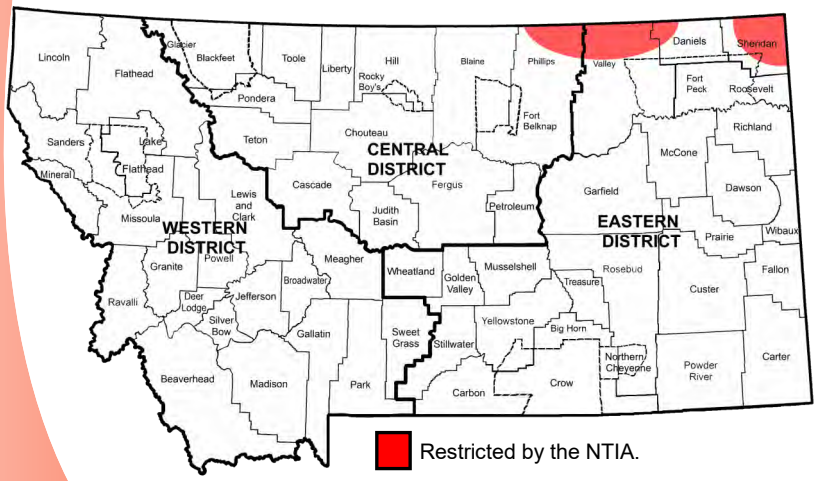


Table 8: Federal Interoperability Law Enforcement (LE) Restrictions *(continued)*

Channel	Frequency	Exclusion
LE 8	168.1125	Not available in the northern parts of Flathead, Glacier and Lincoln Counties. See Figure 16.
LE 9	168.4625	Not available above Line A or in most of the center portion of the state. See Figure 17.

Figure 16: LE 8 Restriction Map

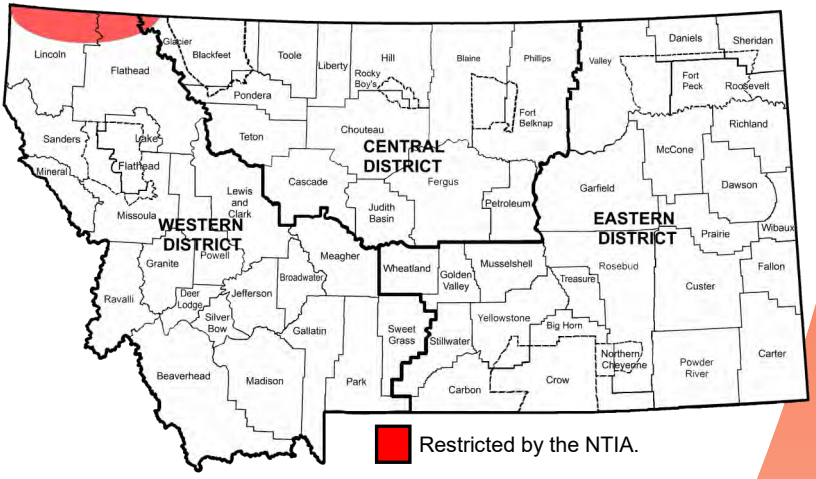


Figure 17: LE 9 Restriction Map

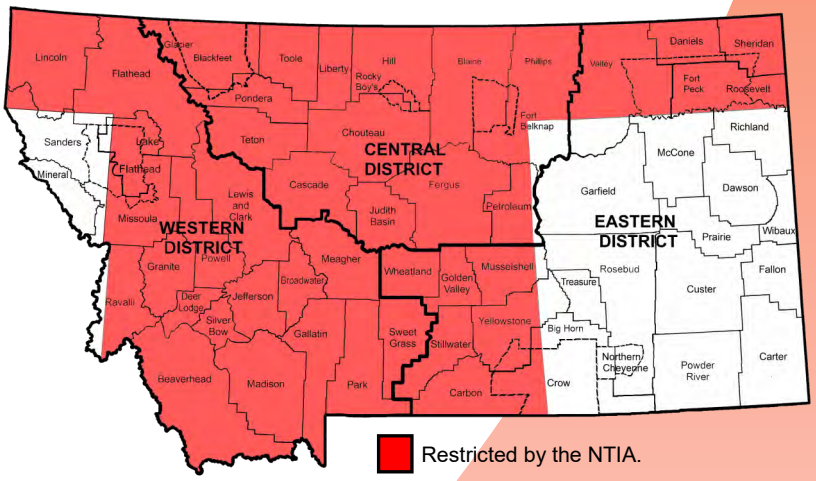


Table 9: Federal Interoperability Incident Response (IR) Restriction Maps

Channel	Frequency	Exclusion
NC 1 Calling	164.7125	Not available in the northwest corner of Lincoln County. See Figure 19.
IR 2	165.9625	Not available in the northeast corner of Sheridan County nor on the northern border and northeast corner of Lincoln County See Figure 20.

Figure 19: NC 1 Calling Restriction Map

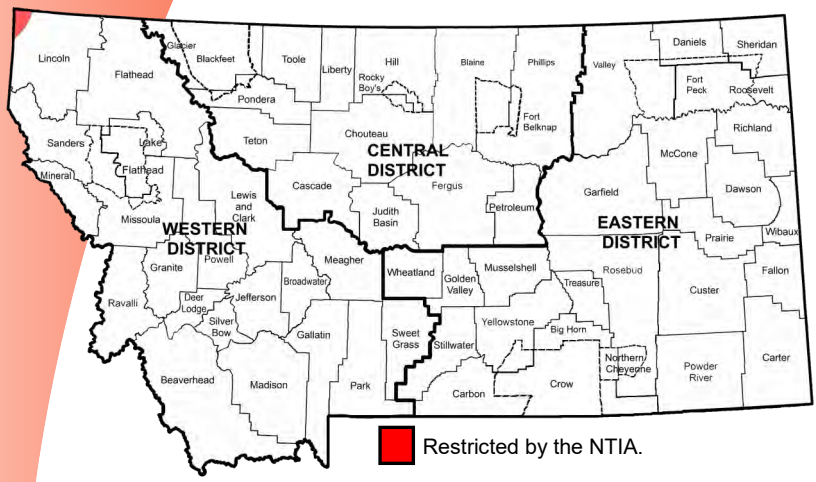


Figure 20: IR 2 Restriction Map

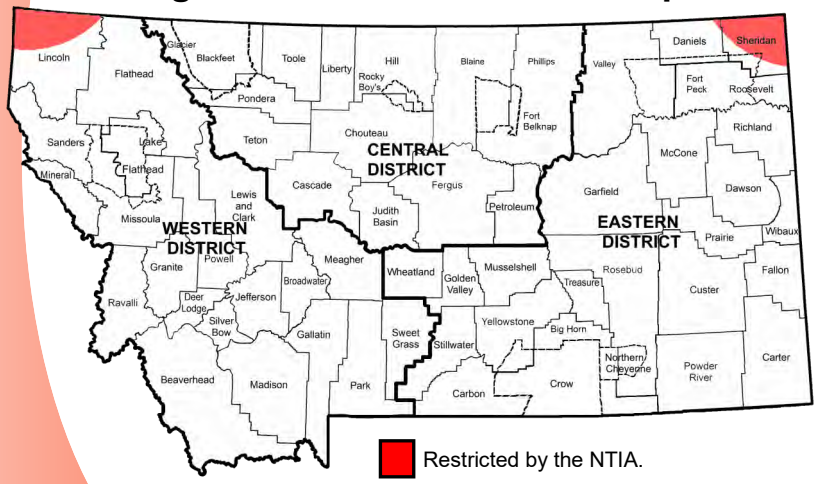


Table 9: Fed. Interop. Incident Response (IR) Restriction Maps *(continued)*

Channel	Frequency	Exclusion
IR 3	166.5750	Not available above Line A except in Lincoln County . See Figure 21.
IR 4	167.3250	Not available in parts of Blaine, Flathead, Glacier, Phillips, Roosevelt, Sheridan, Toole and Valley Counties as well as the Blackfeet and Fort Belknap Reservations. See Figure 22.

Figure 21: IR 3 Restriction Map

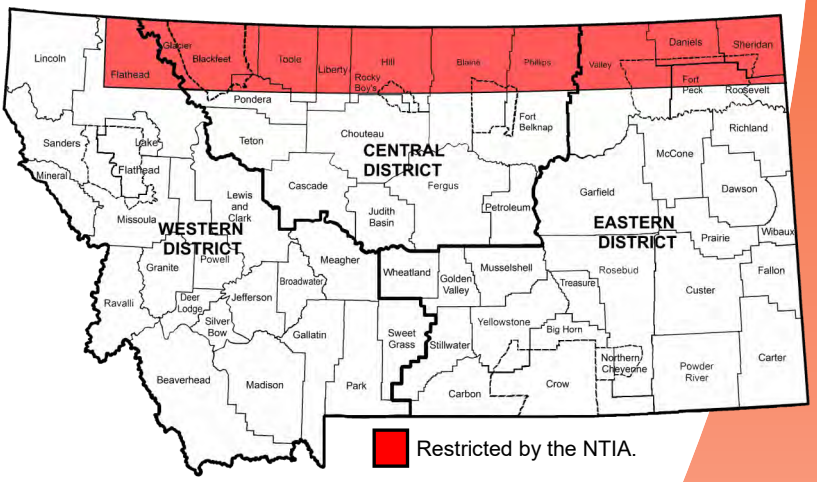


Figure 22: IR 4 Restriction Map

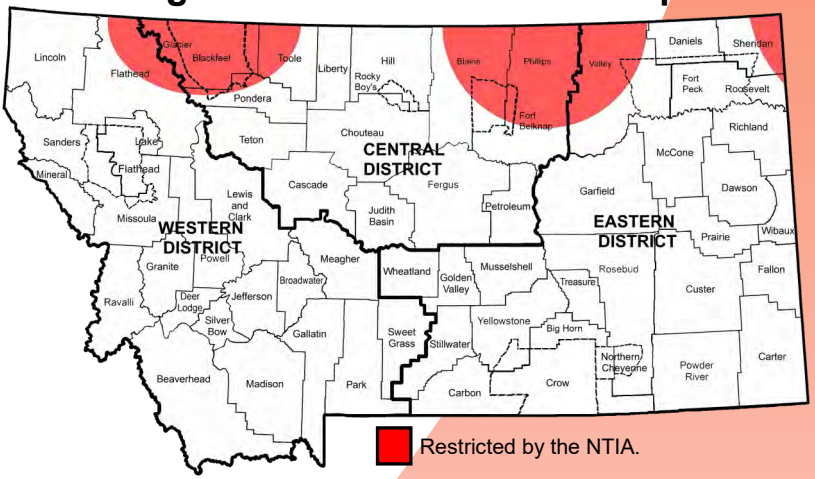


Table 9: Fed. Interop. Incident Response (IR) Restriction Maps *(continued)*

Channel	Frequency	Exclusion
IR 5	169.5375	Not available in Daniels County and parts of Glacier, Liberty, Pondera, Roosevelt, Sheridan, Toole and Valley Counties as well as the Blackfeet and Fort Peck Reservations. See Figure 23.
IR 6	170.0125	Not available in parts of Glacier, Flathead, Lincoln, Sheridan and Toole Counties as well as the Blackfeet Reservation. See Figure 24.

Figure 23: IR 5 Restriction Map

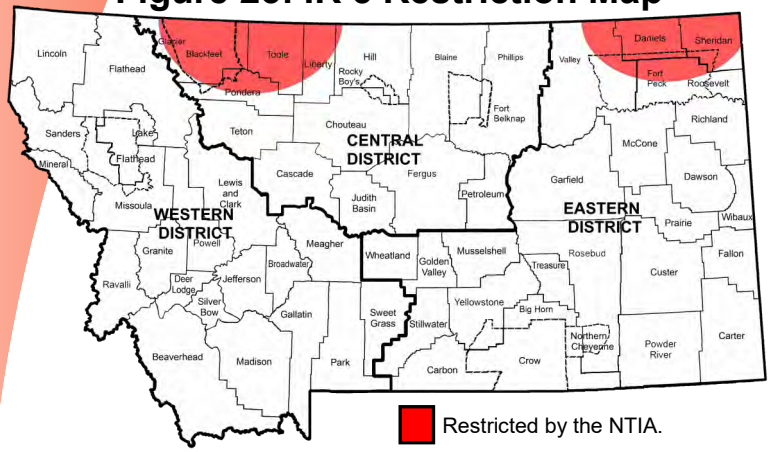


Figure 24: IR 6 Restriction Map

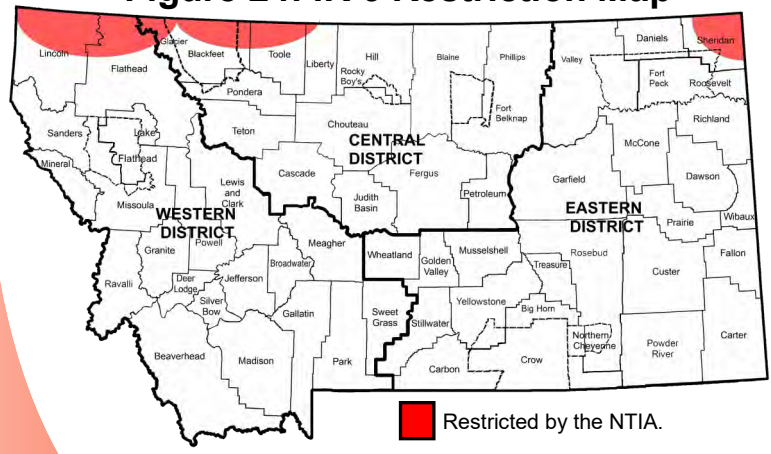


Table 9: Fed. Interop. Incident Response (IR) Restriction Maps *(continued)*

Channel	Frequency	Exclusion
IR 7	170.4125	Not available near the northern border with Canada in Phillips and Valley Counties and parts of Daniels and Sheridan Counties. See Figure 25.
IR 8	170.6875	Not available near the northern border with Canada in Flathead and Lincoln Counties and part of Glacier County. See Figure 26.

Figure 25: IR 7 Restriction Map

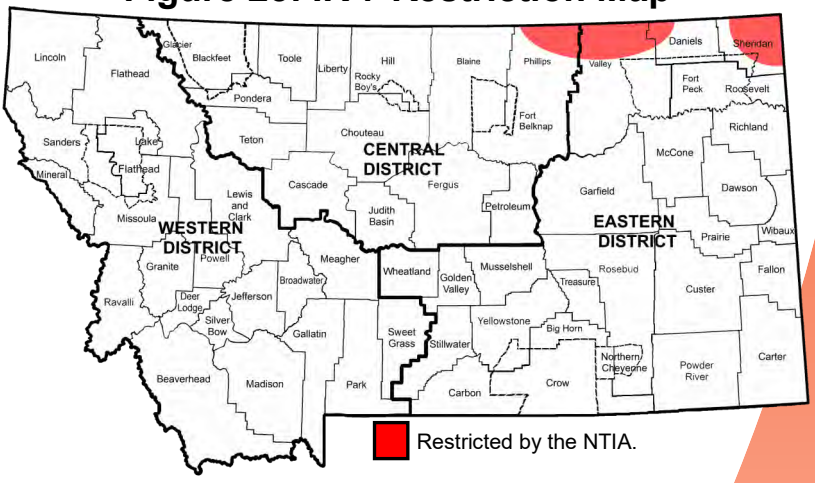


Figure 26: IR 8 Restriction Map

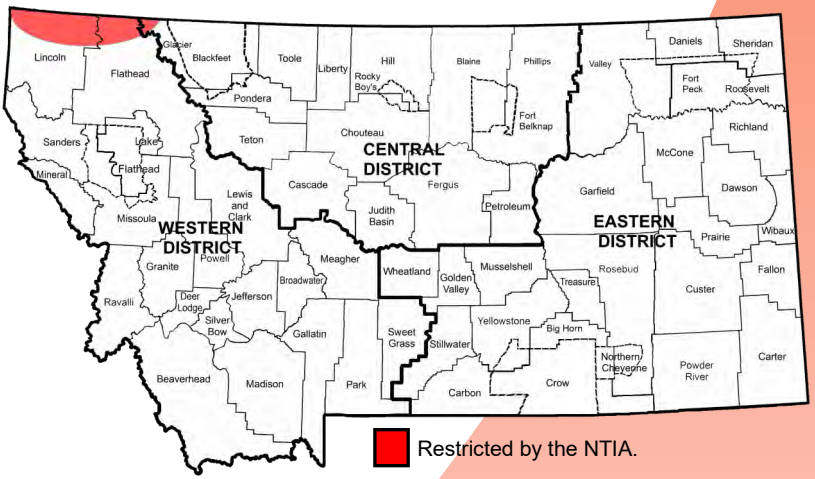
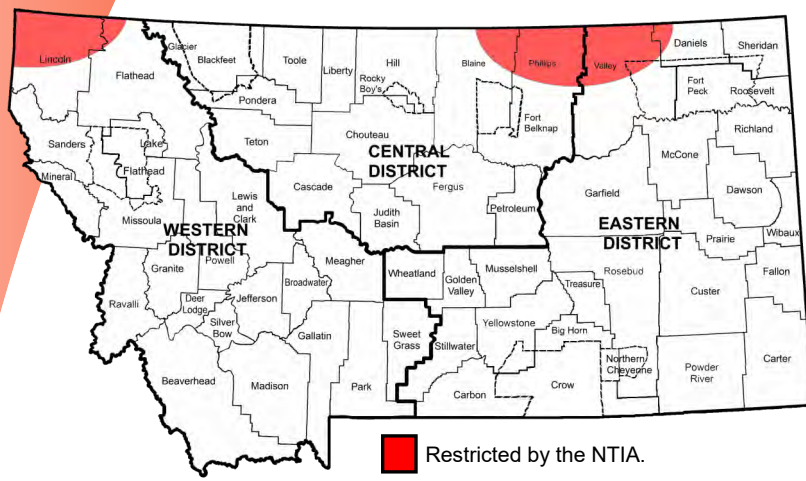


Table 9: Fed. Interop. Incident Response (IR) Restriction Maps *(continued)*

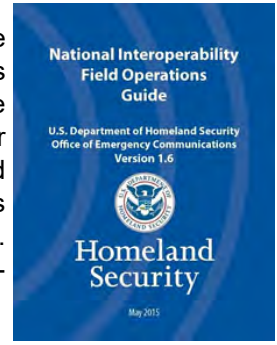
Channel	Frequency	Exclusion
IR 9	173.0375	Not available in parts of Blaine, Daniels, Flathead, Lincoln, Phillips and Valley Counties. See Figure 27.

Figure 27: IR 9 Restriction Map



Radio Programming Guides for LE and IR VHF Frequencies

Tables 10 and 11 are taken from the National Interoperability Field Operations Guide (NIFOG). They are meant to serve as a technical reference resource for emergency communications planning and for radio technicians responsible for radios that will be used in emergency responses. The online version is available at this website:



https://www.cisa.gov/publication/fog-documents

Table 10: VHF Law Enforcement (LE) Federal Interoperability Channel Plan

VHF Law Enforcement (LE) Federal Interoperability Channels					
Description	Channel Name	Note	Mobile RX (MHz)	Mobile TX (MHz)	CTCSS/ NAC
Calling	LE A	Analog	167.0875	167.0875 (S)	167.9 Tx, CSQ Rx
Tactical	LE 1	Analog	167.0875	162.0875	167.9 Tx, CSQ Rx
Tactical	LE 2		167.2500	162.2625	$68F ($1679_{10}$)
Tactical	LE 3		167.7500	162.8375	$68F ($1679_{10}$)
Tactical	LE 4		168.1125	163.2875	$68F ($1679_{10}$)
Tactical	LE 5		168.4625	163.4250	$68F ($1679_{10}$)
Tactical	LE 6	Direct for LE 2	167.2500	167.2500 (S)	$68F ($1679_{10}$)
Tactical	LE 7	Direct for LE 3	167.7500	167.7500 (S)	$68F ($1679_{10}$)
Tactical	LE 8	Direct for LE 4	168.1125	168.1125 (S)	$68F ($1679_{10}$)
Tactical	LE 9	Direct for LE 5	168.4625	168.4625 (S)	$68F ($1679_{10}$)

* CTCSS on receive only if user selectable; else CSQ.

Table 11: VHF Incident Response (IR) Federal Interoperability Channel Plan

VHF Incident Response (IR) Federal Interoperability Channels				
Suggested Assignment (Subject to availability & local plans)	Channel Name	Note	Mobile RX (MHz)	Mobile TX (MHz)
Incident Calling	NC 1	Calling	169.5375	164.7125
Incident Command	IR 1		170.0125	165.2500
Medical Evacuation Control	IR 2		170.4125	165.9625
Logistics Control	IR 3		170.6875	166.5750
Interagency Convoy	IR 4		173.0375	167.3250
Incident Calling (Direct)	IR 5	Direct for NC 1 Calling	169.5375	169.5375 (S)
Incident Command (Direct)	IR 6	Direct for IR 1	170.0125	170.0125 (S)
Medical Evacuation Control (Direct)	IR 7	Direct for IR 2	170.4125	170.4125 (S)
Logistics Control (Direct)	IR 8	Direct for IR 3	170.6875	170.6875 (S)
Interagency Convoy (Direct)	IR 9	Direct for IR 4	173.0375	173.0375 (S)

Default operation should be carrier squelch receive, CTCSS 167.9 transmit. If the user can enable/disable CTCSS without reprogramming the radio, the indicated CTCSS tone also could be programmed for receive, and the user instructed how and when to enable/disable.

Radio Programming Guides for LE and IR UHF Frequencies

UHF stands for Ultra High Frequency. The UHF band is situated between 300 and 3,000 MHz. Radio systems operating in the 806-824 MHz and 851-869 MHz portion of the UHF band are often referred to as “800 MHz systems.” The federal UHF public safety channels listed below—that Montana first responders now have access to—fall between 409 and 419 MHz. Once again, these channel plans are intended to be a technical reference resource for emergency communications planning and for radio technicians responsible for radios that will be used in emergency responses.

Table 12: UHF Law Enforcement (LE) Federal Interoperability Channel Plan

UHF Law Enforcement (LE) Federal Interoperability Channels					
Description	**Channel** Name	Note	**Mobile RX** (MHz)	**Mobile TX** (MHz)	CTCSS or NAC
Calling	LE B	Analog	414.0375	414.0375 (S)	167.9 Tx CSQ Rx
Tactical	LE 10	Analog	409.9875	418.9875	167.9 Tx CSQ Rx
Tactical	LE 11		410.1875	419.1875	$68F ($1679_{10}$)
Tactical	LE 12		410.6125	419.6125	$68F ($1679_{10}$)
Tactical	LE 13		414.0625	414.0625 (S)	$68F ($1679_{10}$)
Tactical	LE 14		414.3125	414.3125 (S)	$68F ($1679_{10}$)
Tactical	LE 15		414.3375	414.3375 (S)	$68F ($1679_{10}$)
Tactical	LE 16	Direct for LE 10 Analog	409.9875	409.9875 (S)	167.9 Tx CSQ Rx
Tactical	LE 17	Direct for LE 11	410.1875	410.1875 (S)	$68F ($1679_{10}$)
Tactical	LE 18	Direct for LE 12	410.6125	410.6125 (S)	$68F ($1679_{10}$)
CTCSS on receive only if user selectable; else CSQ.					

Table 13: UHF Incident Response (IR) Federal Interoperability Channel Plan

UHF Law Enforcement (LE) Federal Interoperability Channels					
Description	**Channel Name**	Note	**Mobile RX** (MHz)	**Mobile TX** (MHz)	CTCSS or NAC
Calling	LE B	Analog	414.0375	414.0375 (S)	167.9 Tx CSQ Rx
Tactical	LE 10	Analog	409.9875	418.9875	167.9 Tx CSQ Rx
Tactical	LE 11		410.1875	419.1875	$68F ($1679_{10}$)
Tactical	LE 12		410.6125	419.6125	$68F ($1679_{10}$)
Tactical	LE 13		414.0625	414.0625 (S)	$68F ($1679_{10}$)
Tactical	LE 14		414.3125	414.3125 (S)	$68F ($1679_{10}$)
Tactical	LE 15		414.3375	414.3375 (S)	$68F ($1679_{10}$)
Tactical	LE 16	Direct for LE 10 Analog	409.9875	409.9875 (S)	167.9 Tx CSQ Rx
Tactical	LE 17	Direct for LE 11	410.1875	410.1875 (S)	$68F ($1679_{10}$)
Tactical	LE 18	Direct for LE 12	410.6125	410.6125 (S)	$68F ($1679_{10}$)
CTCSS on receive only if user selectable; else CSQ.					

Part III: Law Enforcement

Introduction & Purpose

The law enforcement mutual aid system is an ongoing cooperative effort among law enforcement agencies to ensure an effective and organized response to a wide range of emergencies. This section outlines the policies and procedures for using Montana's law enforcement mutual aid radio frequencies. Purposes, eligibility, usage, codes, operations and requirements are covered.

Since law enforcement agencies are typically the center of public safety response in Montana, careful coordination of communications with other public safety agencies is needed. Often, law enforcement agencies need to allow other response agencies access to their systems for interoperability.

Mutual aid radio can help provide communications between different jurisdictions, types of responders and levels of government. It cannot, however, replace standard, "private" channels for common operational needs. For example, many county sheriffs work closely and regularly with city police within their jurisdictions. Sharing of their respective systems may be required for adequate coverage and accessibility. Mutual aid channels should be used to supplement these common operations, allow access for special incidents, and provide for critical backup.

Dispatch operations are appropriately conducted on "private" channels: not mutual aid. Only the Montana EMS Frequencies Plan (Part V) provides shared frequencies for dispatch and paging. If an agency or organization is regularly dispatched by a communications center, then a non-mutual aid channel should be available for this purpose. Although communications between a center and responders may be appropriately channeled to mutual aid frequencies during a response event, initial dispatch is not. Montana's mutual aid radio users are asked to conserve these resources to make them widely available when most needed.

FCC Eligibility Requirements

Police agencies seeking to use the Montana law enforcement mutual aid frequencies must meet FCC eligibility requirements as follows:

> FCC §90.20 (a) - Eligibility. (1) Any territory, possession, state, county, city, town or similar governmental entity is eligible to hold authorizations in the Public Safety Pool to operate radio stations for transmission of communications essential to official activities of the licensee, including: (ii) A governmental institution authorized by law to provide its own police protection.

Montana Law Enforcement Mutual Aid Frequencies

Three frequencies (**BLUE-VLAW31**, **SILVER** and **BLACK**) are established for law enforcement use and are summarized in Table 10 below. Two other frequencies, **GOLD** and **NEON**, are established for general public safety use, including law enforcement. All of these frequencies require the use of transmit CTCSS tone control of 156.7 Hz. Three classes of law enforcement mutual aid traffic described here are for emergency, administrative, and tactical communications.

Table 14: Montana Mutual Aid Law Enforcement Frequencies

Frequency (MHz)	Color Name & National Designator	Usage/Restrictions/Notes
Emergency Communications		
155.4750	**BLUE (VLAW31)**	**National Law Enforcement Emergency** Primary channel for law enforcement inter-agency emergency communications
Administrative Communications		
155.7900	**SILVER**	**Law Enforcement Mutual Aid** • Primary channel for law enforcement inter-agency administrative communications. • Used for dispatch-to-dispatch communications and tactical operations.
153.9050	**GOLD**	**General Mutual Aid and Coordination** Used for inter-disciplinary communications

Table 14: Montana Mutual Aid Law Enforcement Frequencies *(continued)*

Frequency (MHz)	Color Name & National Designator	Usage/Restrictions/ Notes
Administrative Communications (continued)		
157.4250	**NEON**	**General Mutual Aid and Coordination** • 40-Watt Mobile Limit • Not available within 120 km of Coutts, AB, including the following jurisdictions: Blackfeet Reservation and Glacier, Liberty, Pondera and Toole Counties. • Not available in: Daniels, McCone, Richland, Roosevelt and Valley Counties or on the Fort Peck Reservation. See Figure 3 on page 14.
Tactical Communications		
153.8000	**BLACK**	**Law Enforcement Tactical** • Established exclusively for law enforcement tactical team operations. • Approved digital and encrypted use with regional SOP. • Not to be used within 75 miles of the BLAIRMORE, HILLCREST & WARNER, ALBERTA areas per FCC license

Emergency Communications

Purpose

BLUE (**VLAW31**) is the primary channel for law enforcement interagency emergency communications. The purpose is to establish a statewide law enforcement emergency communications network under FCC Rules and Regulations, Part 90.20, using the frequency 155.4750 MHz.

BLUE (VLAW31) is used for initial contact on matters of a routine nature. Short, infrequent transmissions make it most available for sudden emergency traffic. It must be monitored widely to be of most value.

In instances where continued or tactical interagency communications are needed at an incident, initial contact may be made on the **BLUE (VLAW31)** channel and responders instructed to move to the **SILVER** channel. For example, at a vehicular accident scene, **BLUE (VLAW31)** could be used to summon other law enforcement responders and direct them to **SILVER** for continued operations. If necessary, emergency operations may be conducted on the **BLUE (VLAW31)** channel, but an attempt should be made to off-load them as much as possible for other sudden emergencies.

Eligibility

Here are the entities and eligible uses for the **BLUE (VLAW31)** channel within Montana. Additional rules and regulations affecting eligibility may be established by DOJ in consultation with state, local, tribal or federal public safety agencies.

- **State of Montana**: The State of Montana, DOJ, shall maintain a statewide mobile license for this frequency to allow other eligible users mobile and/or temporary base station access by application for and approval of a mutual aid permit. DOJ shall maintain all base station authorizations on behalf of local agencies on this frequency under its Federal Registration Number (FRN).
- **Law Enforcement**: Except for itinerant federal law enforcement vehicles, a law enforcement agency must be a licensee in the police or local government radio service in order to be eligible to use this frequency.
    - **Bases**: Any law enforcement agency in the state that meets the above conditions shall be eligible to obtain base station authorization under the DOJ's license on this frequency, subject to applicable FCC Rules and Regulations. ***All 24-hour law enforcement communications centers are encouraged to install bases on 155.4750 MHz.***
    - **Mobile**: Any law enforcement agency may apply for a mutual aid permit with DOJ to be included under its mobile license.

- **Buses:** Bus services were provided with special access on the **BLUE (VLAW31)** channel to communicate directly with law enforcement because they frequently cross jurisdictional boundaries and may need contact with a variety of law enforcement agencies or dispatch centers.

Buses may use the **BLUE (VLAW31)** channel only during a locally declared disaster or emergency as specified in a jurisdiction's Emergency Operations Plan or a state or federally declared disaster or emergency.

Other restrictions are:

- The bus service must be included in the local/regional Emergency Operations Plan.
- The bus service must provide student transportation for recognized Montana school districts, colleges, universities, or local government entities. Private bus contractors may operate under a district's authorization while serving that district.
- A school district or school transportation contractor must hold a valid mutual aid permit from DOJ for statewide mobile use of the **BLUE (VLAW31)** channel in its buses.
- Access must be authorized by the district's local sheriff.
- Under no circumstances may school district base stations be operated using the **BLUE (VLAW31)** frequency.
- Administrative bus traffic is not allowed on ANY mutual aid channel.
- **Note**: If a bus driver needs to interface with public safety officials, **GOLD** is the recommended channel.
- The **SCHOOL** mutual aid emergency channel is to be used only during school emergencies to provide a direct communications link between the school and law enforcement.

- **Ambulances:** Ambulance services also are allowed special access on **BLUE (VLAW31)** provided they are licensed by the EMS & Trauma Systems Section of the Department of Public Health and Human Services (DPHHS). Access to the **BLUE (VLAW31)** channel is not intended for all EMS providers nor is it intended as a substitute for local operational channels. Ambulance services must hold a valid mutual aid permit from DOJ to be included under its mobile license for statewide use of the **BLUE (VLAW31)** channel.

- **EMS and Fire Responders Operating within 16 km (10 mi) of the US-Canadian Border:** The "Border Interoperability Channel" is a general purpose mutual aid interoperability channel for cross-agency use with Canadian responders operating within 16 km (10 mi) of the US-Canadian border. Types of agencies eligible to use this frequency were expanded to include local, state, tribal, federal and Canadian law enforcement, fire, EMS and other responders effective June 1, 2013.

Frequency Usage

The Montana law enforcement emergency communications network is established exclusively for interagency emergency and itinerant law enforcement communications.

Administrative Communications

Purposes

The **SILVER** channel is established as the primary frequency for law enforcement interagency administrative communications. It is used for dispatch-to-dispatch communications and tactical operations. **GOLD** and **SILVER** are established in accordance with FCC Rules and Regulations, Part 90.20, using the frequencies 153.9050 MHz (**GOLD**) and 155.7900 MHz (**SILVER**).

Note: SILVER is not regularly used in the City of Billings due to interference problems.

The **GOLD** channel is for inter-disciplinary communications (law enforcement-fire, local law enforcement-Montana Highway Patrol, etc.). It is used for both emergency and administrative (non-emergency) traffic, subject to priority use levels. Administrative traffic is appropriately carried on **SILVER** or **GOLD** channels unless preempted by a higher priority need. (See Priority Use Levels in Part X).

Eligibility

Here are the entities and eligible uses for the **SILVER** channel within Montana, subject to applicable FCC Rules and Regulations. Additional rules and regulations affecting eligibility may be established by DOJ in consultation with state, local, tribal or federal public safety agencies.

- **State of Montana:** DOJ shall maintain a statewide mobile license for this frequency to allow other eligible users mobile access by agreement. It may license base stations on this frequency for state law enforcement agency use consistent with the plan outlined in this manual.

- **Law Enforcement:** Except for itinerant federal law enforcement vehicles, a law enforcement agency must be a licensee in the Police or Local Government radio service to be eligible to use this frequency.

    1. **Bases:** Any law enforcement agency in the state meeting the above conditions and having a base station installed on the frequency 155.4750 MHz shall be eligible to license a base station on this frequency.

    2. **Mobile:** Any law enforcement agency in the state meeting the above conditions shall be eligible to obtain a mobile license on this frequency for use within its jurisdiction. Law enforcement agencies may apply for a mutual aid permit with DOJ for statewide mobile use authorization.

Frequency Usage

The Montana law enforcement mutual aid frequency **SILVER** is established exclusively for law enforcement dispatch-to-dispatch communications and tactical operations.

1. **Itinerant Traffic:** Itinerant traffic such as between a prisoner transport vehicle and a communications center enroute should be carried on the **SILVER** channel. If necessary, initial contact may be made on the **BLUE (VLAW31)** channel, but it should be transferred as soon as possible to **SILVER** where administrative and tactical traffic is appropriate.

2. **Point-To-Point:** The **SILVER** channel may also be used for point-to-point (base-to-base) communications. FCC §90.417 authorize interstation communications between different licensees "when the communications involved relate directly to the imminent safety of life or property." **SILVER** also is available on a secondary basis for base-mobile or mobile-mobile operations.

   Agencies must license their own base stations on the **SILVER** channel. DOJ maintains a statewide mobile license for this frequency and can directly authorize mobile use via a mutual aid permit. However, authorization by permit is not available for base station installations. Licensure by agencies is subject to coordination by by the Association of Public Safety Communications Officials (APCO) and is contingent upon prior installation of a **BLUE (VLAW31)** base station.

   As coordinator of police and local government frequencies in the state, APCO may recommend changes to limit range or harmful interference potential. DOJ will arbitrate if APCO and the applicant agency cannot find a mutually acceptable solution.

No special technical restrictions are established for **SILVER** base stations, but agencies making application should design their systems to minimize nuisance interference. Sub-audible tone selection of receivers outside of the established mutual aid tone of 156.7 Hz on the transmit side is not allowed for law enforcement mutual aid frequencies.

Tactical Communications

Purpose

The **BLACK** channel is established only for interagency, law enforcement tactical team communications within Montana; other use is strictly prohibited. It is established by authority of Montana Codes Annotated §2-17-544 and in accordance with FCC Rules and Regulations, Part 90.20, using the frequency 153.800 MHz.

The **BLACK** channel is not available for base station use and is intended primarily for portable-to-portable communications, but it may be placed in mobiles that support coordination of tactical operations (e.g. command post vehicles).

Eligibility

Here are the entities and eligible uses for the **BLACK** channel within Montana, subject to applicable FCC Rules and Regulations. Additional rules and regulations affecting eligibility may be established by DOJ in consultation with state, local, tribal or federal public safety agencies.

- **State of Montana:** The State of Montana, DOJ, shall maintain a statewide mobile license for this frequency to allow other eligible users mobile access by agreement.
- **Law Enforcement:** Except for itinerant federal law enforcement units, a law enforcement agency must be a licensee in the Police or Local Government FCC radio service to be eligible to use this frequency.
  - **Bases:** No permanent base stations are allowed on this frequency for mutual aid use.
  - **Mobile:** Any law enforcement agency in the state meeting the above conditions may enter into agreement with the State of Montana for authorization under its mobile license.

Frequency Usage

The Montana law enforcement tactical team coordination frequency **BLACK** is established exclusively for law enforcement tactical team operations. It is intended for use in portable radios and may only be used in vehicular radios in support of tactical team operations.

Encryption

In general, the use of any mutual aid channel for transmission of any encoded, encrypted, digital, or scrambled message is prohibited. One exception, however, is with the **BLACK** channel where encryption may be utilized in accordance with law enforcement communication plans. At times, sensitive radio transmissions need to be protected when disclosure of the information could adversely impact public safety operations and/or pose a threat

to first responders or members of the public. As a result, Montana's digital radio system is equipped with Data Encryption Standard (DES-OFB) encryption capabilities with plans to move to the Advanced Encryption Standard (AES-256) in the future.

Montana Code Annotated (MCA) 44-5-501 et seq. establishes the Department of Justice (DOJ) as the state agency responsible for criminal justice information system security. DOJ authorizes the Montana Highway Patrol (MHP) to protect radio transmissions of criminal justice information from unauthorized use by the adoption of statewide encryption procedures. MHP retains the law enforcement system-wide encryption key reference, which is known as a Common Key Reference (CKR). MHP supports encryption operations by generating, distributing, storing, destroying and maintaining encryption materials.

Individual tactical teams around the state are discouraged from creating their own encryption keys because this practice reduces interoperability and negates much of the rationale behind mutual aid. Law enforcement agencies need to carefully coordinate their communications, including encryption practices, with other public safety agencies to ensure interoperability, especially on larger incidents. If a major event requires joint tactical use, coordination will be essential.

CTCSS and NAC

As stated previously, all mutual aid law enforcement frequencies require the use of transmit CTCSS tone control of 156.7 Hz. NAC code $293 on **BLUE (VLAW31)** and **BLACK** has been authorized for use on an incident-specific basis in accordance with local law enforcement communication plans.

Operations & Permissible Uses

The following operational requirements and procedures are established to make the most effective use of the Montana law enforcement mutual aid frequencies.

A mutual aid permit as used in this section includes any formal agreement adopted by DOJ for use with mutual aid radio frequencies. Nothing in this section should be construed as prohibiting the installation of any frequency for receive-only operations (monitoring).

Before commencing operations, law enforcement agencies seeking to install a base station on the **BLUE (VLAW31)** frequency must have a valid mutual aid permit from DOJ and post a copy of the State's FCC license covering the installation as required by FCC §90.437. Agencies are bound by the terms of the mutual aid permit to all applicable FCC rules and regulations.

Law enforcement agencies seeking to install a base station on the **SILVER** frequency must have an FCC license authorizing such installation before commencing operations. Agencies are bound by law to all applicable FCC rules and regulations.

Law enforcement agencies seeking to use the **BLUE (VLAW31), SILVER, or BLACK** channels in mobile or portable radios must hold a valid a mutual aid permit from DOJ before commencing operations. Alternately, an agency may license the **SILVER** frequency directly with the FCC for mobile use within its jurisdiction.

Three usage classes are presented in Table 15 with their permissibility. All communications are considered two-way.

Table 15: Usage Classes

Mutual Aid Channel	Base - Mobile	Base - Base	Mobile - Mobile
BLUE (VLAW31)	YES	NO	YES
SILVER	YES (secondary)	YES	YES (secondary)
BLACK	NO	NO	YES

Frequency Monitoring

Users of any mutual aid frequency are required to monitor the frequency prior to transmitting to detect higher priority traffic. When need be, an "EMERGENCY TRAFFIC" interruption or "EMERGENCY TRAFFIC ONLY" broadcast may be made.

Agencies with BLUE (VLAW31) base stations installed must monitor the frequency at all times when their facility is operational. A separate receiver for this frequency is encouraged to prevent other traffic or transmissions from covering its reception. Mobile monitoring of the channel at all times by all users is encouraged as well.

Itinerant Services: All users of these frequencies must render service to itinerant vehicles on the frequencies because such traffic relates to the provision of public safety.

Oversight & Discipline

The policies and procedures established here, combined with FCC Rules and Regulations: Part 90, compose the usage guidelines for the Montana law enforcement mutual aid system. DOJ in consultation with other public safety agencies is vested with the authority to deal with frequency disputes.

Incident Communications Plans

The Incident Communications Plans suggested in this *Mutual Aid Manual* are based on the set of best practices for responding to emergencies known as the Incident Command System (ICS). ICS provides standardized response and operational procedures to reduce problems and potential for miscommunication on incidents of all types and complexities. The use of a common communications plan is essential for ensuring that responders can communicate with one another during an incident. Please note that the incident communications planning discussed in this section only addresses law enforcement and does not attempt to cover all the resources available within any given jurisdiction. For more information about ICS, please see Appendix A.

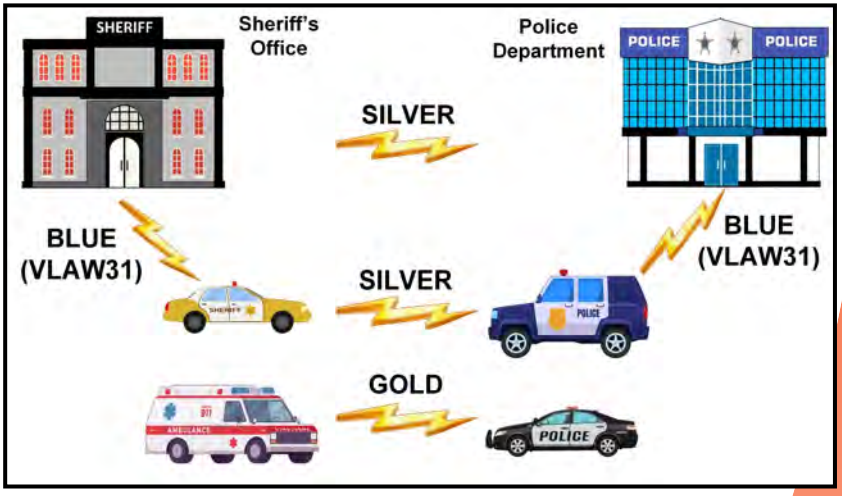
1. Basic Interagency Operations

Basic interagency law enforcement operations are conducted on the **SILVER** channel. As noted previously, use of the **BLUE (VLAW 31)** channel should be limited to interagency emergency and base-mobile communications. It may be used for initial contact on non-emergency matters, but traffic should be switched as soon as possible to one of the tactical mutual aid (**SILVER**, usually, for law enforcement) or local common coordination channels, if available.

While the **GOLD** channel (State Common Mutual Aid) has been used a great deal in the past for law enforcement-to-law enforcement traffic, it should be reserved for inter-discipline communications where it is likely the only shared frequency. Ambulances and public bus service providers have been given access to the **BLUE (VLAW 31)** channel for emergency contacts with law enforcement base stations, but are expected to use the **GOLD** channel otherwise.

A basic communications plan for law enforcement would have agencies using their own channel(s) between their own units, the **SILVER** channel for contact between like units (mobile-mobile, base-base), the **BLUE (VLAW 31)** channel for interagency base-mobile contacts, and the **GOLD** channel for inter-discipline mobile-mobile communications. Graphically, it may be depicted as appears in Figure 28.

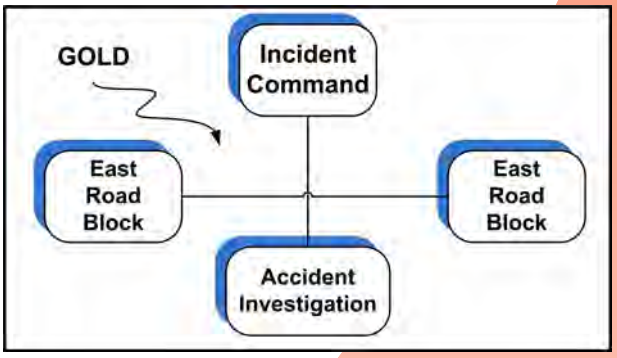
Figure 28: Basic Interagency Operations



The agencies' own communications channels are not diagrammed here and some complementary lines (e.g. ambulance to sheriff's office mobile) are left out for the sake of clarity.

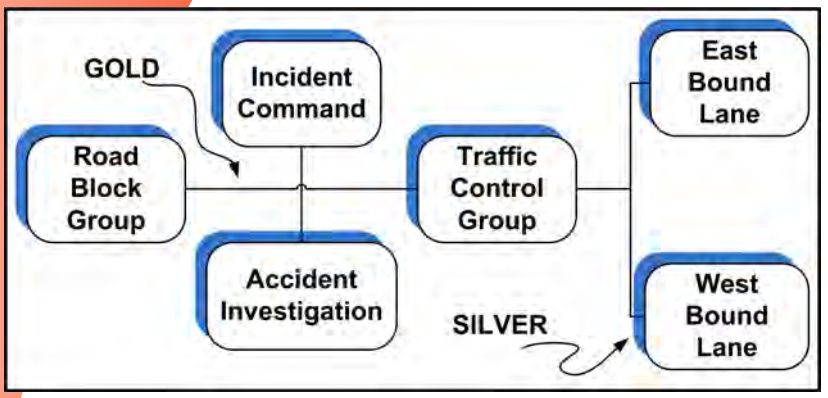
When an Incident Commander (IC) is designated during an event or operation, it is useful to have a separate net for command communications. This net would be used for direct control of operational elements during a simple incident. For an example, see Figure 29.

Figure 29: Separate Net for Command Communications



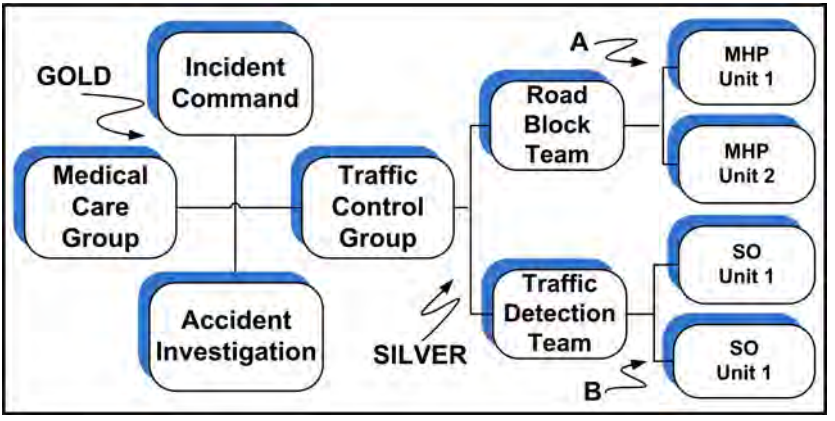
The **SILVER** channel could be used for the command net during purely law enforcement operations, but use of the **GOLD** channel will simplify expansion of a communications plan in the likely event that other types of public safety services are needed. **SILVER** could be retained for interagency tactical communications, such as in Figure 30.

Figure 30: Law Enforcement Command Net



When multiple units of an agency are involved, one of that agency's working channels becomes (or remains) its tactical channel. For example, see Figure 31 where A and B are the agencies' own working channels.

Figure 31: Command Net with Multiple Agencies



A simple incident where a single ambulance or highway sander, for example, is also involved is easily handled by placing it on the command net (**GOLD**). If the situation expands much beyond that, a more complex plan is needed.

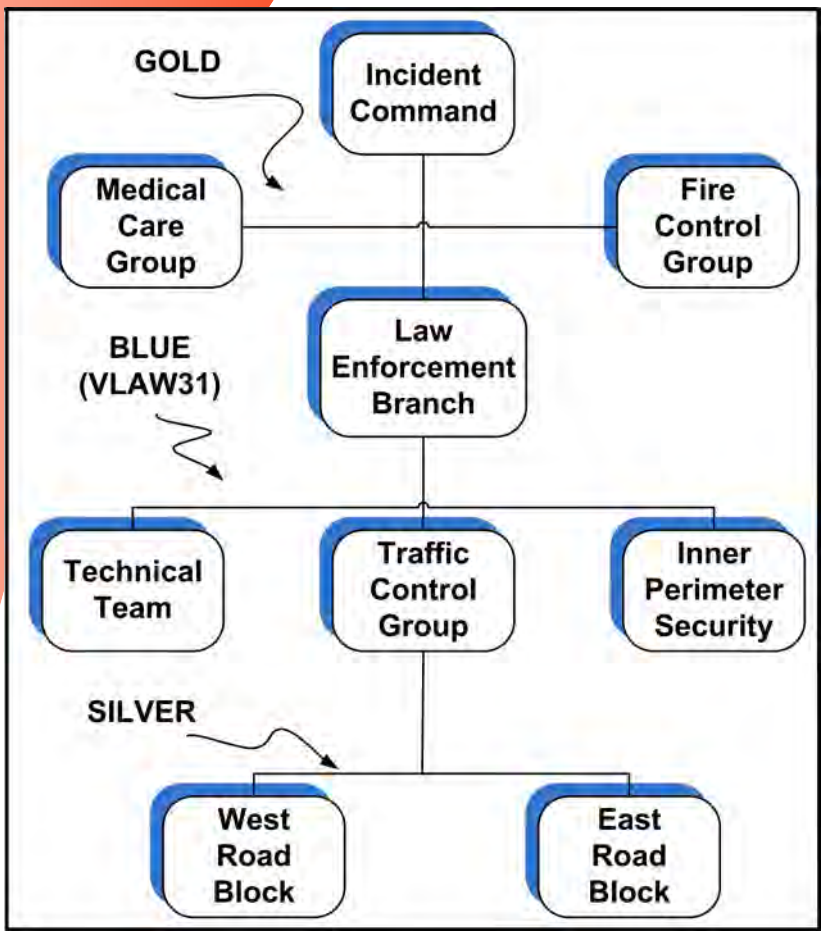
2. Extended Incidents

Extended incidents require both more formal communications plans and a broader network to cover a variety of response agencies. No mutual aid radio plan will be able to provide all the communications necessary in a large incident where police, fire, EMS, search and rescue, and road maintenance workers among others may converge. Communications pre-planning, taking into account all available resources, is essential for adequate response to such emergencies. Through this process, a formal plan can be developed that puts mutual aid radio to best use.

A generalized mutual aid plan establishes the **SILVER** channel for the first level of interagency law enforcement communications in both basic and extended incidents. In an incident command system, the **GOLD** channel is used at the highest operational level. In many cases it would be used by the incident commander (IC) to direct the various types of resources (fire, EMS, law enforcement, etc.) that respond.

When an extended law enforcement command net is needed as an incident grows, the **BLUE (VLAW 31)** channel is inserted above **SILVER**, with the latter being retained at the first interagency communications level. For example, the previous plan could be modified as below, focusing on law enforcement and excluding the individual units (Figure 32).

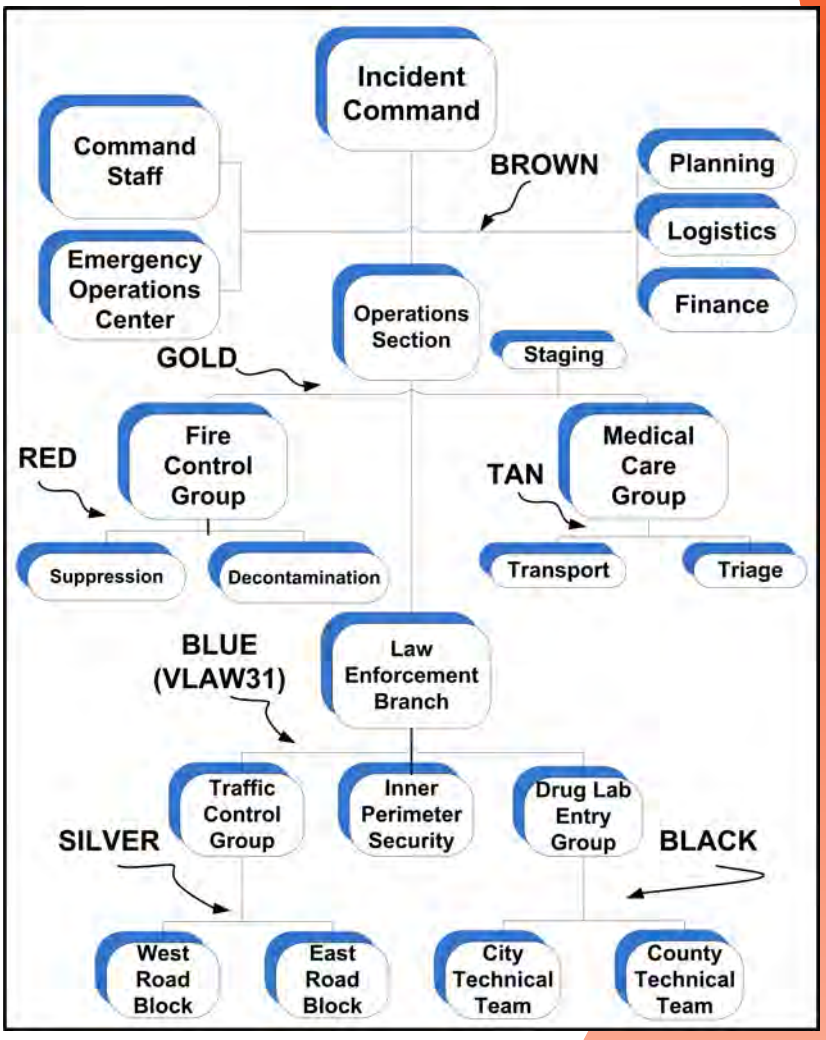
Figure 32: Extended Law Enforcement Command Net



As an incident becomes more complex, operations are likely to be split from other command functions and an operations section chief assigned. The **GOLD** channel would continue to serve as the primary inter-discipline command net, while a new frequency would be assigned for incident command communications between the command staff and each functional section chief. The **BROWN** channel (State DES Direction and Control) would be appropriately used.

A large-scale incident communications plan may appear as depicted in Figure 33, with emphasis on the law enforcement structure.

Figure 33: Large-Scale Incident with Operations Split from Command



Part IV: Fire Services

Introduction

Montana has nearly 400 fire service entities—with more diverse emergency response organizations than law enforcement, EMS, and Search and Rescue (SAR) organizations combined. Most of these fire services have one or more radio frequencies licensed for their use within their own jurisdictions. Many also have access to local coordination radio systems, often using mobile relays (repeaters). Mutual aid and common frequency use can supplement locally licensed systems and provide much needed communications interoperability.

This document establishes policies and procedures for the use of Montana's fire mutual aid radio frequencies, interagency itinerant and emergency communications within Montana. Usage, eligibility, recommended radio zones and incident communications plans are covered in this section.

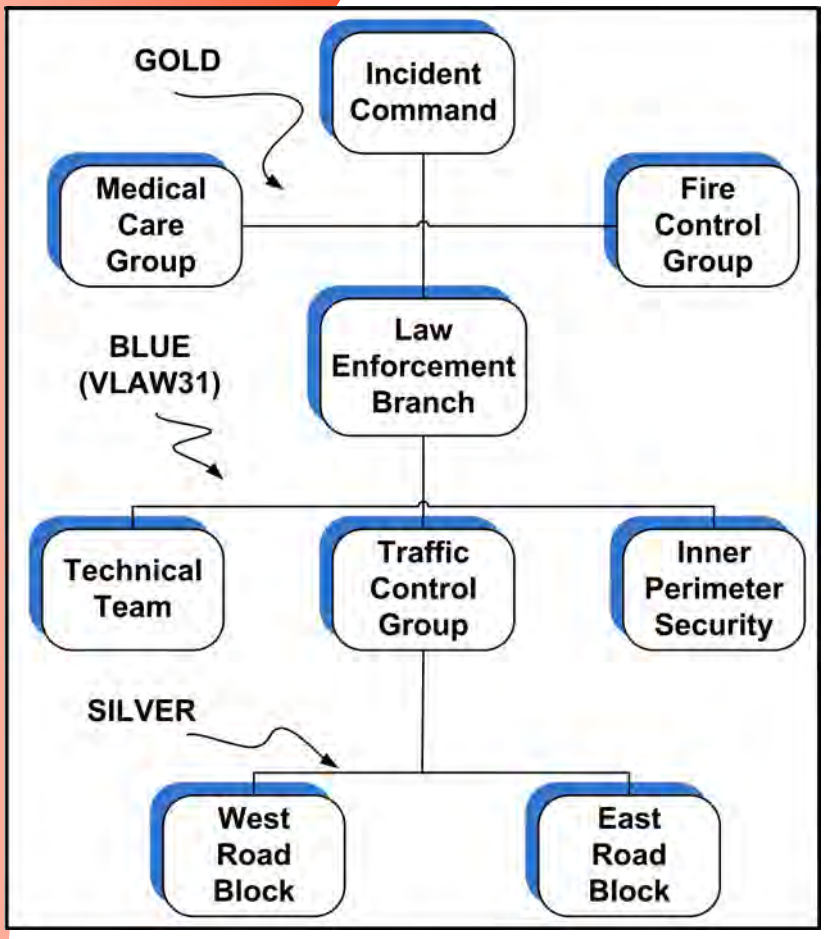
Montana Fire & General Use Mutual Aid Frequencies and Usage

The Montana fire mutual aid frequencies are established exclusively for interagency emergency and itinerant fire services communications. Nine fire service mutual aid frequencies are listed in Table 16, along with three other frequencies: **GOLD, TAN (VMED28)** and **NEON**, which have been established for general public safety use, including fire services. Agencies are now being encouraged to use both the Montana color name for a frequency as well as the National Interoperability Designator **(VFIRE, VLAW & VMED).**

Table 16: Montana Mutual Aid Fire/General Use Frequencies

Frequency (MHz)	Color Name & National Designator	Usage/Restrictions/ Notes
Fire Mutual Aid Frequencies		
153.8300	**RUBY**	**State Fire Repeater (Output)** • The primary use of **RUBY** paired with **GARNET** is for mobile-mobile communications. • Licensed for temporary mobile relay and meant to be paired for mobile relay use with **GARNET**. **RUBY** is the output frequency of the relay (or fixed base for talk-around use) and **GARNET** is the control or input frequency.
159.3450	**GARNET**	**State Fire Repeater Control (Input)** Licensed for control station use. Meant to be paired with **RUBY**
154.0700	**RED**	**State Fire Mutual Aid** • Should be the first choice for on-scene interagency communications. • Not to be used within 75 miles of Bow Island, Alberta per FCC license.
154.2800	**MAROON (VFIRE21)**	**State Command and Control** • Primary use is for base-mobile communications for interagency dispatch and multi-agency command and control. • Commonly used for fire mutual aid by surrounding states. • A shared operational resource between fire organizations and agencies. Hence, overlapping coverage of base stations and interference can be expected. • This channel is to be used for directing diverse resources to large-scale incidents as well as for on-scene command when not tied up with base-base traffic.
154.2650	**CORAL (VFIRE22)**	**State Fire Ground #1** Available for on-scene interagency communications where incident scope requires additional ground channels.

Figure 32: Extended Law Enforcement Command Net



As an incident becomes more complex, operations are likely to be split from other command functions and an operations section chief assigned. The **GOLD** channel would continue to serve as the primary inter-discipline command net, while a new frequency would be assigned for incident command communications between the command staff and each functional section chief. The **BROWN** channel (State DES Direction and Control) would be appropriately used.

A large-scale incident communications plan may appear as depicted in Figure 33, with emphasis on the law enforcement structure.

Figure 33: Large-Scale Incident with Operations Split from Command

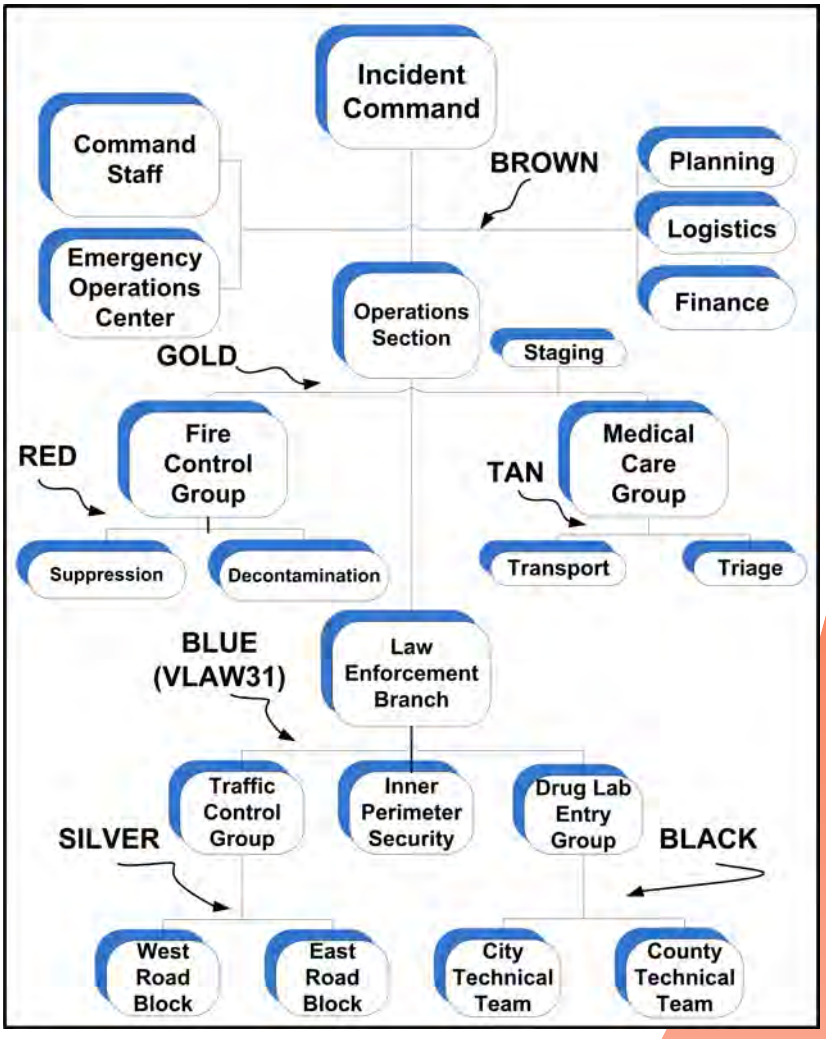


Table 16: Montana Mutual Aid Fire/General Use Frequencies *(continued)*

Frequency (MHz)	Color Name & National Designator	Usage/Restrictions/ Notes
Fire Mutual Aid Frequencies *(continued)*		
154.2950	**SCARLET (VFIRE23)**	**State Fire Ground #2** Available for on-scene interagency communications where incident scope requires additional ground channels.
154.2725	**COPPER (VFIRE24)**	**State Fire Ground #3** • Available for on-scene interagency communications where incident scope requires additional ground channels. • Maximum mobile power is 100 watts ERP. • Secondary status to existing co-channel and 7.5 kHz adjacent channels in Carbon and Gallatin Counties and parts of Meagher County. See Figure 9 on page 21.
154.2875	**BURGUNDY (VFIRE25)**	**State Fire Ground #4** • Available for on-scene interagency communications where incident scope requires additional ground channels. • Secondary to adjacent 7.5 kHz licensed channels where applicable. See Figure 10 on page 22.
154.3025	**CRIMSON (VFIRE26)**	**State Fire Ground #5** • Secondary to adjacent 7.5kHz licensed channels where applicable. See Figure 11 on page 23.
172.2250	**ALPHA**	**Interagency Fire Use Only** • 15-Watt Limit
172.3750	**BRAVO**	**Interagency Fire Use Only** • 15-Watt Limit
General Use Frequencies		
153.9050	**GOLD**	**General Mutual Aid and Coordination** • Available to all Montana public safety and emergency responders. • Designated for inter-discipline communications. • Used for both emergency and administrative (non-emergency) traffic; however, administrative traffic can be preempted by a higher priority need.

Table 16: Montana Mutual Aid Fire/General Use Frequencies *(continued)*

Frequency (MHz)	Color Name & National Designator	Usage/Restrictions/ Notes
General Use Frequencies *(continued)*		
155.3400	**TAN (VMED28)**	**Primary Use**: State Air-to-Ground Coordination • For use by rotary or fixed wing aircraft to communicate with ground response units at emergency scenes. Its use includes landing assistance and emergency coordination. **Secondary Use:** EMS communications and medical staging at an incident scene. • For Hospital-to-Hospital and Hospital-to-Ambulance communications or for EMS interagency communications at an incident scene. **10-Watt Airborne Limit restricted to under 5280 feet AGL altitude.**
157.4250	**NEON**	**Primary Use**: General Mutual Aid and Coordination **Secondary Use:** EMS Priority during mass-casualty incidents. On-scene incident management per SOP. (Triage Group) • 40-Watt Mobile Limit • Not available within 120 km of Coutts, AB, including the following jurisdictions: Blackfeet Reservation and Glacier, Liberty, Pondera and Toole Counties. Also not available in: Daniels, McCone, Richland, Roosevelt and Valley Counties or on the Fort Peck Reservation due to co-channel use. See Figure 3 on page 13.
154.4525	**CHARLIE (VTAC 12)**	**Tactical General Use Interoperability Channel** • Not available above Line A except at the **Plentywood** repeater site in Sheridan County. • Secondary status to existing co-channel and 7.5 kHz adjacent channels in the following counties: Broadwater, Cascade, Jefferson, Lewis and Clark, Mineral, Powell and Ravalli. See Figure 4 on page 15.

Table 16: Montana Mutual Aid Fire/General Use Frequencies *(continued)*

Frequency (MHz)	Color Name & National Designator	Usage/Restrictions/ Notes
General Use Frequencies *(continued)*		
155.7525	**DELTA (VCALL10)**	**Tactical General Use Interoperability Channel** • Not available above Line A or in Missoula County. • Secondary status in the following areas: Flathead Reservation, Granite, Mineral, Powell, Ravalli and Sanders Counties. See Figure 5 on page 16.
158.7375	**ECHO (VTAC13)**	**Tactical General Use Interoperability Channel** • Not available above Line A per FCC license except at these Interoperability Repeater Sites: **Highwood Baldy** (Chouteau County), **Mount Royal** (Liberty County), **SACO** (Phillips County) and **Windy Hill** (Roosevelt County/Fort Peck). Use channels 154.4525 MHz Repeater TX/159.4725 MHz Mobile TX. • Not available in Lake and Missoula Counties. • Secondary status for mutual aid use in the following counties: Granite, Mineral, Powell, Ravalli, Sanders and within 20 km of Maverick Mountain in Beaverhead County. See Figure 6 on page 17.
159.4725	**FOX (VTAC14)**	**Tactical General Use Interoperability Channel** • Not available above Line A per FCC license. • Secondary status within 20 km of Maverick Mountain in Beaverhead County. See Figure 7 on page 17.
151.1375	**GOLF (VTAC11)**	**Tactical General Use Interoperability Channel** • Not available above Line A per FCC license except at these Interoperability Repeater Sites: **Highwood Baldy** (Chouteau County), **Mount Royal** (Liberty County), **SACO** (Phillips County) and **Windy Hill** (Roosevelt County/Fort Peck). Use channels 154.4525 MHz Repeater TX/159.4725 MHz Mobile TX. • Secondary status to existing co-channel and 7.5 kHz adjacent channels in Mineral County and within 20 km of Maverick Mountain in Beaverhead County. See Figure 8 on page 18.

Table 17: Montana Mutual Aid General Purpose Border Interoperability Frequency

Frequency (MHz)	Color Name & National Designator	Usage/Restrictions/ Notes
155.4750	**BLUE (VLAW31)**	**Border Interoperability Channel** • Uses the 155.4750 MHz law enforcement frequency as a common resource for border incidents in Alberta, British Columbia, Montana and Saskatchewan. • For all law enforcement, fire, EMS and public safety agencies including local, state, tribal, federal and Canadian users **within 16 km (10 mi) of the US-Canadian border.**

Eligibility

To be eligible to use mutual aid frequencies, non-federal fire protection organizations or agencies must be eligible to hold an FCC license in the Fire or Local Government service or be authorized to directly support fire suppression activity with a fire department. In addition, public safety agencies are eligible for authorization by applying for a mutual aid permit for any fire mutual aid frequency for multi-disciplinary operations.

Fire organizations or agency licensees are bound by law to all applicable FCC rules and regulations. Those seeking to use Montana fire mutual aid frequencies must meet FCC eligibility requirements, as listed below:

> FCC §90.20 (a) - Eligibility. Any territory, possession, state, city, county, town or similar governmental entity is eligible to hold authorizations in the Public Safety Pool to operate radio stations for transmission of communications essential to official activities of the licensee, including. . . persons or organizations charged with specific fire protection activities.

Oversight & Discipline

The policies and procedures established here, combined with the FCC Rules and Regulations: Part 90, comprise the usage guidelines for the Montana fire mutual aid radio frequencies. Failure to abide by these policies and procedures could result in the removal of authority to operate on any mutual aid frequency.

DOJ in consultation with public safety agencies shall be vested with authority to deal with complaints of abuse brought before it.

Licensing and Authorization

Authority for use of Montana fire mutual aid frequencies is obtained through licensing with the FCC and by applying for a mutual aid permit with DOJ. DOJ can provide mobile use authorizations to fire service entities already licensed in the Fire or Local Government FCC services. It also can provide authorization to establish temporary base, mobile relay and control stations for special incidents. FCC regulations require that any station intended to be operated for a year or more be permanently licensed at the specific site. The **CORAL (VFIRE22), SCARLET (VFIRE23), COPPER (VFIRE24), BURGANDY (VFIRE25),** and **CRIMSON (VFIRE26)** frequencies *cannot* be so licensed.

The entities and eligible uses for fire mutual aid frequencies within Montana are provided in Table 18. Operational licensing requirements are outlined so that Montana fire mutual aid frequencies may be used effectively. Additional rules and regulations affecting eligibility may be established by DOJ in consultation with state, local, tribal or federal public safety agencies.

Table 18: Eligible Entities and Licensing of Fire/General Use Mutual Aid Frequencies

Channel Name	Eligibility	DOJ	Fire Service[3]
RUBY (Output)	**Bases**	Licensed statewide for temporary fixed base use and permanent mutual aid repeaters	• Permanent base station use must have an FCC license authorizing such installation before commencing operations. • Paired with **GARNET** for mobile relay use. (**GARNET** must be the input or mobile transmit frequency.)
	Mobile	Licensed statewide for mobile and mobile relay use.	• Available for installation in mobiles by permit. • Permanent mobile relays may be licensed directly with the FCC.
GARNET (Input)	**Bases**	Licensed statewide for temporary control station use.	• Available for installation in temporary control stations by permit. • Permanent base or control station licensing by individual fire service entities is expressly prohibited.
	Mobile	Licensed statewide for mobile use.	Available for installation in mobiles by permit.

[3] Must be a licensee in the Fire or Local Government FCC service to be eligible to use these frequencies. In addition, any public safety agency is eligible for authorization by agreement for any fire mutual aid frequency for multi-disciplinary operations.

Table 18: Eligible Entities and Licensing of Fire/General Use Mutual Aid Frequencies *(continued)*

Channel Name	Eligibility	DOJ	Fire Service
RED, CORAL (VFIRE22), and SCARLET (VFIRE23)	**Bases**	Not licensed for base station use.	Base station licensing after Nov. 1, 1989 on these frequencies is expressly prohibited.
	Mobile	Licensed statewide for mobile use.	Available for installation in mobiles by permit. Mobile licensing by individual entities has not been allowed since Nov. 1, 1989.
MAROON (VFIRE21)	**Bases**	Licensed statewide for temporary fixed base use.	• Permanent base station use must have an FCC license authorizing such installation before commencing operations. • Operations must be primarily base-mobile communications.
	Mobile	Licensed statewide for mobile use.	Available for installation in mobiles by permit.
COPPER (VFIRE24), BURGANDY (VFIRE25), CRIMSON (VFIRE26), and NEON	**Bases**	Not licensed for base station use.	Not available for base station use.
	Mobile	Licensed statewide for mobile use.	Available for installation in mobiles by permit.

Three usage classes are charted in Table 19 below with their permissibility—all communications are considered two-way.

Table 19: Permissible Uses of Fire/General Use Mutual Aid Frequencies

Channel Name	Frequency (MHz)	Base - Mobile	Base - Base	Mobile - Mobile	Type of Use
RUBY	153.8300	YES	NO	YES	Command
GARNET	159.3450	YES	NO	YES	Control
RED	154.0700	NO	NO	YES	Tactical
CORAL (VFIRE22)	154.2650	NO	NO	YES	Tactical
SCARLET (VFIRE23)	154.2950	NO	NO	YES	Tactical
MAROON (VFIRE21)	154.2800	YES (secondary)	YES (secondary)	YES (secondary)	Command
COPPER (VFIRE24)	154.2725	NO	NO	YES	Tactical
BURGANDY (VFIRE25)	154.2875	NO	NO	YES	Tactical
CRIMSON (VFIRE26)	154.3025	NO	NO	YES	Tactical
NEON	157.4250	NO	NO	YES	Tactical

Frequency Monitoring

Nothing in this section should be construed as prohibiting the installation of any frequency for receive-only operations (monitoring). Users of any mutual aid frequency are required to monitor the frequency prior to transmitting to detect higher priority traffic. When need be, an "EMERGENCY TRAFFIC" interruption or "EMERGENCY TRAFFIC ONLY" broadcast can be made.

All users of the fire mutual aid frequencies must render service to itinerant vehicles on the frequencies when such traffic relates to enhanced public safety.

Agencies with **MAROON (VFIRE21)** base stations installed should monitor the frequency at all times when their facility is operational. A separate receiver for this frequency is encouraged to prevent other traffic or transmissions from covering it. Mobile monitoring of the channel at all times by all users is encouraged as well.

Recommended Radio Zones

The following examples are based on the fact that most radios utilize zones of 16 channels. Channels 1-7 reflect frequencies utilized for Command & Control. Channels 8-12 display tactical use frequencies. Channels 13-15 are allocated for local use frequencies. Channel 16 has been set aside for **MAROON (VFIRE21).** The purpose of these common radio zone banks is to serve as a guideline for interoperable channel utilization and to avoid programming problems associated with the frequency proximity of some mutual aid frequencies.

Note: Fire agencies that operate on Montana's statewide trunking system will have different requirements for Zone 3(C). These agencies should follow the requirements set forth by the Montana Highway Patrol. That recommended tactical zone may be placed in Zone 4 in those radios.

Table 20: Fire Service Zone C(3) General Recommendation

Mode		Mutual Aid	Frequency (MHz)
1	Command & Control	GOLD	153.9050
2		NEON	157.4250
3		RED	154.0700
4		CRIMSON (VFIRE26)	154.3025
5		COPPER (VFIRE24)	154.2725
6		SCARLET (VFIRE23)	154.2950
7		CORAL (VFIRE22)	154.2650
8	Tactical	BURGANDY (VFIRE25)	154.2875
9		RUBY/GARNET RPT	153.8300/159.3450
10		TAN (VMED28) A/G	155.3400
11		ALPHA	172.2250
12		BRAVO	172.3750
13	Local	Local Option	
14		Local Option	
15		Local Option	
16	CC	MAROON (VFIRE21)	154.2800

Table 21: Fire Service Tactical Zone 1 Recommendation

Mode		Mutual Aid	Frequency (MHz)
1	Command & Control	GOLD	153.9050
2		NEON	157.4250
3		TAN (VMED28) A/G	155.3400
4		CRIMSON (VFIRE26)	154.3025
5		RED	154.0700
6		VCALL 10 - DELTA	155.7525
7		BROWN	155.8200
8	Tactical	CORAL (VFIRE22)	154.2650
9		BURGANDY (VFIRE25)	154.2875
10		ALPHA	172.2250
11		GOLF (VTAC11)	151.1375
12		RUBY/GARNET RPT	153.8300/159.3450
13	Local	Local Option	
14		Local Option	
15		Local Option	
16	CC	MAROON (VFIRE21)	154.2800

Table 22: Fire Service Tactical Zone 2 Recommendation

Mode		Mutual Aid	Frequency (MHz)
1	Command & Control	GOLD	153.9050
2		NEON	157.4250
3		TAN (VMED28) A/G	155.3400
4		CRIMSON (VFIRE26)	154.3025
5		RED	154.0700
6		DELTA (VCALL 10)	155.7525
7		BROWN	155.8200
8	Tactical	COPPER (VFIRE24)	154.2725
9		SCARLET (VFIRE23)	154.2950
10		BRAVO	172.3750
11		CHARLIE (VTAC12)	154.4725
12		RUBY/GARNET RPT	153.8300/159.3450
13	Local	Local Option	
14		Local Option	
15		Local Option	
16	CC	MAROON (VFIRE21)	154.2800

Table 23: Fire Service Tactical Zone 3 Recommendation

Mode		Mutual Aid	Frequency (MHz)
1	Command & Control	GOLD	153.9050
2		NEON	157.4250
3		TAN (VMED28) A/G	155.3400
4		CRIMSON (VFIRE26)	154.3025
5		RED	154.0700
6		DELTA (VCALL 10)	155.7525
7		BROWN	155.8200
8	Tactical	CRIMSON (VFIRE26) [4]	154.3025
9		ECHO (VTAC13)	158.7375
10		FOX (VTAC14)	159.4725
11		DOJ TAC 1 [5]	153.7550
12		RUBY/GARNET RPT	153.8300/159.3450
13	Local	Local Option	
14		Local Option	
15		Local Option	
16	CC	MAROON (VFIRE21)	154.2800

[4] Due to limited frequency resources, **CRIMSON (VFIRE26)** is repeated in this configuration; it is first used as a Command & Control frequency and later as a Tactical channel.

[5] Permission to use this frequency must be obtained from DOJ.

Incident Communications Plans

At the simplest incident, command/control communications are indistinguishable from tactical communications. The incident commander in such a case is directing resources (command/control) right down to the smallest working (tactical) level. Mutual aid radio is rarely needed in such minor incidents since one working frequency is generally adequate.

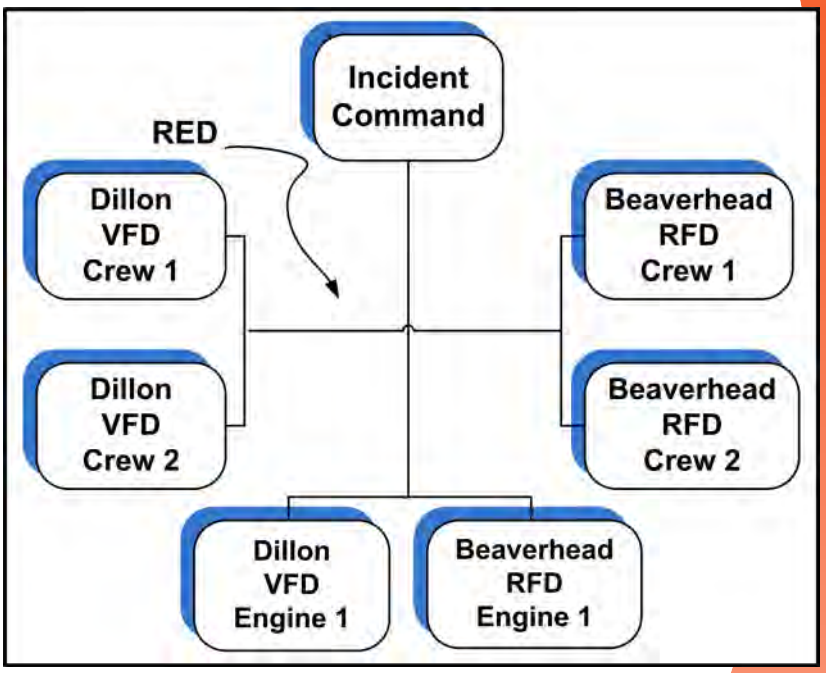
A distinction between tactical and command/control communications needs to be made as an incident grows and when communications traffic becomes too great for a single frequency. More than one radio frequency is needed to establish separate networks (nets) unless a medium other than radio is used for one or the other.

Any public-safety entity—fire service or otherwise—should have an adequate number of frequencies available to conduct operations not requiring interagency response. In other words, if a given fire organization needs multiple, separate nets for internal command, control and tactical communications, it should have enough frequencies available to satisfy its own needs. Mutual aid radio cannot provide all the frequency resources for public safety response; it is intended for interagency communications.

1. Basic Interagency Operations

The most basic communications plan for an interagency fire incident would use the **RED** channel for interagency traffic. Each organization would use its own channel for internal communications. Each organization would use its own channel for internal communications. This communications plan is depicted in Figure 34. Although not shown in Figure 34, the **GOLD** channel may be appropriately used for check-in directly with the incident commander.

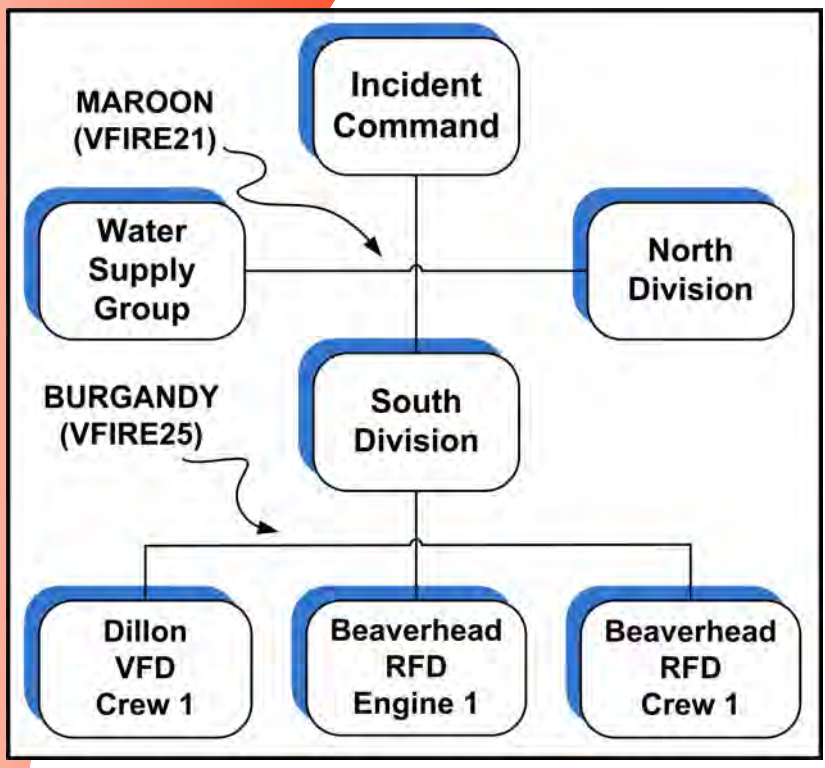
Figure 34: Basic Interagency Fire Incident Communications Plan



A slightly more complex plan is needed when interagency command must be separated from interagency tactical communications. Figure 35 on the following page shows a plan with a command net on **MAROON (VFIRE21)** between the incident command, a functional element (group) and geographic elements (divisions).

The **MAROON (VFIRE21)** channel is available for base station installation and is currently used by some interagency communications centers. It would appropriately be used in this scenario between the incident command and communications center for ordering resources in the initial stages of a response.

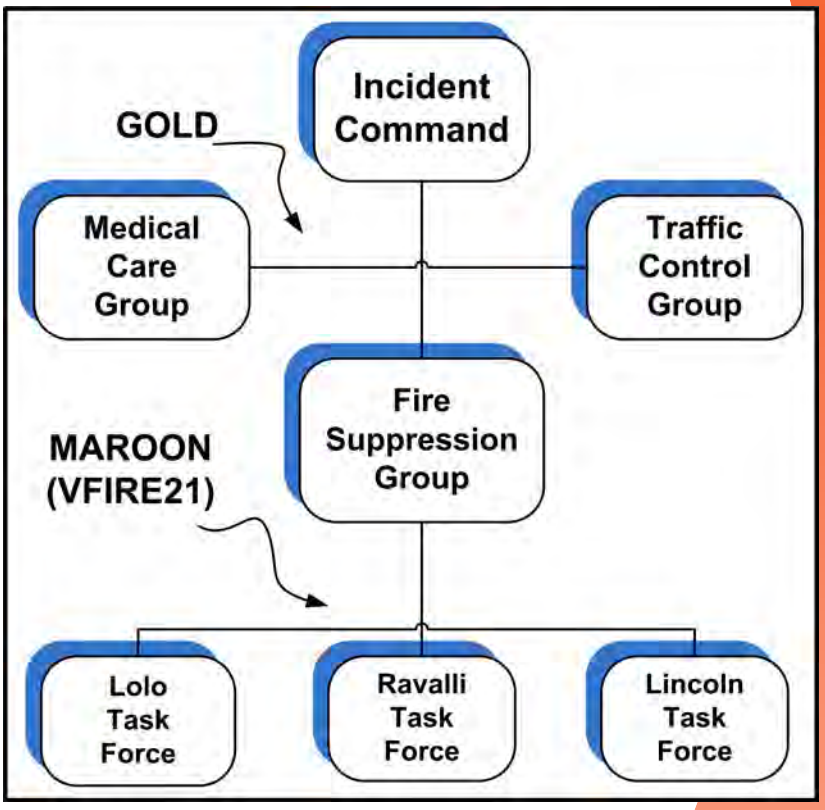
Figure 35: Interagency Command Separated from Tactical Communications



The example in Figure 35 is simplified by identifying individual resources provided by separate fire service agencies. The plans assume that additional organizational subdivisions may take place within the agencies, and their own frequencies will be useable for communications. Often times, though, strike teams are formed from different agencies and the "private" frequencies of each agency are useless within the group. Mutual aid frequencies are appropriate for this use.

Considering an incident involving only fire responders, a simple two-level command structure (with the IC managing operations) and a strike-team approach, a communications plan may look like the example shown in Figure 36, with the **RED**, **CORAL (VFIRE22)**, and **SCARLET (VFIRE23)** frequencies assigned for equivalent functions.

Figure 36: Simple Two-Level Command Structure



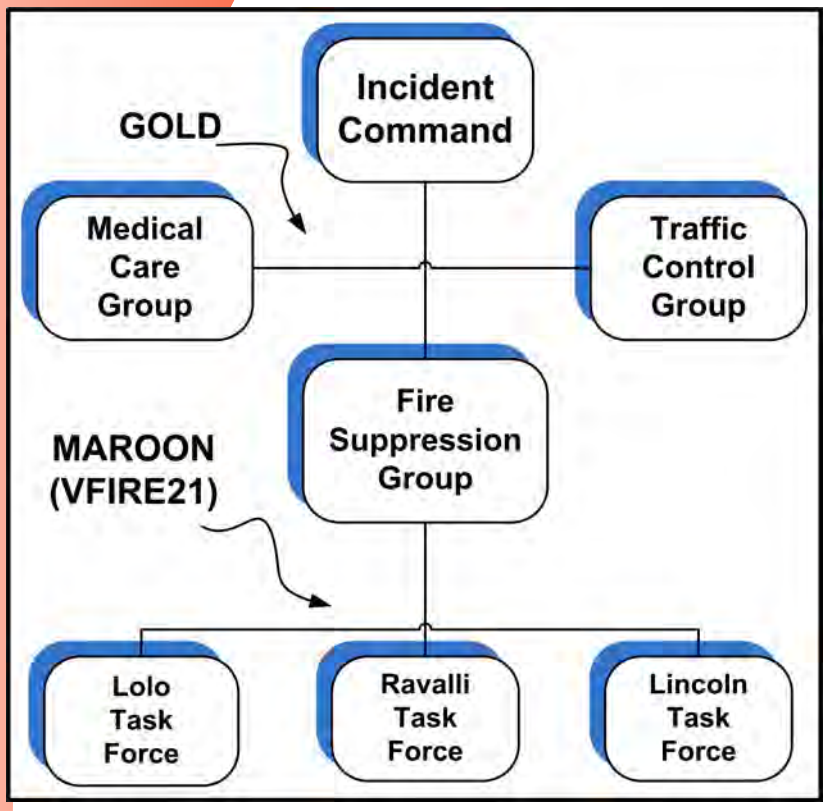
2. Extended Incidents

Fire incidents have a high potential for becoming inter-disciplinary in nature, involving EMS and law enforcement among others. Extended incidents as discussed here are those which involve other types of public safety services. They require additional planning for communications. The **GOLD** channel is the primary means of radio communication between different public safety service types.

The simplest inter-discipline incident may be one where the incident commander is directly responsible for fire operations as well as for coordinating EMS response. The IC would appropriately use the **GOLD** channel for communications with all tactical units.

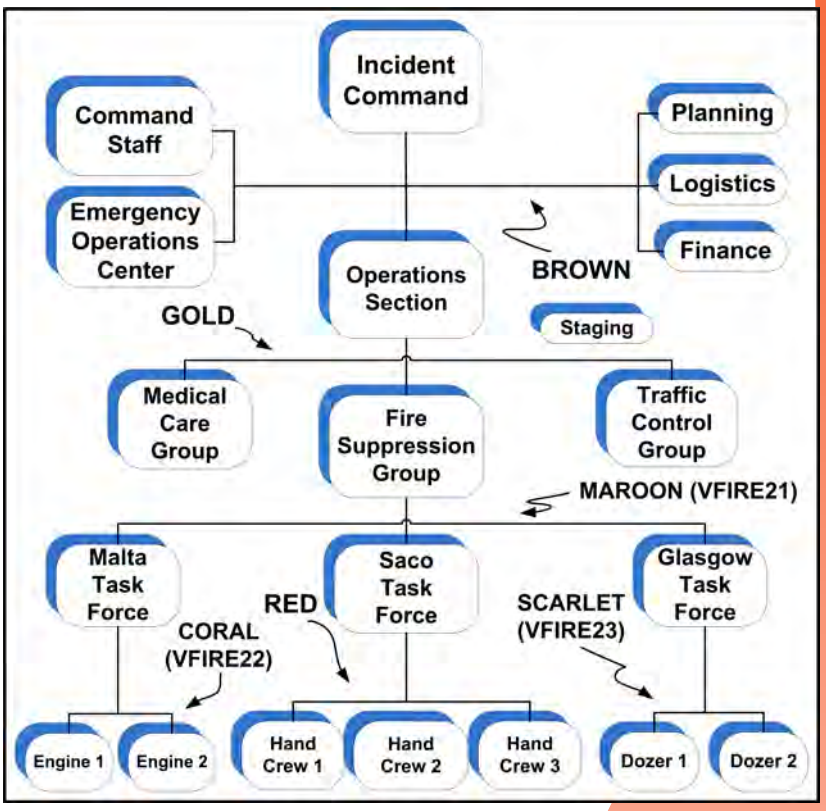
As the situation becomes more complex, the incident commander is less responsible for fire interagency coordination and more responsible for inter-discipline coordination. A separate fire branch may be established, and the communications plan extended smoothly, as illustrated in Figure 37.

Figure 37: Extended Communications Plan with Separate Fire Branch



When direct operations responsibility is moved away from the incident commander and an operations section chief is instituted because of the incident complexity and scope, the communications plan can expand to include the use of the State DES Direction and Control (**BROWN**) channel. The most complex plan included here may appear as depicted in Figure 38.

Figure 38: Expanded Communications Plan with use of BROWN Channel



3. Geographically Extended Incidents

Geographically extended incidents are supported by mutual aid communications with the use of two frequencies for interagency fire repeaters. **RUBY** and **GARNET** are mutual aid channels that are available statewide for shared repeater use. With strategic placement of mutual aid repeaters, mobile and portable radio coverage may be extended over greater distances.

Repeaters not only offer greater mobile coverage, they also add complexities to communications plans and actual operations. Two frequencies are used per repeater channel and confusion may arise over which is the mobile transmit and which is the repeater transmit. Because they are usually sited high on mountains to provide the best coverage possible, repeaters also can cause interference at greater distances.

RUBY repeaters are suitable for command or tactical communications, interagency and even inter-discipline. Users are strongly encouraged to study the restrictions on **RUBY** and **GARNET** explained earlier in this manual and to further consult with their radio service providers before incorporating these frequencies into their plans. Permanent repeaters must be licensed with the FCC by the user. Authorization to use **GARNET**, the repeater control frequency, is only available through permit with DOJ.

COPPER (VFIRE24), **BURGANDY (VFIRE25)** or **CRIMSON (VFIRE26)** may be used to expand operations in the example illustrated in Figure 38 to manage task force and crew communications.

Part V: Emergency Medical Services (EMS)

Introduction & Purpose

The purpose of this Emergency Medical Services (EMS) Frequencies Plan is to establish both a guide for EMS providers and an overview of requirements for local EMS systems to ensure that a statewide communications system is in place to address daily needs as well as large-scale, multi-casualty situations.

This plan establishes statewide EMS mutual aid frequencies for medical and interagency itinerant and emergency communications within Montana via authority of Montana Codes Annotated §2-17-312 and in accordance with FCC Rules and Regulations, Part 90.

This section of the *Mutual Aid and Common Frequencies Manual* is intended to:

1. Ensure coordination with dispatch of EMS agencies.
2. Provide for Hospital-to-Ambulance[6] and Ambulance-to-Ambulance radio communications.
3. Provide communications among all EMS providers.
4. Provide for communications between medical response services and all other emergency response agencies.
5. Allow for coordinated mutual aid communications between medical units and other response agencies in the event of a major EMS incident.
6. Be coordinated statewide to ensure good communications with a minimum duplication of effort.

[6] The Hospital-to-Ambulance word sequence is used for the sake of simplicity. But, it is meant to imply two-way communications, i.e. Ambulance-to-Hospital communications as well.

Frequency Authorization

EMS frequencies may be permitted for base, base-mobile, or mobile-only use by agencies or organizations qualifying as special emergency entities under FCC §90.35. All licensed emergency medical service providers in Montana qualify, but must hold a valid permit to use any mutual aid frequencies.

Mobile access by agreement to EMS frequencies is provided through a joint arrangement between DOJ and the Department of Public Health and Human Services (DPPHS), EMS & Trauma Systems (EMSTS) Section. The EMSTS Section, through DOJ, maintains a statewide mobile-only license for frequencies and can authorize mobile use to qualified entities unable to obtain a license themselves. The EMSTS Section also oversees the EMS Communications Plan.

Part IX, "Frequency Coordination," of this manual contains additional information on frequency use authorization as well as contact information for appropriate agencies. Table 24 provides the contact information for DOJ and EMSTS frequency inquiries.

Table 24: DOJ & DPHHS Contact Information

Department of Justice (DOJ)	Dept. of Public Health and Human Services (DPHHS)
Public Safety Communications Bureau (PSCB)	EMS & Trauma Systems Section (EMSTS)
215 N. Sanders St.	1400 Broadway Cogswell Building - Room C317
Helena, MT 59620	Helena, MT 59620
Phone: 406-444-2491	Phone: 406-444-3895
frequency@mt.gov	**emsinfo@mt.gov**

Eligibility

All Montana EMS providers licensed[7] by DPHHS are eligible to hold a mutual aid permit for the Special Emergency Radio Service frequencies 155.2800 (**WHITE**), 155.3400 (**TAN**), 155.3250 (**GRAY**) and 155.3850 (**PINK**) for the uses approved here. Further rules and regulations affecting eligibility may be established by DOJ in consultation with DPHHS.

Frequency Usage

The Montana EMS and certain general use frequencies are established for EMS interagency emergency and itinerant communications. Table 25 contains a list of Montana's EMS and general use frequencies and their primary and secondary uses:

Table 25: MT Mutual Aid EMS and General Use Frequencies

Frequency (MHz)	Color Name & National Designator	Usage/Restrictions/ Notes
EMS Mutual Aid Frequencies		
155.2800	**WHITE**	**Hospital-to-Ambulance and Hospital -to-Hospital Communications** • **WHITE** may be used by licensed EMS services for communication with local, area or regional hospitals. • Paging is not allowed on this frequency. • Digital and encrypted are allowed if documented in the local communications plan. The ambulance must first contact the hospital unencrypted and move to the encrypted mode as appropriate. Radios should be monitored in the unencrypted mode.

[7] Must be a licensed EMS Service.

Table 25: Montana Mutual Aid EMS and General Use Frequencies *(continued)*

Frequency (MHz)	Color Name & National Designator	Usage/Restrictions/ Notes
EMS Mutual Aid Frequencies		
155.3400	**TAN (VMED28)**	**Primary Use**: **Statewide Air-to-Ground Coordination by EMS and other emergency responders.** • Reserved for rotary wing (helicopter) or fixed wing (airplane) aircraft with ground response units at emergency scenes. • Uses include landing assistance and emergency coordination. **Secondary Use: Hospital-to-Ambulance or EMS interagency communications at incident scenes.** • May be used for EMS interagency communications and medical staging of air and ground units at an incident scene. • Authorized for ground ambulance services and non-transporting medical units for mutual aid communications between units at a major incident. **All airborne use is restricted to under 5280 feet AGL altitude and 10-watt ERP**
155.3250	**GRAY**	**Primary Use**: **Central Region Dispatch & Paging** • Used in the central region (2A & 2B) for EMS paging and dispatch for communication between an ambulance service or other EMS responding agency and dispatch. • In Montana, the FCC has issued a waiver allowing alerting of EMS personnel on this frequency. **ONLY** EMS personnel may be alerted on this frequency. **Secondary Use: For communications within the *Treatment Group* of the Medical Branch at a major incident per SOP.** **May not be used within 75 mi of Fort MacLeod, Alberta**

Table 25: Montana Mutual Aid EMS and General Use Frequencies *(continued)*

Frequency (MHz)	Color Name & National Designator	Usage/Restrictions/ Notes
EMS Mutual Aid Frequencies		
155.3850	**PINK**	**Primary Use**: **Western/Eastern Region Dispatch & Paging** • Used in the western and eastern region (1A, 1B, 3A, & 3B) for EMS paging and dispatch for communication between an ambulance service or other EMS responding agency and dispatch. • In Montana, the FCC has issued a waiver allowing alerting of EMS personnel on this frequency. **ONLY** EMS personnel may be alerted on this frequency. **Secondary Use: For communications within the *Transport Group* of the Medical Branch at a major incident per SOP.**
General Use Frequencies		
153.9050	**GOLD**	**Primary Use: General Mutual Aid and Coordination** • Available for mobile use (including portable) to any agency, organization, or individual with a legitimate public safety responsibility, including law enforcement, fire, ambulances, Search and Rescue (SAR) organizations and school buses. • Also available for low-powered base station licensure directly with the FCC for those eligible in the Local Government Radio Service (FCC §90.19a). **Secondary Use: For communications between an incident commander and the medical branch leader at a major incident.**

Table 25: Montana Mutual Aid EMS and General Use Frequencies *(continued)*

Frequency (MHz)	Color Name & National Designator	Usage/Restrictions/ Notes
General Use Frequencies		
157.4250	**NEON**	**Primary Use**: **General Mutual Aid and Coordination** **Secondary Use: EMS priority during mass-casualty incidents. During a major incident, this frequency is for communications within *the Triage Group* of a Medical Branch per SOP.** **Restrictions:** • 40-Watt Mobile Limit • Not available within 120 km of Coutts, AB, including the following jurisdictions: Blackfeet Reservation and Glacier, Liberty, Pondera and Toole Counties. • Not available in: Daniels, McCone, Richland, Roosevelt and Valley Counties or on the Fort Peck Reservation. See Figure 3 on page 14.

EMS Radio Programming Requirements

Administrative Rules of Montana require that ground ambulances have a VHF *mobile* radio programmed with EMS frequencies and the State Common Mutual Aid **GOLD** (153.9050 MHz) channel.

Air ambulances must have a VHF *portable* radio programmed with both the Hospital-to-Ambulance **WHITE** (155.2800 MHz) frequency and the Air-to-Ground **TAN-VMED28** (155.3400) frequency.

Non-transporting units must have the capability of providing at least one radio at every emergency medical scene programmed with a minimum of the following frequencies:

- **Frequency 155.2800 MHz (WHITE)**
- **Frequency 155.3400 MHz (TAN)**
- **Frequency 153.9050 MHz (GOLD)**

Encryption: The **WHITE** channel may be encrypted for sensitive ambulance-to-hospital communications. Radio users should switch to encryption only when communicating confidential patient information or other information that needs to be secure. **WHITE** should never be monitored while operating in an encrypted mode.

Border Interoperability Channel

EMS entities that are adjacent to or have the potential to provide service within 16 km (10 mi) of the US-Canadian border will want to apply for a mutual aid permit to use the Border Interoperability Channel. Use is not authorized until an approved mutual aid permit is issued.

This general purpose mutual aid interoperability channel is for cross-agency use with Canadian responders, and may be used by local, state, tribal, federal and Canadian law enforcement, EMS, fire and other responders for emergency, interagency use only.

Table 26: Montana Mutual Aid General Purpose Border Interoperability Frequency

Frequency (MHz)	Color Name & National Designator	Usage/Restrictions/ Notes
155.4750	**BLUE (VLAW31)**	**Border Interoperability Channel** • Uses the 155.4750 MHz law enforcement frequency as a common resource for border incidents in Alberta, British Columbia, Montana and Saskatchewan. • For all law enforcement, fire, EMS and public safety agencies including local, state, tribal, federal and Canadian users **within 16 km (10 mi) of the US-Canadian border.**

Oversight & Discipline

The policies and procedures established here, combined with FCC Rules and Regulations: Part 90, comprise the usage guidelines for Montana's EMS mutual aid radio frequencies. Failure to abide by these policies and procedures could result in the removal of authority to operate on any mutual aid frequency.

DOJ in consultation with state, local, tribal or federal public safety agencies is vested with authority to deal with complaints of abuse brought before it.

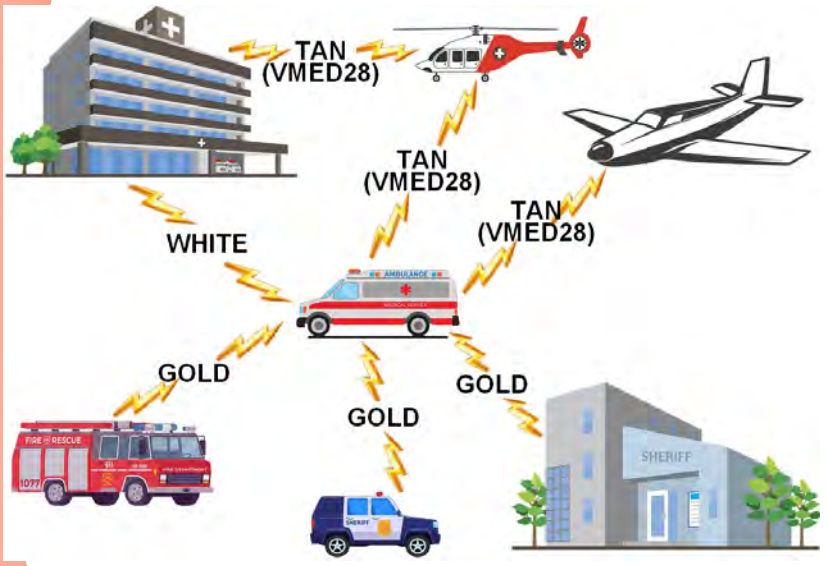
Incident Communications Plans

EMS providers rely heavily on interagency communications. Field responders communicate by radio with public safety officials at incident scenes, with various dispatch centers and with hospitals.

The EMS Communications Plan presented in Figure 39 below has developed over time to address needs of EMS providers to communicate among themselves, hospitals and dispatch. Through the use of other mutual aid and common frequencies, inter-discipline (EMS-to-Fire; EMS-to-Law Enforcement, etc.) communications can be equally well covered.

The remainder of this section covers basic interagency operations and two general incident communications plans from an EMS perspective.

Figure 39: EMS Communications Plan



1. Basic Interagency Operations

EMS personnel typically work closely with their local public safety authorities and often have direct communications capabilities through use of local systems (repeaters, dispatch centers, etc.) When outside resources are needed, or EMS providers travel outside their own area, communications can be a problem unless mutual aid and common frequencies are used effectively. Their use also can reduce the number of frequencies needed to contact the variety of responders with whom EMS needs to communicate.

Three channels are useful for basic interagency operations:

1. The **GOLD** channel (State Common Mutual Aid) is the primary public safety interagency channel in Montana. It is available to any agency, organization, or individual with a legitimate public safety responsibility.

2. The **WHITE** channel is for Ambulance-to-Hospital and Ambulance-to-Ambulance communications and retains that use from routine emergencies to large incidents. Only licensed EMS services may be authorized for a mutual aid permit to use this channel.

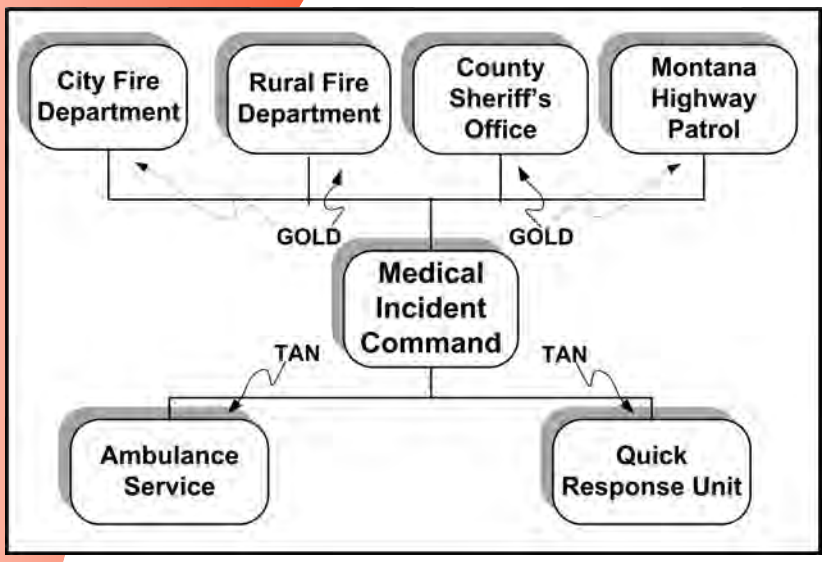
3. The **TAN (VMED28)** channel is designated for Statewide Air-to-Ground Coordination reserved for rotary or fixed wing aircraft with ground response units at emergency scenes. Uses include landing assistance and emergency coordination. Secondary use of the **TAN (VMED28)** channel is for EMS interagency communications (Ambulance-to-Ambulance, Quick Response Unit [QRU], etc.) during larger incidents.

2. Small-Scale Incidents

Figure 40 on the following page shows a communications plan that could be used during a small-scale incident organized under ICS. The Incident Commander could use **GOLD** to manage multi-discipline resources. While the **GOLD** channel may be used between EMS units, care should be taken not to overload **GOLD** since it receives heavy use by various public safety services. Typically, medical commands use **GOLD** for staging and a local channel for tactical purposes. The **TAN (VMED28)** channel provides a link between all emergency medical responders.

The vast majority of Montana interagency incidents could be handled with the simple communications plan shown in Figure 40.

Figure 40: Small-Scale EMS Incident Communications Plan



3. Extended Incidents

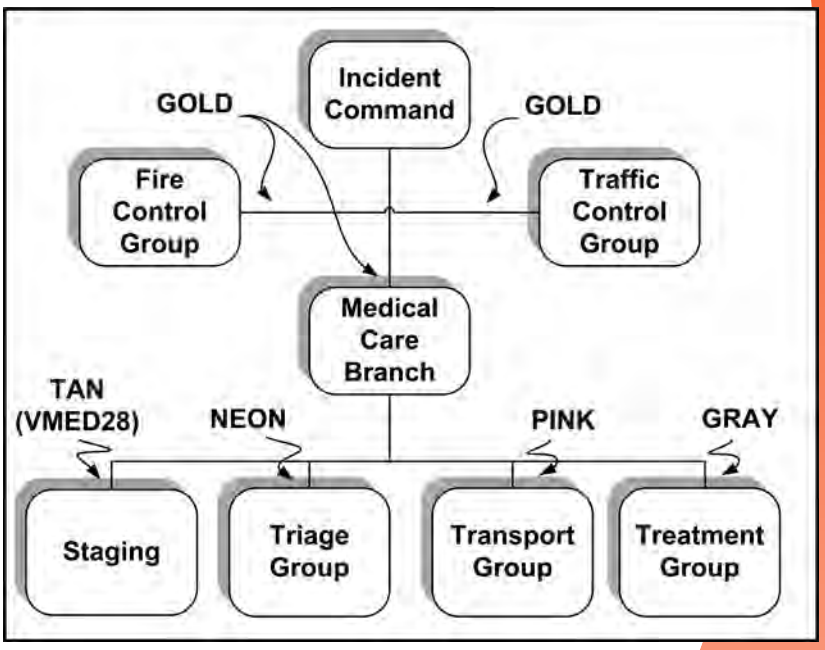
Mass-casualty incidents bring tremendous demands for communications interoperability. EMS, fire and law enforcement resources are usually called upon when they occur, and each response group brings its own unique communications needs. The plan depicted in Figure 41 focuses on the EMS side of such operations, with command span-of-control and organizational structure abbreviated for the sake of clarity. Additional subdivisions may be assumed to exist below unexpanded sections, branches, divisions, groups and task forces.

The **GOLD** channel is the primary means of radio communication between different public safety service types. In this example, it is used by the Medical Incident Commander to direct various types of resources (fire, EMS, law enforcement, etc.) that respond.

EMS units under an ICS communications plan would use **TAN (VMED28)** for medical staging of air and ground units. **NEON** becomes an EMS Priority during a mass-casualty incident. In this instance, **NEON** is used for communications within the Triage Group of a Medical Branch.

GRAY is used for communications within the Treatment Group of the Medical Branch while the **PINK** channel is used for communications within the Transport Group of the Medical Branch.

Figure 41: Mass-Casualty Incident from an EMS Perspective



Part VI: Common and Cooperative Frequencies

Introduction

Common frequencies are distinguished from mutual aid frequencies by the fact that mutual aid frequencies are licensed statewide by the State of Montana which then provides access to public safety agencies by agreement or permit. The term “common” refers to frequencies designated for interagency communications, but not licensed statewide as a mutual aid frequency. They must be licensed by the user agency, and they may be used under agreement with that licensed agency for the purpose of communicating with them.

Cooperative frequency agreements specify the radio frequencies available for shared use along with guidelines or restrictions for their use. Such agreements, or Memoranda of Understanding (MOU), document the cooperation between parties for sharing specific radio frequencies that are authorized to each party. An MOU for cooperative use of frequencies provides efficient, cost effective radio communications to facilitate the exchange of personal services and equipment required to respond to emergencies affecting public safety and to help protect life and property.

Two common/cooperative frequencies identified in this manual are presented in Table 27 followed by a description of each one.

Table 27: Montana Mutual Aid Common and Cooperative Frequencies

Frequency (MHz)	Color Name & National Designator	Usage Restrictions/ Notes
155.8200	BROWN	**State DES Direction and Control** • Exclusively for emergency management communications for direction and control needs during a disaster or emergency situation. • Use only per SOP or State DES approval
171.4750	GREEN	**State/Federal Common** This cooperative frequency may be used only for forest firefighting and conservation activities. It also must be coordinated with the U.S. Dept. of Agriculture.

Disaster and Emergency Services (DES)

State and local Disaster and Emergency Services (DES) offices play a critical role in Montana's emergency response efforts. In times of emergencies, the preservation of life and property depends on a swift and coordinated response of both personnel and resources. The ability to communicate is a key factor in managing response efforts. Montana DES utilizes the **BROWN** (155.8200 MHz) frequency for coordination and control of communications with deployed resources.

DES has acquired state-of-the-art communications technology to enhance its emergency response effectiveness. This technology includes mobile radios, a cache of portable radios, tactical repeaters and interoperable equipment. These assets are intended for statewide use during emergencies, disasters, and/or

incidents for the purpose of supporting local, tribal, state and federal entities. This equipment permits interoperability through VOIP, ROIP, satellite, landlines and cell phones as well as simplex and duplex radio systems that re-transmit signals. In addition, DES maintains a cache of handheld radios in Helena for use on a check-in/check-out basis for any state agency personnel needing portable radio communications while assigned to the State Emergency Coordination Center during an emergency.

DES works with other entities, such as the National Guard, to interface with their communications systems. A reliable, sophisticated communications system is of utmost importance, for not only major disasters, but also for day-to-day public safety needs.

Purpose and Usage

To meet emergency response needs, a statewide common frequency was created for interagency direction and control communications during disaster or emergency situations. It is named the DES Direction and Control Frequency and is referred to as the **BROWN** frequency. It was established in accordance with FCC Rules and Regulations, Part 90 and was designed exclusively for these purposes:

- Emergency management communications by elected or appointed officials of the executive branch of government, emergency response agency department heads and supervisors, and other department heads who have specific emergency assignments.
- Communications which are essential for direction and control needs during a disaster or emergency situation.
- Extended incident coordination between the Incident Commander, command staff, EOC and high-level command/ local government operations.

The **BROWN** channel is available for mobile and/or base licensure directly with the FCC. **Each agency using the frequency must hold a license authorizing use for mobile and base station locations.** Users must either be licensed with the FCC for the common frequency or have an agreement with DES, the license holder, authorizing communications on the frequency.

BROWN should not be used for any of these purposes:

- Fire tactical channel
- Law enforcement tactical channel
- General use frequency
- Agency talk-around frequency

Montana's disaster and emergency management officials can also make good use other General Use mutual aid frequencies in carrying out their responsibilities. The complete list of these frequencies is presented in Table 1 in Part II of this manual.

Eligibility

Specifically, the following entities are eligible to use the DES Direction and Control Frequency within Montana. Additional rules and regulations affecting eligibility may be established by DOJ.

- **State of Montana:** DOJ and the Department of Military Affairs, DES Division, shall be eligible to license the 155.8200 MHz frequency statewide for mobile, temporary fixed base, and temporary fixed mobile relay use for the purposes set forth in this plan. The DES Division shall be eligible to license the frequency for fixed mobile relay use to support operation of the State Emergency Operations Center. The frequency 153.9650 MHz is reserved statewide as the input frequency for these relays and for future expansion of DES communications.

- **Other Government Entities**: Any state agency, county, city, town or similar governmental entity eligible to hold authorization to operate radio stations under FCC Rules and Regulations, Part 90.17 Local Government Radio Service, is eligible to license the frequency 155.8200 for base and/or mobile use.

BROWN is an FCC Local Government frequency coordinated by APCO. Applications for license are submitted through that organization, whose contact information is provided Table 32 of Part IX, Frequency Coordination. Table 28 provides the contact information for DES if a public safety entity wants to request authorization for mobile use of the **BROWN** frequency for communications specifically with DES.

Table 28: DES Contact Information

Montana Disaster and Emergency Services (DES) Division
P.O. Box 4789; 1956 Mt. Majo Street
Helena, MT 59636-4789
Phone: 406-324-4777
FAX: 406-324-4790
mtdes@mt.gov

National Telecommunications and Information Administration (NTIA)

The **GREEN** (171.4750 MHz) channel is allotted to the Department of Agriculture by the National Telecommunications and Information Administration (NTIA). The U.S. Forest Service is an agency within the Department of Agriculture. This cooperative frequency may be assigned "only for forest firefighting and conservation activities in accordance with the provisions of §90.265." It is reserved primarily for assignment to state licensees.

The following restrictions apply for using the **GREEN** channel:

- It has to be coordinated with the U.S. Department of Agriculture (USDA).
- It can only be assigned to licensees directly responsible for the prevention, detection, and suppression of forest fires; or to licensees engaged in forest conservation activities for mobile relay operation.
- After May 27, 2005, channels for new operations are limited to an authorized bandwidth not to exceed 11.25 kHz. If a licensee that uses equipment with an authorized bandwidth greater than 11.25 kHz cannot resolve an interference complaint from an

impacted federal agency, then the licensee must cease operation on the frequency upon notification by the Commission.

- Although this frequency is reserved primarily for state licensees, when coordination of activities with the state system is needed, an assignment can be made to other licensees. Supporting documentation from the state system is required indicating that the frequency is necessary for coordinated operations.
- All applications for use of this frequency must be accompanied by a letter of concurrence by the USDA, which is an MOU for cooperative frequency use. This document can be obtained by contacting the regional frequency manager listed below.

The **GREEN** channel can be used through mutual cooperation to support wildfire communications between Montana DNRC and the U.S. Forest Service where both agencies are involved. Montana response organizations do not have automatic permission to utilize **GREEN** and must follow required processes to obtain that permission. An FCC license is required for State agencies.

Here is the contact information for agencies wanting to submit an access application to license the **GREEN** channel:

Table 29: USFS Contact Information

USDA Forest Service
Mr. Kary Mavencamp*
Regional Frequency Coordinator
1857 Highway 16, Suite A
Emmett, ID 83617
Office: 208-365-7027
Cell: 208-369-0423
Fax: 208-365-7037
kary.mavencamp@usda.gov

* As of July 2021

Department of Natural Resources and Conservation (DNRC)

The Dept. of Natural Resources and Conservation (DNRC) licenses a number of frequencies statewide for mobile communications with wildland fire units, primarily for air-to-ground and tactical operations communications. Use of any of these frequencies by state, tribal or local fire agencies is only authorized by written agreement with DNRC. Utilization outside of agreement is not allowed.

Requests for authorization should be submitted to:

Table 30: DNRC Contact Information

Dept. of Natural Resources and Conservation (DNRC)
Sean Gallagher, Communications Technologist
Dept. of Natural Resources and Conservation
Equipment Development and Communications Section
2705 Spurgin Road
Missoula, MT 59804
Phone: 406-542-4213
FAX: 406- 542-4217
sgallagher@mt.gov

Part VII: Search and Rescue (SAR) Organizations

Introduction & Purpose

Search and Rescue (SAR) organizations provide trained emergency response to find and recover people who are in distress or imminent danger. Under Montana law, sheriffs are responsible for the provision of search and rescue services within their respective counties. Most sheriffs' departments in the state pass along a large share of this responsibility to groups of volunteers. They provide a variety of services, including tracking, water rescue, medical support and evacuation. For more information about Montana SAR organizations, visit this website:

http://www.montanasearchandrescue.org

SAR organizations rely on radio communications a great deal in rendering their life-saving skills. Often they make use of the sheriffs' radio system and some hold their own licenses in the FCC Special Emergency Radio Service.

To meet the needs of SAR organizations, statewide SAR mutual aid frequencies have been established for interagency emergency communications within Montana. The frequencies 155.1600 MHz (**VIOLET - VSAR16***) and 155.2200 MHz (**PURPLE**) are so established by authority of Montana Codes Annotated §2-17-544 and in accordance with FCC Rules and Regulations, Part 90.

* **Note:** SAR common channel 155.1600 MHz **SAR NFM** was renamed **VSAR16** in Version 1.6 of the National Interoperability Field Operations Guide (NIFOG).

Eligibility

According to MCA 7-32-235, SAR units are established or recognized by their county commissioners and are under the control of the county sheriff. SAR units are eligible to use SAR mutual aid frequencies within Montana. Additional rules and regulations affecting eligibility may be established by DOJ in consultation with the General Frequency Oversight Council.

- **Search and Rescue (SAR) Organizations**: Persons or organizations eligible to hold radio station authorization under FCC §90.37, to wit, those operating a rescue squad, are eligible to use Montana SAR common frequencies. Lost-person search units are considered rescue squads for purposes of definition under this plan and interpretation of FCC rules. Licensure on 155.1600 MHz (**VIOLET - VSAR16**) or 155.2200 MHz (**PURPLE**) shall not affect the eligibility of an organization for further Special Emergency Radio Service frequencies under FCC §90.37(b).

    - **Bases**: Any SAR organization in the state meeting the above conditions shall be eligible to obtain base station authorization from the FCC on the frequencies 155.1600 MHz (**VIOLET - VSAR16**) and 155.2200 MHz (**PURPLE**), subject to applicable FCC Rules and Regulations.

    - **Mobile**: Any SAR organization in the state meeting the above conditions shall be eligible to obtain mobile-only authorization from the FCC on the frequencies 155.1600 MHz (**VIOLET - VSAR16**) and 155.2200 (**PURPLE**) or include mobile authorization under a base station license, subject to applicable FCC Rules and Regulations.

Usage

The Montana SAR mutual aid frequencies are established primarily for interagency SAR communications. Intra-agency use is allowed on a secondary basis when it does not interfere with interagency communications. SAR groups are eligible to apply for a mutual aid permit with DOJ for use of the **VIOLET (VSAR16**) and **PURPLE**

channels. In addition, they are eligible to hold permits for four General Use mutual aid frequencies for communications with public safety radio users other than search and rescue, including: **GOLD**, **TAN (VMED28)**, **NEON** and **BLUE (VLAW31)** Border Interoperability Channel. These are listed in Table 27.

Some SAR groups may be eligible for authorization by license or agreement to use EMS, fire, or law enforcement frequencies depending on their particular responsibilities. Generally speaking, though, they are limited by FCC definitions of eligibility for those services.

Table 31: Mutual Aid Search and Rescue and General Use Frequencies

Frequency (MHz)	Color Name & National Designator	Usage/Restrictions/ Notes
Search and Rescue		
155.1600	**VIOLET (VSAR16)***	**National Search and Rescue** SAR Coordination Only
155.2200	**PURPLE**	**State Search and Rescue** SAR Coordination Only
General Use		
153.9050	**GOLD**	**General Mutual Aid and Coordination**
155.3400	**TAN (VMED28)**	**State Air-to-Ground Coordination** ***10-Watt Airborne Limit restricted to under 5280 feet AGL altitude***
157.4250	**NEON**	**General Mutual Aid and Coordination** • 40-Watt Mobile Limit • Not available within 120 km of Coutts, AB, including the following jurisdictions: Blackfeet Reservation and Glacier, Liberty, Pondera and Toole Counties. • Not available in: Daniels, McCone, Richland, Roosevelt and Valley Counties or on the Fort Peck Reservation. See Figure 3 on page 14.

Table 31: Mutual Aid Search and Rescue and General Use Frequencies *(continued)*

Frequency (MHz)	Color Name & National Designator	Usage/Restrictions/ Notes
General Use		
155.4750	**BLUE (VLAW31)**	**Border Interoperability Channel** • Uses the 155.4750 MHz frequency as a common resource for border incidents in Alberta, British Columbia, Montana and Saskatchewan. • For all law enforcement, fire, EMS and public safety agencies including local, state, tribal, federal and Canadian users **within 16 km (10 mi) of the US-Canadian border**.

State Search and Rescue

The frequency 155.2200 MHz (**PURPLE**) is the primary mutual aid channel for communications between SAR groups in Montana. When it doesn't interfere with interagency communications, the **PURPLE** channel may be used by a SAR group for communications between its own responders.

The section on incident communications plans below suggests some appropriate uses of this channel. Paging is strongly discouraged on this channel as well as on ALL mutual aid and common channels.

National Search and Rescue

In the early 1970s, the National Association of Search and Rescue officially promoted the use of 155.1600 MHz (**VIOLET - VSAR16**) as the nationwide SAR frequency. The 2011 U.S. Homeland Security's *National Interoperability Field Operations Guide* points out that this frequency is licensed to many SAR organizations, and it encourages public safety entities to obtain licenses for this frequency to facilitate interoperability.

In Montana, **VIOLET (VSAR16)** may be used for communications between units of a licensee when such use doesn't interfere with interagency communications. Paging is strongly discouraged on this as well as on ALL mutual aid and common channels.

Law Enforcement Frequency Use by Agreement

SAR groups may wish to obtain agreements from law enforcement agencies they work with allowing access to the law enforcement frequencies. FCC rules allow such agreements where a licensee can consider an outside unit as one of its own for communications with it, the licensee. Law enforcement agencies commonly do this to with those with whom they regularly need to work.

Licensing Frequencies

Provisions for SAR organization frequency, base station and radio use are specified under FCC Rule §90.20, "Public Safety Pool". Who is eligible to operate in the Public Safety Pool? Briefly, applicants who were eligible in any of the former Public Safety Radio Services or the former Special Emergency Radio Service are eligible for licensing on channels in the Public Safety Pool.

Non-governmental entities, however, must obtain a letter of consent from the governmental entity having legal jurisdiction over the area to be served if they intend to operate on any channel that was not previously available to the former Special Emergency Radio Service.

Here is the pertinent FCC language:

> §90.20 (a) *Eligibility*. The following are eligible to hold authorizations in the Public Safety Pool. (2) Persons or organizations other than governmental entities are eligible to hold authorizations in the Public Safety Pool to operate radio stations for transmission of communications, as listed below. When requesting frequencies not designated by a "PS[13]" in the coordinator column of the frequency table in paragraph (c)(3) of this section, applications must be accompanied by a

[13] FCC Rule 90.20(c) lists each frequency in the Public Safety Pool and any required frequency coordinator(s) using letter codes: PS stands for Special Emergency Coordinator.

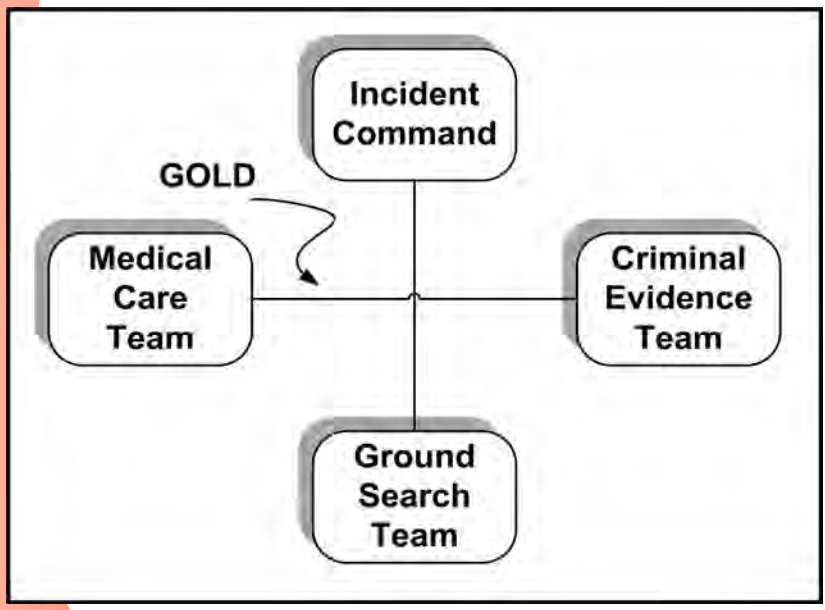
statement from the governmental entity having legal jurisdiction over the area to be served, supporting the request: (iv) Persons or organizations operating a rescue squad for transmission of messages pertaining to the safety of life or property and urgent messages necessary for the rendition of an efficient emergency rescue service.

This section of FCC regulations also restricts SAR organizations to one base station, one mobile for each vehicle actually used in operations, and two portables for each radio-equipped vehicle.

Incident Communications Plans

The SAR incident communications plans presented here are simple and only intended to suggest uses of the **GOLD**, **VIOLET (VSAR16)**, and **PURPLE** channels. The simplest interagency communications plan for a SAR incident would use **GOLD**, as depicted in Figure 42 below. As the State Common Mutual Aid frequency, GOLD is appropriately used at the highest operational level, which includes command in this example, between different public safety disciplines. It would not be appropriately used if only SAR groups were involved.

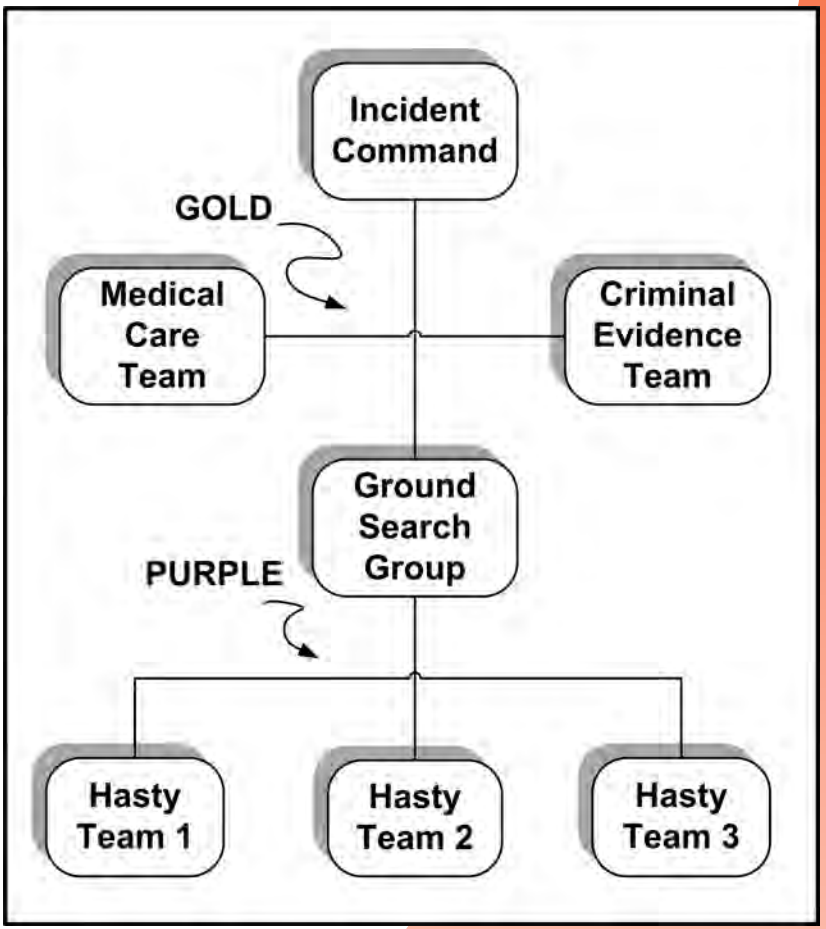
Figure 42: Simple SAR Interagency Communications Plan



If two or more Montana SAR organizations are involved in an incident, the **PURPLE** channel would most appropriately be used for traffic between them. **GOLD** is still appropriate for higher-level command communications. Separate, individually licensed channels, may be used or shared at the team level for coordination.

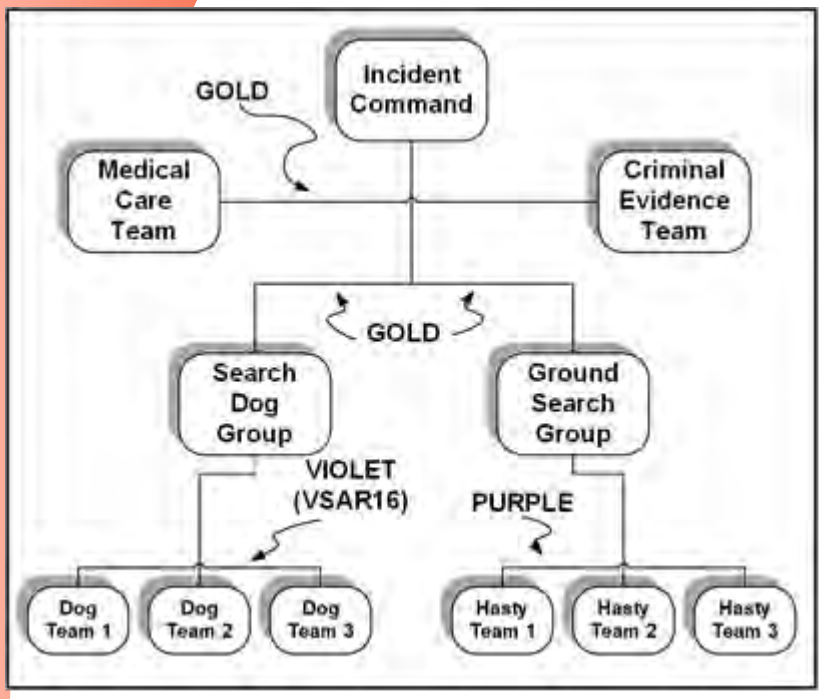
Figure 43 depicts an interagency search involving other public safety services and hasty teams from different Montana SAR organizations.

Figure 43: Interagency Search with SAR Hasty Teams and Other Public Safety Organizations



The most complex SAR communications plan offered here involves multiple Montana SAR teams, resources from outside the state, and other responders. **GOLD** is used at the highest interagency operational level; **PURPLE** is dedicated to communications between Montana SAR teams, and **VIOLET (VSAR16)** to resources from outside Montana who would more likely have this frequency than others. Additional frequencies might be used within the teams for their own coordination. Graphically, it might appear as depicted in Figure 44.

Figure 44: Complex SAR Communications Plan



SAR
SEARCH & RESCUE
S
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Part VIII: Auxiliary Communications

Introduction

Auxiliary Communications (AuxComm) personnel support backup emergency communications for local and/or state public safety entities or for amateur radio organizations supporting public safety. AuxComm is an all-inclusive term used to describe the many organizations and personnel, such as amateur or “ham” radio operators, that provide various types of communications support to emergency management, public safety, and other government agencies. AuxComm personnel are eligible to use mutual aid and common frequencies in the process of providing this support.

The Amateur’s Authority

Amateur radio operators are individually licensed by the FCC under authority of 47 CFR, Part 97 – Amateur Radio Service[8]. The term "amateur" does not imply a lack of skill or quality, but rather that amateur radio operators work outside of an official, governmental or commercial capacity. In addition to FCC licenses, AuxComm personnel must hold a valid mutual aid permit to operate on Montana mutual aid frequencies. Auxiliary communicators need to be knowledgeable of applicable FCC and State of Montana rules and regulations and adhere to the requirements they contain.

AuxComm Organizations

Several organizations exist to support auxiliary communicators and enthusiasts. These are described on the next two pages.

[8] For the complete FCC rules for the Amateur Radio Service, visit: https://www.ecfr.gov/cgi-bin/retrieveECFR?gp=1&SID=2f0e88f7456b441610e0735a9e198c2b&ty=HTML&h=L&mc=true&n=pt47.5.97&r=PART

Amateur Radio Emergency Service (ARES)

The Amateur Radio Emergency Service (ARES) is a corps of trained amateur radio operator volunteers organized to assist in public service and emergency communications. These licensed operators have voluntarily registered their qualifications and equipment for communications duty in service of the public when disaster strikes. State and local coordinators are available to help explain their groups' capabilities. DES officials can often direct interested parties to responsible individuals. For more information, visit: http://www.arrl.org/ares.

American Radio Relay League (ARRL)

The American Radio Relay League (ARRL), a non-profit organization, is the largest membership association of amateur radio enthusiasts in the USA. The ARRL represents the interests of amateur radio operators before federal agencies, such as the U.S. Congress and the FCC. It also supports several educational programs, sponsors emergency communications service and provides technical advice and assistance to amateur radio enthusiasts throughout the country. The ARRL website is: http://www.arrl.org/.

International Amateur Radio Union (IARU)

The International Amateur Radio Union (IARU) is an international confederation of more than 160 national amateur radio organizations from around the world. It provides a forum for amateur radio spectrum concerns, engages in watchdog activities, and promotes amateur radio worldwide. Here is the website: http://www.iaru.org/.

Military Auxiliary Radio System (MARS)

The Military Auxiliary Radio System (MARS) is sponsored by the U.S. Department of Defense and primarily consists of licensed amateur radio operators who assist the military with emergency communications on a local, national and international basis. MARS also provides auxiliary communications during emergencies for military, federal, civil, and/or disaster agencies, such as FEMA and Homeland Security. In addition, it is available to assist state and local emergency response agencies. For more information, visit: https://www.mars.af.mil/.

Radio Amateurs of Canada (RAC)

Radio Amateurs of Canada (RAC) is a not-for-profit membership association that represents the interests of amateur radio across Canada. It serves as a liaison with government agencies and serves as a spokesperson on regulatory and spectrum issues with government and industry leaders. RAC also provides a variety of publications, services and supplies to its members. The RAC website is: http://www.rac.ca/.

Radio Amateur Civil Emergency Service (RACES)

The Radio Amateur Civil Emergency Service (RACES) is a radio service using amateur stations for civil defense communications during periods of local, regional or national civil emergencies. It is provided for in Part 97.407 of FCC rules and regulations governing amateur radio in the United States. In addition to war-related activities, civil emergencies can include natural disasters such as fires, floods and earthquakes. RACES is administered by local/county/state emergency management agencies, with guidance from the Federal Emergency Management Agency (FEMA). For more information about RACES, visit its website at: http://www.usraces.org/.

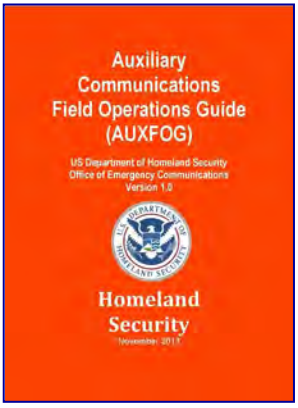
Purpose

To meet the needs of amateur radio organizations, simplex frequencies have been established. The frequencies 146.5200 and 446.000 MHz are simplex frequencies with no receiver tones. The Montana emergency repeater pair set aside is 145.4700 MHz – (Note the minus offset shown as a minus sign [-] behind it; it does not have a PL tone.) The statewide ARES rally frequency is 3.880 MHz, a High Frequency (HF) radio frequency. The statewide RACES rally HF frequency is 3.947 MHz.

Auxiliary Communications Field Operations Guide

The *Auxiliary Communications Field Operations Guide* (AUXFOG), published by the Office of Emergency Communications, is a reference for auxiliary communicators who directly support backup emergency communications for state and local public safety entities or for an amateur radio organization supporting public safety. It contains information about AuxComm best practices, commonly used radio frequencies, technical reference and training materials. In addition, it explains how AuxComm personnel can integrate into a NIMS/Incident Command System (ICS) environment to support communications for planned events or incidents. A copy may be downloaded from:

https://www.cisa.gov/publication/fog-documents



Part IX: Frequency Coordination

Introduction

An agency applying for a license to operate a LMR must submit an FCC application to a frequency coordinator who will process the application and submit it electronically to the FCC. The coordination process is essential to ensure that the numerous systems across the country have clear and interference-free operation on critical public safety radio systems.

Frequency coordination is required when applying for new frequency assignments and for changes to existing licenses that impact use, coverage area, location, power or antenna changes, increased use or other similar technical modification. Frequency coordination is also required to reinstate a license that has expired for more than 30 days. Coordination fees often depend on the extent of a license change.

Licensing Frequencies

Public safety frequencies—including Montana mutual aid and common frequencies—are handled by designated frequency coordinators and must go through coordination prior to FCC approval. Frequency coordination agencies for frequencies below 512 MHz are listed in Table 28 followed by other frequency coordination resource organizations and information about radio licensing for mutual aid fixed base stations.

The FCC has designated the Association of Public-Safety Communications Officials (APCO) as the coordinator for frequencies in the FCC Local Government Radio Service. Applications for license are submitted to APCO's online Spectrumwatch program for processing before being sent to the FCC. APCO uses local advisors in each state for much of the actual coordination work.

Table 32: Frequency Coordinators Below 512 MHz*

Frequency Designation	Contact Information
For frequencies designated with: **PP** = Police **PX** = Any Public Safety, except the Special Emergency in Section 90.20 of FCC rules.	**Association of Public-Safety Communications Officials, Inc. (APCO)** Automated Frequency Coordination Dept. 351 N. Williamson Blvd. Daytona Beach, FL 32114-1112 **Phone:** 888-272-6911 **Fax:** 386-322-2502 **Email:** afc@apcointl.org **Website**: www.apcointl.org/ www.spectrumwatch.com
For frequencies designated with: **PF** = Fire **PM** = Emergency Medical **PX** = Any Public Safety, except the Special Emergency in Section 90.20 of FCC rules.	**International Municipal Signal Association (IMSA)** 424 E. Middle Street, Rear Unit Gettysburg PA 17325 **Phone:** 717-398-0822 **Toll Free:** 855-803-1465 **Fax:** 717-778-4237 **Email:** michelle.fink@frequencycoordination.org **Website:** www.imsasafety.org/
For frequencies designated with: **PO** = Forestry-Conservation **PX** = Any Public Safety, except the Special Emergency in Section 90.20 of FCC rules.	**Forestry Conservation Communications Association (FCCA)** 424 E. Middle Street, Rear Unit Gettysburg, PA 17325 **Phone:** 717-398-0815 **Toll Free:** 855-803-1465 **Fax:** 717-334-5656 **Email:** michelle.fink@frequencycoordination.org **Website:** www.fcca-usa.org/
For frequencies designated with: PH = Highway Maintenance PX = Any Public Safety, except the Special Emergency in Section 90.20 of FCC rules.	**American Association of State Highway and Transportation Officials (AASHTO)** c/o RadioSoft 194 Professional Park Drive Clarkesville GA 30523 **Phone:** 800-262-9206 **Email:** coord@mrfac.com **Website**: www.aashto.org

*Courtesy of https://www.fcc.gov/general/public-safety-frequency-coordinators

Table 32: Frequency Coordinators Below 512 MHz* *(continued)*

Frequency Designation	Contact Information
For frequencies designated with: **PS** = Special Emergency in Section 90.20 of FCC rules.	**Enterprise Wireless Alliance (EWA)** Attn: Frequency Coordination Dept. 2121 Cooperative Way, Suite 225 Herndon, VA 20171 **Phone:** 703-528-5115 **Fax:** 703-524-1074 **Email:** customerservice@enterprisewireless.org **Website:** https://www.enterprisewireless.org/
	Forest Industries Telecommunications (FIT) 1565 Oak Street Eugene, Oregon 97401 **Phone:** Phone: 541-485-8441 **Phone:** 888-583-2929 Chicago **Phone:** 888-342-2929 Dallas **Phone:** 888-355-2929 Los Angeles **Phone:** 888-395-2929 Washington, DC **Fax:** 541-485-7556 **Email:** license@landmobile.com **Website:** https://fcca-usa.org/
	Manufacturers Radio Frequency Advisory Committee, Inc. (MRFAC) c/o RadioSoft 194 Professional Park Drive Clarkesville, GA 30523 **Phone:** 800-262-9206 **Email:** coord@mrfac.com Website: http://mrfac.com/
	Utilities Telecom Council 1129 20th Street NW, Suite 350 Washington, DC 20036 **Phone:** 202-872-0030 **Fax:** 202-872-1331 **Email:** spectrumservices@utc.org **Website**: http://www.utc.org/

* Courtesy of https://www.fcc.gov/general/public-safety-frequency-coordinators

Table 32: Frequency Coordinators Below 512 MHz* *(continued)*

Frequency Designation	Contact Information
For frequencies designated with: **PS** = Special Emergency in Section 90.20 of FCC rules.	**WIA - The Wireless Infrastructure Association** 2111 Wilson Blvd., Suite 210 Arlington, VA 22201 **Phone**: 703-535-7502 **Fax**: 703-836-1608 **Email**: don.andrew@wia.org **Website**: https://wia.org

Frequency Resources

Table 33 presents a list of three other frequency resource organizations.

Table 33: Frequency Resource Organizations

Purpose	Contact Information
Responsible for licensing and policing all state and local public safety frequencies. The FCC-designated frequency coordination organizations are generally the first point of contact for someone wishing to license a radio frequency. Each charges a coordination fee for its services in addition to collecting applicable FCC fees.	**Federal Communications Commission (FCC)** 45 L Street NE Washington, DC 20554 **Phone:** (202) 632-6940 **Toll Free Voice**: 888-CALL FCC (888-225-5322) **Toll Free Fax**: 866-418-0232 http://www.fcc.gov/ **FCC Rules and Regulations** (Title 47, Code of Federal Regulations, Part 90) http://www.gpo.gov/fdsys/pkg/CFR-2010-title47-vol5/pdf/CFR-2010-title47-vol5-part90.pdf

* Courtesy of https://www.fcc.gov/general/public-safety-frequency-coordinators

Table 33: Frequency Resource Organizations *(continued)*

Purpose	Contact Information
The Interdepartment Radio Advisory Committee (IRAC) is responsible for managing federal radio frequencies. It functions under the National Telecommunications Information Administration (NTIA) of the U.S. Department of Commerce. While state and local agencies are not eligible for authorization in the federal spectrum, IRAC and the NTIA may be able to provide valuable information for shared operations or interference problems.	**Interdepartment Radio Advisory Committee (IRAC)** U.S. Department of Commerce/NTIA Herbert C. Hoover Building (HCHB) 1401 Constitution Avenue, N.W. Washington, D.C. 20230 Phone: 202-482-1850 http://www.ntia.doc.gov/ **NTIA Rules and Regulations** (Title 47, Code of Federal Regulations, Part 300) http://www.ntia.doc.gov/osmhome/redbook/redbook.html
NPSTC is a federation of organizations working to improve public safety communications and interoperability.	**National Public Safety Telecommunications Council (NPSTC)** 9615 E County Line Rd, Ste. B-246 Centennial, CO 80112 **Phone:** (720) 509-1564 **Website**: http://npstc.org **Email:** support@npstc.org

Radio Licensing for Mutual Aid Fixed Stations

Montana mutual aid and common frequencies may be licensed by individual agencies under certain conditions. DOJ allows fixed base stations on some mutual aid frequencies. The **GOLD** and **SILVER** frequencies may be licensed for base station use with the FCC through an appropriate public safety frequency coordinator.

The **RUBY** frequency can also be licensed for permanent mutual aid repeaters which use **GARNET** as the input or mobile transmit frequency with the FCC through an appropriate public safety frequency coordinator. Authorization to use **GARNET** in mobiles or temporary control stations is only available by applying for and receiving a mutual aid permit from DOJ.

The **BLUE (VLAW 31)** frequency is available for installation in base stations by one of two means: 1) A jurisdiction eligible to hold authorization to operate radio stations under FCC rules and regulations is eligible to license the frequency for base station use directly with the FCC, or 2) The jurisdiction may apply for and receive a mutual aid permit from the State of Montana. DOJ authorizes the base stations; then, licenses them permanently under the State of Montana Federal Registry Number (FRN).

WHITE, **GRAY** and **PINK** are all intended primarily for base-mobile communications. They are Emergency Medical Service radio frequencies and are coordinated and licensed with the FCC through the International Municipal Signal Association (IMSA). Applications for license are submitted through that organization. Contact information for this organization is provided in Table 32.

In Montana, frequency coordinators strive to make public safety agencies exclusive users within their jurisdictions, but increasing demands make this practice more and more difficult. A single agency is generally established as the primary user of a given frequency within its jurisdiction. Since fixed transmitters are often sited on mountain tops, coordinators must examine interference potentials far beyond that jurisdiction.

Part X: Effective Radio Communication

Introduction

This section explains several radio communication best practices that will serve as a handy reference for anyone who uses a two-way radio. For example, it describes the five priority use levels that are used to permit the most urgent communications to take priority on a frequency. It also provides tips for using good radio etiquette and making your communications more efficient. In addition, the two "phonetic" or spelling alphabets commonly used in public safety communications are provided along with the five-step message acknowledgement sequence.

This section also explains why plain language should be used when speaking on a radio, and it provides a list of standard expressions and their meanings. The section closes with a brief definition of interoperability and an explanation of the SAFECOM Interoperability Continuum. Consider using the information presented here as training and reference material that can assist first responders in being more effective when speaking on a radio.

Priority Use Levels

There may be dozens of users within interference range, so it is important to remember that the primary user of a Montana mutual aid or common frequency is the user with the most urgent traffic. Mutual aid users are asked to remember that these frequencies are a critical shared resource.

The advancement of cellular telephone service has certainly benefited responders during emergency and disaster operations. However, current cell phone technology does not provide priority channels. For instance, if a police officer or fire fighter needs to make an emergency call, there is no guarantee that a cell phone call would go through if there are already a lot of calls on the network. Unfortunately, large areas of Montana, particularly in rural environments, do not have reliable cellular coverage. In addition, cellular phones may become unusable due to overload or outages during wide-area disasters.

Five priority use levels are established for communications on mutual aid and common frequencies. Higher priority traffic takes precedent over lower. These levels are listed in order of priority below.

- Immediate Peril - An immediate threat to human life exists
- Disaster or Extreme Emergency - An imminent threat to human life or of large-scale property destruction exists
- Routine Emergency - Distinguished from the above by scale or nearness of threat
- Urgent Administrative and Itinerant
- Training, Drills and Administrative

Radio Efficiency

To maintain good radio etiquette, operators should observe the following guidelines and rules:

1. Restrict radio traffic to only what is necessary for the safe and efficient operation of the group. Communications equipment should only be used for official business or emergency communications.
2. Know what you're going to say before you key the mike. Keep transmissions as short as possible by being brief and to the point. Don't use big words when short ones will do. Leave out the "Ahs" and "Ohs."
3. Begin and end each transmission with an identifier such as a name or a call which is understood by all radio operators in the group. Avoid the use of first names or CB-type handles.
4. Listen before you begin your transmission, and always wait one or two seconds before you speak after keying the push-to-talk button.
5. Avoid profanity and the use of vulgar language. Such transmissions are expressly forbidden by the FCC in the LMR service.
6. Remain calm and speak directly and clearly, using an even tone. Avoid shouting, which distorts the transmission and does not increase the range of your radio transmission. In response to stress or excitement, you may find yourself increasing your delivery speed. The advantages of a rapid delivery may be lost if the message has to be repeated.
7. Pause your transmission every now and then. This practice ensures that the person on the other end is copying your transmission and also allows others to break in with more important information without walking over your transmission.

8. Don't read everything back because this practice doubles the use of air time. Instead say "Copy, over" and stand by for the next transmission. Use "Say again" for information you didn't copy.
9. Do not use the radio for private "chit-chat" or horseplay.
10. Remember, the whole world is listening. Scanners abound. Comments made on the radio should not be offensive, derogatory or in poor taste.

Spelling Alphabets

Two "phonetic"[9] or spelling alphabets are used in public safety communications: the "International Radiotelephony Spelling Alphabet (IRSA)"[10] and the APCO (Association of Public Safety Communications Officials) Phonetic Alphabet. This alphabet is used by the Los Angeles Police Department (LAPD) and other local and state law enforcement agencies across the United States.

Both of these alphabets are used to spell out parts of a message or call sign that are critical or otherwise hard to recognize during voice communication. Enunciation tends to be lost during radio communication, and individual letters can be miss communicated. Using a spelling alphabet will reduce communication mistakes. Assigning code words to the letters of the English alphabet so that a letter's name begins with the letter itself (Alpha for A, Bravo for B, etc.) helps to ensure the intelligibility of voice communication via radio or telephone. Critical combinations of letters (and numbers) can be pronounced and understood by those who transmit and receive voice messages, regardless of their native language.

When safety is paramount, the use of a spelling alphabet provides additional precision of voice signals. It is advisable to alert the dispatcher or receiver that you will be spelling something before using a phonetic spelling. Also, try to pronounce the word or name prior giving the phonetic spelling. Tables 34 and 35 on the next two pages present the two spelling alphabet versions.

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[9] These are not phonetic alphabets as in those used to guide pronunciation; instead, they are a selection of alphabets often used by radio operators to spell out words.

[10] Also known as the International Civil Aviation Organization (ICAO) Spelling Alphabet or the NATO Phonetic Alphabet.

Table 34: International Radiotelephony Spelling Alphabet

Letter	Phonetic	Spoken As
A	ALPHA	AL-fah
B	BRAVO	BRAH-voh
C	CHARLIE	CHAHR-lee
D	DELTA	DEL-tuh
E	ECHO	EK-oh
F	FOXTROT	FOKS-trot
G	GOLF	GOLF, GAWLF
H	HOTEL	Hoh-TEL
I	INDIA	IN-dee-uh
J	JULIETTE	JOO-lee-uht
K	KILO	KEE-loh
L	LIMA	LEE-mah
M	MIKE	mike, maik
N	NOVEMBER	Noh-VEM-ber
O	OSCAR	OS-ker
P	PAPA	Pah-PAH
Q	QUEBEC	Kwi-BEK
R	ROMEO	ROH-mee-oh
S	SIERRA	See-ER-uh
T	TANGO	TANG-go
U	UNIFORM	YOU-nuh-fawrm
V	VICTOR	VIK-ter
W	WHISKEY	HWIS-kee
X	X-RAY	EKS-rey
Y	YANKEE	YANG-kee
Z	ZULU	ZOO-loo
0	ZERO	ZEER-oh
1	ONE	WUHN
2	TWO	TOO
3	THREE	THUH-ree
4	FOUR	FAWR, FOHR
5	FIVE	FAHYV
6	SIX	SIKS
7	SEVEN	SEV-uhn
8	EIGHT	EYT
9	NINE	NAHY-ner

Table 35: APCO or LAPD Phonetic Alphabet

Letter	Phonetic	Spoken As
A	ADAM	AD-am
B	BOY	BOI
C	CHARLES	CHAHRLZ
D	DAVID	DEY-vid
E	EDWARD	ED-werd
F	FRANK	FRANGK
G	GEORGE	JAWRJ
H	HENRY	Hen-ree
I	IDA	AHY-duh
J	JOHN	JON
K	KING	KING
L	LINCOLN	LING-kuhn
M	MARY	MAIR-ree
N	NORA	NAWR-uh
O	OCEAN	OH-shuhn
P	PAUL	PAWL
Q	QUEEN	KWEEN
R	ROBERT	ROB-ert
S	SAM	SAM
T	TOM	TOM
U	UNION	YOON-yuhn
V	VICTOR	VIK-ter
W	WILLIAM	WIL-yuhm
X	X-RAY	EKS-rey
Y	YOUNG	YUHNG
Z	ZEBRA	ZEE-bruh
0	ZERO	ZEER-oh
1	ONE	WUHN
2	TWO	TOO
3	THREE	THUH-ree
4	FOUR	FAWR, FOHR
5	FIVE	FAHYV
6	SIX	SIKS
7	SEVEN	SEV-uhn
8	EIGHT	EYT
9	NINE	NAHY-ner

Communications-Order Model

To ensure effective understanding between persons communicating via radio equipment, the following five-step, message acknowledgement sequence is suggested. This standard method helps to ensure that messages are received and comprehended effectively, especially during emergency communications.

1. The calling unit provides the name of the called unit, followed by its own. For example: “Headwaters Staging, this is Rae Engine 2,” where the engine is trying to contact the incident staging area.
2. The called unit responds with the reverse (“Rae Engine 2, Headwaters Staging”).
3. The calling unit transmits its message. (“Allow the Belgrade Tactical Team through and direct it to the Command Post.”)
4. The called unit repeats it back as received. (“Belgrade Tactical Team to Command Post.”)
5. If the message was received correctly, the calling unit responds with an “Affirmative” acknowledgement. Otherwise, it responds “Negative” and repeats the message.

Plain Language/Clear Text

A key component of interoperable communications is the ability to communicate using plain language. What is it? Plain Language is defined as: “communication that can be understood by the intended audience and meets the purpose of the communicator.” The use of plain language in daily operations enhances the responder’s ability to support a mutual aid event.

The use of plain language in emergency management and incident response:

- Is a matter of safety.
- Facilitates interoperability across agencies/organizations, jurisdictions and disciplines.
- Ensures that information dissemination is timely, clear, acknowledged, and understood by all intended recipients.

The use of codes — particularly agency-specific and ten-codes — is a barrier when it comes to transmitting information.

While codes may ideally reduce the length of transmissions, in practice the time gained is lost in repeated messages and explanations of unfamiliar terms. Codes or terms used by one jurisdiction or discipline may be incompatible with those used by neighboring agencies. Communications during mutual aid events should be in plain language to avoid miscommunication and confusion, improve interoperability, and enhance public safety.

Plain language simplifies the communication process and reduces the chance of error during an emergency situation. For these reasons, plain language and clear text are strongly encouraged on all mutual aid and common channels.

A critical part of an effective multiagency incident management system is for all communications to be in plain English. Table 36 provides examples of radio codes, acronyms and slang terms that should be avoided and provides plain language and alternatives to use. The use of these terms should be avoided, especially during incidents requiring the participation of multiple agencies or organizations.

Table 36: Radio Terms to be Avoided and Alternatives

Avoid Ten-Codes	Use Plain Language/Clear Text
10-4	"Okay" or "Understood"
10-33" or "Code 33	In one agency this code may mean "emergency traffic," while at an agency a few miles away it may mean "no warrants, past record not checked."
What's your 10-20?	"Where are you?"
10-50	In one jurisdiction, this code may mean "an accident" while in another it may indicate "Dead on Arrival".
Avoid Acronyms	**Spell Out What the Acronym Means**
A.O.S.	Arrived on Scene
A/O	Alert and Oriented
D.O.A.	Dead on Arrival
D.R. or D.R.O	Disaster Relief or Disaster Relief Operation

Table 36: Radio Terms to be Avoided and Alternatives *(continued)*

Avoid Acronyms	Spell Out What the Acronym Means
MCI	Mass (or Multiple) Casualty Incident
MVA	Motor Vehicle Accident (or Auto Accident)
ST	Subject Trapped
Avoid Jargon or Slang	**Use Plain English**
187	Homicide
Band Aid Box	Ambulance
Boot	New Fire Fighter
Catch the Plug	Get hooked up to the fire hydrant
Master Key	Bolt Cutters
Meat Wagon	Ambulance
Pin Job	Auto accident with entrapment
Probie	Probationary First Responder
Taxi Run	Hospital transfer
Vollie	Volunteer

Standard Words and Phrases

The use of standard words and phrases helps to conserve air-time. They are short, easily understood, and they convey concise meaningful information. Standard expressions reduce confusion as well as the amount of time spent transmitting messages. Table 37 presents a list of standard expressions and their meanings.

Table 37: Standard Expressions and Meaning

Standard Radio Expression	Meaning
Acknowledge	Confirms that you understand the message.
Address Check	Responding apparatus requesting that an address be repeated or the calling party be contacted again to confirm the location.

Table 37: Standard Expressions and Meaning *(continued)*

Standard Radio Expression	Meaning
Acknowledge	Confirms that you understand the message.
Address Check	Responding apparatus requesting that an address be repeated or the calling party be contacted again to confirm the location.
Advise	"Give this message to…"
Affirmative	"Yes"
At Scene	Used when Units arrive at the scene of an incident. Example: "Perris, Engine 6183, at scene".
Available at Residence	Used by administrative or staff personnel to indicate they are available and on-call at their residence.
Confirm(ing)	Verify the accuracy of the entire message that was just transmitted and correct it if necessary.
Copy, Copies	Used to acknowledge message received. The Unit radio identifier also must be used. Example: "Engine 2675, copies".
Correct	What has just been transmitted is accurate.
Correction	An error was made in the previous radio transmission. The correct version is…
Disregard	Ignore the previous message/radio traffic.
Do You Copy?	Do you understand? Please acknowledge.
Emergency Traffic	Term used to gain control of radio frequency to report an emergency. All other radio users will refrain from using that frequency until cleared for use by the communications center.
Emergency Traffic Only	Radio users will confine all radio transmissions to the emergency in progress or, if needed, to a new incident. Radio traffic related to status information (such as reports on conditions, "responding," "at scene" and "available") are authorized during this period.
En Route	Resources are heading to the incident.
End Tour	Personnel or apparatus are off duty.
Hold Traffic	All on-air personnel are to cease radio transmissions and traffic.
In-Quarters	Apparatus has safely arrived at a station; if multiple pieces of apparatus arrive in-quarters at once, one piece should transmit the message: "All Station 10 apparatus in-quarters".

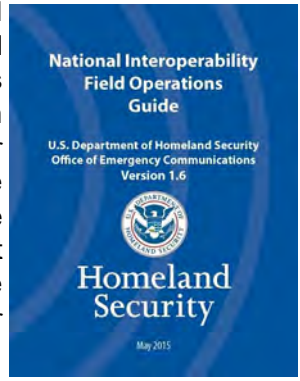
Table 37: Standard Expressions and Meaning *(continued)*

Standard Radio Expression	Meaning
In-Service	Apparatus is mechanically sound, equipment is functional, and able to respond; not synonymous with "ready." Example: "Fortuna, Engine 1283, in-service, fire prevention inspections".
Loud and Clear	The transmission is coming across loudly and clearly.
Negative	"No"
Not Ready	Apparatus is not ready to respond to an incident; not synonymous with "out-of-service".
Okay	Your message is received, understood, and will be complied with.
On Location	Apparatus or personnel have arrived at the scene of an incident, stand-by or event.
Out	Transmission is finished.
Out-of-Service	Apparatus is mechanically disabled or equipment is not functional, and unable to respond to incidents; not synonymous with "not-ready." Example: "Auburn, transport 2341, out of service". Note, when repairs have been completed, the following phrase should be used: "Auburn transport 2341, back".
Over	Information has been passed; waiting for reply.
Priority Traffic	An imminent danger to life, limb, or property exists; not used simply due to heavy radio traffic or to relay routine radio traffic to the dispatcher.
Ready	Apparatus is ready to respond to an incident; not synonymous with "in-service".
Repeat	Repeat your message. I did not understand it the first time.
Respond	Used during dispatch: proceed to or proceeding to an incident. Example: "Engine 5176, respond".
Responding	Given apparatus is responding to an event or incident. Example: "St. Helena, Engine 1375 responding".
Response Check	Verbal inquiry initiated by dispatcher to check if apparatus is responding to an incident.

Table 37: Standard Expressions and Meanings *(continued)*

Standard Radio Expression	Meaning
Resume Normal Traffic	Normal radio traffic may begin again.
Return to	Normally used by communications center to direct available units to a station or other location.
Returning	Apparatus or personnel are leaving the scene of an incident; usually used with terms “ready” or “not-ready”.
Stand By	“Listen but do not transmit until directed to do so”.
Status Air	Apparatus or personnel are away from an assigned location such as a station, performing errands or other tasks.
Stop Transmitting	Stop speaking over the radio.
Test Count	Used for the purposes of testing a specific radio or the radio system infrastructure; a five (5) count will be conducted twice: “1, 2, 3, 4, 5… 5, 4, 3, 2, 1”.
Uncovered	Indicates a unit is not in-service because there are no personnel to operate it.
Understood	Your message is received, understood, and will be complied with.
Unreadable	Used when signal received is not clear. In most cases, try to add the specific trouble. Example: “Unreadable, background noise”.
What is your Location?	Where is the unit located?

National Interoperability Field Operations Guide (NIFOG)



The National Interoperability Field Operations Guide (NIFOG) is a technical reference not only for radio technicians responsible for radios that are to be used in disaster response applications, but also for emergency communications planners. The NIFOG is a useful tool for planners because it provides them with information about interoperability channels most likely to be used in radios of responders from another discipline or jurisdictions.

The NIFOG includes rules and regulations for use of nationwide and other interoperability channels, frequencies and channel names, and other reference material. The online version is available at this website:

https://www.cisa.gov/publication/fog-documents

Relevant tables from the NIFOG appear in Appendices B - D of this manual, as follows:

- **Appendix B:** Non-Federal VHF National Interoperability Channels
- **Appendix C:** Federal/Non-Federal VHF SAR Operations Interoperability Plan
- **Appendix D:** VHF Public Safety Mutual Aid and Common Channels

The U.S. Dept. of Homeland Security recommends having these channels programmed in radios at all times rather than waiting until a disaster is imminent or occurring to do the programming.

What is Interoperability?

Radio "operability" allows first responders access to radio communications systems that provide adequate coverage and features to meet their day-to-day communication requirements while performing basic elements of their jobs. It is anticipated that “operability” will eventually move to “interoperability,” meaning the ability of two or more organizations to communicate and share information (voice, data, images, and video) on demand and in real time, when needed and as authorized.

“Interoperability” is the term that describes how radio communications systems should operate between and among agencies and jurisdictions that respond to common emergencies. Montana recognizes that an agency must be operable before it can be interoperable across agencies and jurisdictions.

Communications interoperability serves as a vital tool for public safety professionals, whether they are responding to a major incident, conducting a task force operation, or coordinating responses to daily events. This capability can provide life-saving support and can streamline response coordination efforts under a myriad of circumstances, including incidents that employ emergency responders from multiple agencies or jurisdictions.

Technology plays a critical role in the achievement of communications interoperability. Equally important, however, is whether or not emergency responders have adequate training and use compatible SOPs. Seamless communications interoperability will be achieved when emergency response officials can be deployed anywhere in the country, can use their own radios to communicate with other responders, and have been trained on SOPs for their respective jurisdictions.

SAFECOM

The Interoperability Continuum

The inside back cover of this publication features the SAFECOM Interoperability Continuum. SAFECOM is a Dept. of Homeland Security program that provides research, guidance and tools on communications-related issues. The Interoperability Continuum was designed to show core dimensions of success that need to be addressed as interoperable solutions are planned and implemented.

These elements include governance, SOPs, technology (both data and voice), training and exercises, and usage of interoperable communications. To gain a true picture of an area's interoperability, progress along all five elements of the continuum must be considered together. For example, when an agency procures new equipment, the agency should plan training and conduct exercises to learn how to make the best use of that equipment.

Local jurisdictions, state and tribal agencies may want to use the Interoperability Continuum as a tool to assess their current level of interoperability so they may determine what elements need further development. To drive progress along the five elements of the continuum and improve interoperability, emergency response practitioners should observe the following principles:

- Gain leadership commitment from all disciplines (Emergency Medical Services [EMS], Fire, Law Enforcement);
- Foster collaboration across disciplines (EMS, Fire, Law Enforcement) through leadership support;
- Interface with policy makers to gain leadership commitment and resource support;
- Use interoperability solutions on a regular basis;
- Plan and budget for ongoing updates to systems, procedures, and documentation;
- Ensure collaboration and coordination across all elements.

For more information, please visit:

https://www.cisa.gov/safecom

Appendix A: NIMS and ICS

Introduction

The National Incident Management System (NIMS) coordinates emergency preparedness and incident management among various federal, tribal, state and local agencies. It is partially based on ICS, which is a set of best practices that have been integrated into a common organizational structure designed to improve emergency response operations. ICS provides standardized response and operational procedures to reduce problems and potential for miscommunication on incidents of all types and complexities. NIMS and ICS help to ensure:

- The safety of responders and others.
- The achievement of tactical objectives.
- The efficient use of resources.

For additional resources on ICS and NIMS, visit:

- **https://www.fema.gov/emergency-managers/nims**
- **https://training.fema.gov/emiweb/is/icsresource/**

This Appendix includes some of the relevant emergency communications protocols and techniques that incident communications plans—all which help to ensure interoperability.

Incident Communications Plans

Communications is the central nervous system of all-hazards emergency response operations. The use of a common communications plan is essential for ensuring that responders can communicate with one another during an incident. Communication equipment, procedures, and systems must be able to operate among multiple jurisdictions and disciplines—including fire, law enforcement and emergency medical services (EMS). Within Montana, mutual aid and common frequencies may be tailored for specific situations.

FEMA

Communications in the ICS Structure

The Communications Unit is often established early in multi-agency and large-scale responses managed under ICS to support an integration effort. This practice is intended to bring all communications functions close to incident command rather than having them managed far away from vital operational concerns.

Structurally, the Communications Unit operates in the Logistics Section, under the Service Branch. It is managed by the Communications Unit Leader (COML). Dispatchers (radio operators) and communications technicians serving the incident also are part of the Unit.

Under COML leadership, the Communications Unit is responsible for integrating wired and wireless communications as well as for ensuring that operations are supported by communications wherever necessary. The COML develops the Incident Radio Communications Plan, ICS Form 205.

The extended plans offered here reflect ICS structure. Information about basic interagency operations, inter-discipline operations, and extended incidents is presented below.

Basic Inter-Agency Operations

Basic inter-agency operations are simplified by mutual aid and common radio frequencies. In the vast majority of instances, using a single common frequency between a few agencies provides all the communications interoperability needed. And most of the communication in those instances is between units of similar function—i.e. deputy sheriff-to-highway patrol officer; rural firefighter-to-city firefighter. This *Mutual Aid Manual* refers to radio contacts between different public safety services as “Inter-Discipline Communications”, which is addressed in the next section.

The incident communications plan for basic (tactical) inter-agency operations is the designated mutual aid frequency for the involved service.

Four frequencies form the core mutual aid resources for use within the following respective disciplines. They are:

- **SILVER - State Law Enforcement Mutual Aid**
- **RED - State Fire Mutual Aid**
- **WHITE - Statewide Hospital-to-Ambulance**
- **PURPLE - Statewide Search and Rescue**

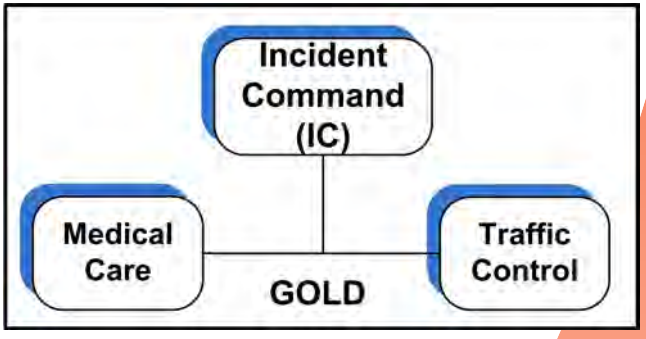
While the **TAN (VMED28)** channel is primarily intended for air-to-ground communications, its inclusion here is to establish it secondarily as a tactical channel asset to be used by EMS in extended incidents.

Inter-Discipline Operations

One frequency has been licensed statewide for inter-discipline use and is the most widely spread among public safety agencies and emergency responders. It is intended as the primary communications channel between different services. It is: **GOLD.**

All Montana public safety radio users have the ability to secure a mutual aid permit to use the **GOLD** frequency. The incident communications plan for a basic inter-discipline operation includes only one channel: **GOLD**. For example, response to a traffic accident may appear as shown in Figure 45 below.

Figure 45



Sample Plan A: A more complex operation may have multiple functions within various public safety services; so, other service-specific frequencies would begin to be used. Figures 46, 48 and 50 show filled-out samples of ICS Form 205 (Radio Incident Communications Plan) for three different incidents. Sample Plan A shown in Figure 47 describes the radio channel utilization depicted in Figure 46. **Note:** The **GOLD** frequency is reserved for inter-discipline use.

INCIDENT RADIO COMMUNICATIONS PLAN (ICS-205)

1. Incident Name:	2. Date/Time	3. Operational Period:	
Sample Plan "A"	Date: 3/12/2016 Time: 0630	Date From: 3/12/2016 Time From: 0700	Date To: 3/13/2016 Time To: 0600

4. Basic Radio Channel Utilization

Zone Grp.	Ch #	Function	Channel Name/Trunked Radio System Talkgroup	Assignment	RX Freq N or W	RX Tone/NAC	TX Freq N or W	TX Tone/NAC	Mode (A, D, or M)	Remarks
	1	Command	GOLD	IC Group Supervisors	153.9050 N	None	153.9050 N	156.7	A	Staging
	2	Tactical	WHITE	Medical Care Group Supervisors & Group Units	155.2800 N	None	155.2800 N	156.7	A	Medical Care
	3	Tactical	RED	HAZMAT Group Supervisors & Group Units	154.0700 N	None	154.0700 N	156.7	A	HAZMAT
	4	Tactical	SILVER	Traffic Control Group Supervisor & Group Units	155.7900 N	None	155.7900 N	156.7	A	Traffic Control

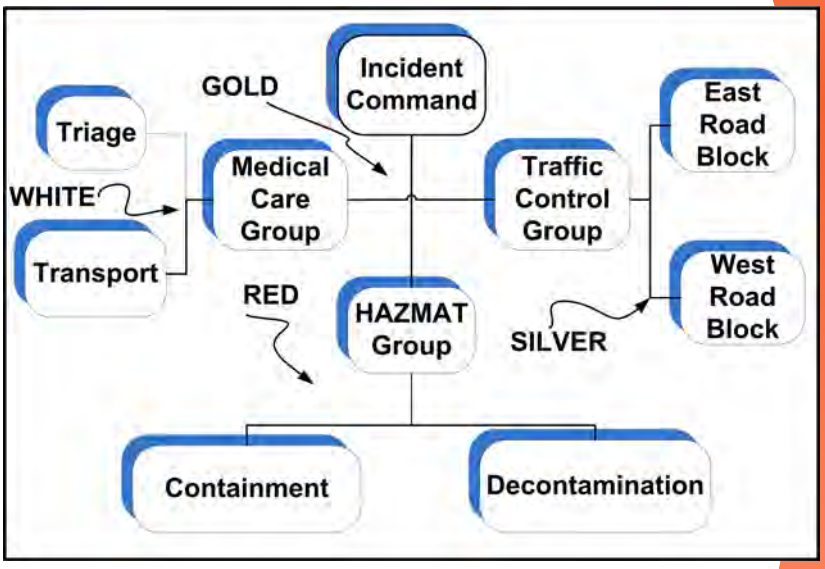
5. Special Instructions:

6. Prepared By (Communications Unit Leader): Name: J. Technical, COML (800) 555-1212 cell Signature: J. Technical

ICS-205	IAP Page	Date/Time: 3/13/2016 0600

Figure 46: Sample Plan A

Figure 47: Diagram of Sample Plan A



Extended Incidents

Sample Plan B: When several units within an agency respond to a multi-agency, multi-discipline incident, a more complex communications plan may be needed. Such cases add at least one more level to the command structure and this should be reflected in the plan. Figure 48 shows the radio channel utilization of Sample Plan B, while Figure 49 diagrams it.

Note: The **GOLD** channel is reserved for the first inter-discipline level of communications and the **RED**, **SILVER** and **TAN (VMED28)** channels are used at the first interagency level within a discipline.

Channels A, B, C and D in Figure 32 represent the agencies' own working frequencies. Subsequent parts of this *Mutual Aid Manual* expand on separate communications plans for law enforcement, fire services, Emergency Medical Services (EMS), Disaster and Emergency Services (DES) and Search and Rescue.

INCIDENT RADIO COMMUNICATIONS PLAN (ICS-205)

1. Incident Name:	2. Date/Time	3. Operational Period:	
Sample Plan "B"	Date: 3/12/2016 Time: 0630	Date From: 3/12/2016 Time From: 0700	Date To: 3/13/2016 Time To: 0600

4. Basic Radio Channel Utilization

Zone Grp.	Ch #	Function	Channel Name/Trunked Radio System Talkgroup	Assignment	RX Freq N or W	RX Tone/NAC	TX Freq N or W	TX Tone/NAC	Mode (A, D, or M)	Remarks
	1	Command	GOLD	IC Group Supervisors	153.9050 N	None	153.9050 N	156.7	A	Staging
	2	Tactical	WHITE	Medical Care Group Supervisors & Group Units	155.2800 N	None	155.2800 N	156.7	A	Medical Care
	3	Tactical	RED	HAZMAT Group Supervisors & Group Units	154.0700 N	None	154.0700 N	156.7	A	HAZMAT
	4	Tactical	SILVER	Traffic Control Group Supervisor & Group Units	155.7900 N	None	155.7900 N	156.7	A	Traffic Control
	5	Tactical	A	Road block team leader & units						Road Block
	6	Tactical	B	Traffic direction team leader & units						Traffic Direction
	7	Tactical	C	Containment team leader & units						Containment
	8	Tactical	D	Decontainment team leader & units						Decontainment

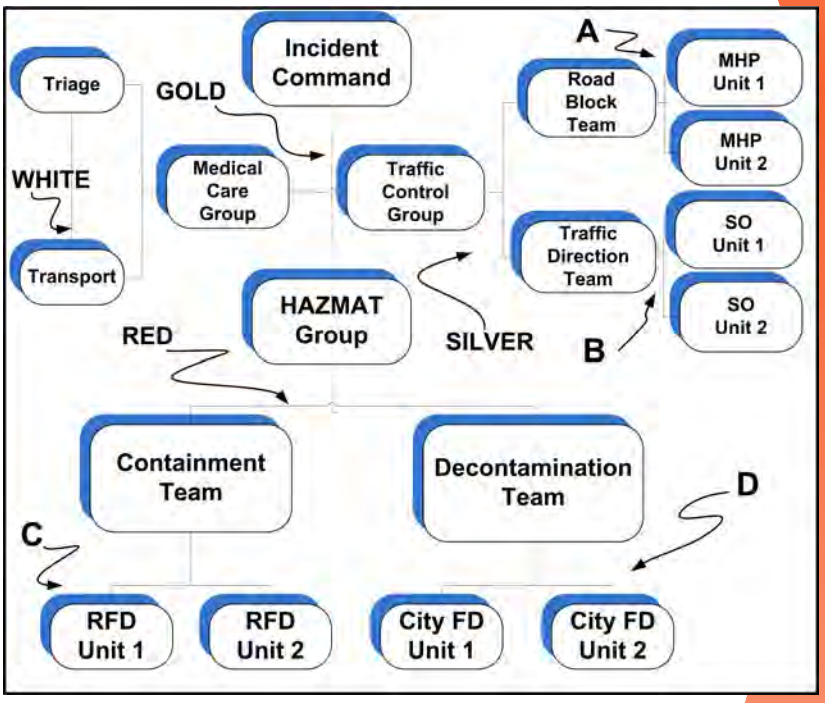
5. Special Instructions:

6. Prepared By (Communications Unit Leader): Name: J. Technical, COML (800) 555-1212 cell Signature: J. Technical

ICS-205	IAP Page	Date/Time: 3/13/2016 0600

Figure 48: Sample Plan B

Figure 49: Diagram of Sample Plan B



Sample Plan C: The most complex plan presented here is one where the magnitude of response would cause an incident commander to give up direct management of operational resources and sub-divide operations activities from other incident management.

In such a case, the operations section would continue using a communications net similar to that illustrated in Figure 50. Minor additions for an extended command structure and a command/ control net have been made. Sample Plan C is described in the radio channel utilization plan depicted in Figure 51.

INCIDENT RADIO COMMUNICATIONS PLAN (ICS-205)

1. Incident Name:	2. Date/Time	3. Operational Period:
Sample Plan "C"	Date: 3/12/2016 Time: 0630	Date From: 3/12/2016 Date To: 3/13/2016 Time From: 0700 Time To: 0600

4. Basic Radio Channel Utilization

Zone Grp.	Ch #	Function	Channel Name/Trunked Radio System Talkgroup	Assignment	RX Freq N or W	RX Tone/NAC	TX Freq N or W	TX Tone/NAC	Mode (A, D, or M)	Remarks
	1	Command	BROWN	ICS Command Staff, General Staff, EOC	155.8200 N	None	155.8200 N	156.7	A	Command
	2	Command	GOLD	IC Group Supervisors	153.9050 N	None	153.9050 N	156.7	A	Operations
	3	Tactical	WHITE	Medical Care Group Supervisors & Group Units	155.2800 N	None	155.2800 N	156.7	A	Medical Care
	4	Tactical	RED	HAZMAT Group Supervisors & Group Units	154.0700 N	None	154.0700 N	156.7	A	HAZMAT
	5	Tactical	SILVER	Traffic Control Group Supervisor & Group Units	155.7900 N	None	155.7900 N	156.7	A	Traffic Control
	6	Tactical	*	Team leaders and their respective units	*					[Team tactical use] * Individual units use their own frequencies for intra-agency communications

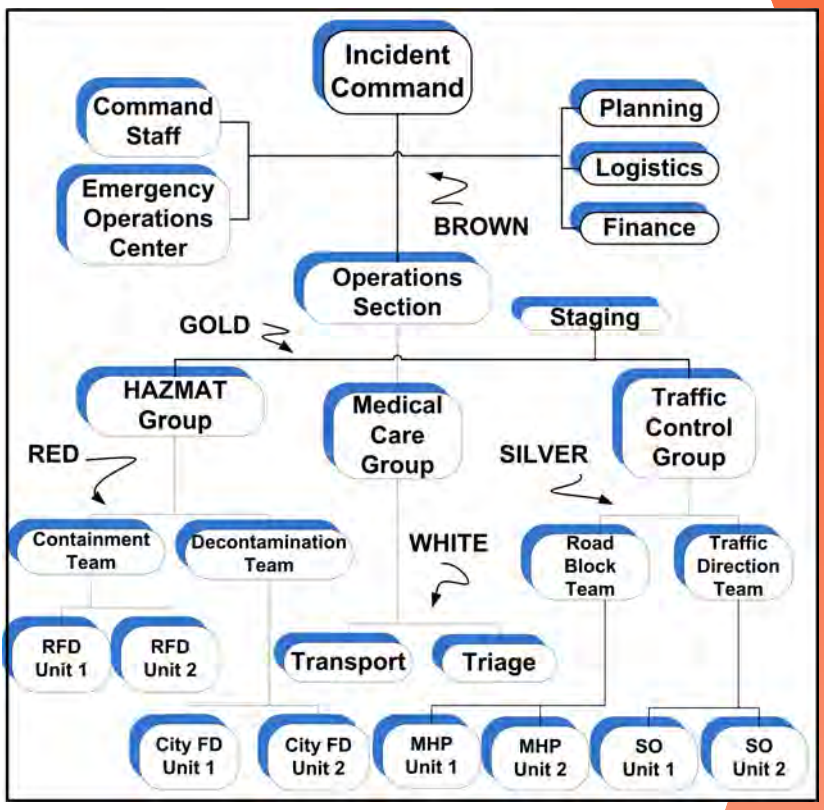
5. Special Instructions:

6. Prepared By (Communications Unit Leader): Name: J. Technical, COML (800) 555-1212 cell Signature: J. Technical

ICS-205	IAP Page	Date/Time: 3/13/2016 0600

Figure 50: Sample Plan C

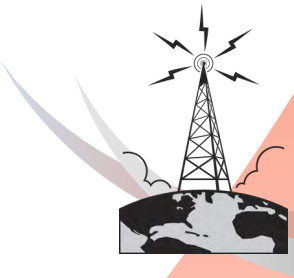
Figure 51: Diagram of Sample Plan C



Note that the **BROWN** frequency (State DES Direction & Control) has been appropriately used in this example for the command/ control function, which is a level above field mutual aid resources.

Two principles span these plans:

1. Frequencies assigned for basic interagency communications remain at the first interagency level from the bottom (**RED**, **SILVER**, and **TAN (VMED28)** in these examples).
2. The primary inter-discipline frequency (**GOLD**) remains at the first inter-discipline level of communications.



Appendix B

Non-Federal VHF National Interoperability Channels

Non-Federal VHF National Interoperability Channels				
Description	**Channel Name**	Mobile RX Freq.	Mobile TX Freq.	**RX and TX CTCSS Tone**
VHF Low Band				
Law Enforcement	LLAW1	39.4600	45.8600	156.7 (5A)
	LLAW1D	39.4600	39.4600	156.7 (5A)
Fire (Proposed)	LFIRE2	39.4800	45.8800	156.7 (5A)
	LFIRE2D	39.4800	39.4800	156.7 (5A)
Law Enforcement	LLAW3	45.8600	39.4600	156.7 (5A)
	LLAW3D	45.8600	45.8600	156.7 (5A)
Fire (Proposed)	LFIRE4	45.8800	39.4800	156.7 (5A)
Fire	LFIRE4D	45.8800	45.8800	156.7 (5A)
Frequency 39.4800 MHz is pending FCC assignment for exclusive fire intersystem use. These channels are WIDEBAND FM, 20 KHz authorized bandwidth.				
VHF High Band				
Calling	VCALL10	155.7525	155.7525	156.7 (5A)
Tactical	VTAC11 *	151.1375	151.1375	156.7 (5A)
Tactical	VTAC12 *	154.4525	154.4525	156.7 (5A)
Tactical	VTAC13	158.7375	158.7375	156.7 (5A)
Tactical	VTAC14	159.4725	159.4725	156.7 (5A)
Tac Rpt	VTAC33 * ▪	159.4725	151.1375	156.7 (5A) 136.5 (4Z)
Tac Rpt	VTAC34 * ▪	158.7375	154.4525	156.7 (5A) 136.5 (4Z)
Tac Rpt	VTAC35 ▪	159.4725	158.7375	156.7 (5A) 136.5 (4Z)
Tac Rpt	VTAC36 * ▪	151.1375	159.4725	156.7 (5A) 136.5 (4Z)
Tac Rpt	VTAC37 * ▪	159.4525	158.7375	156.7 (5A) 136.5 (4Z)
Tac Rpt	VTAC38 ▪	158.7375	159.4725	156.7 (5A) 136.5 (4Z)

* VTAC11-12, VTAC33-34, and VTAC36-37 may not be used in Puerto Rico or the USVI.
▪ VTAC33-38 recommended for deployable tactical repeater use only (FCC Station Class FB2T).
▪ VTAC36-38 are preferred; VTAC33-35 should be used only when necessary due to interference.
All channels on this page are NARROWBAND only. Limited to 3 watts ERP North of Line A or East of Line C.

Appendix C

Federal/Non-Federal VHF SAR Operations Interoperability Plan

Federal/Non-Federal VHF SAR Operations Interoperability Plan	
Suggested SAR Function	Frequency (MHz)
Ground Operations	155.1600 narrowband FM
Maritime Operations *	157.0500 or 157.1500 (VHF Marine ch.21A or 23A) as specified by USCG Sector Commander
Air Operations – civilian	123.1000 MHz AM (may not be used for tests or exercises)
Air Operations – USCG/Military	345.0 MHz AM for initial contact only, then move to 282.8 MHz AM or other working channel.
Air rescue assets-to-air rescue assets (deconfliction)	As charted on standard air chart or MULTICOM 122.850 (south or west sector) & 122.900 MHz (north or east sector), or as specified by FAA. 122.850 may not be used for tests or exercises
Ground-to-Air SAR working channel	157.175 83A (21A, 23A, 81A alternates as specified by local USCG Sector Commander) **
Ground-to-Maritime SAR working channel	157.0500 21A (23A, 81A, 83A alternates as specified by local USCG Sector Commander) **
Maritime/Air/Ground SAR working channel *	157.1750 83A (21A, 23A, 81A alternates as specified by local USCG Sector Commander) **
EMS / Medical Support	155.3400 narrowband FM
Hailing* & DISTRESS only-Maritime/Air/Ground	156.800 VHF Marine channel 16*

* Use VHF Marine ch.16 to make contact (30 seconds max.), then move to appropriate working channel as directed by local USCG Sector Commander. Non-maritime use of any VHF Marine channel requires FCC Special Temporary Authority or appropriate license. VHF marine channels use wideband FM, emission 16K0F3E.

** VHF Marine channels: 16=156.800 21A=157.050 23A=157.150 81A=157.075 83A=157.175 MHz

Direction from USCG, FCC, or FAA overrides information in this table. This table does not convey authority to operate.

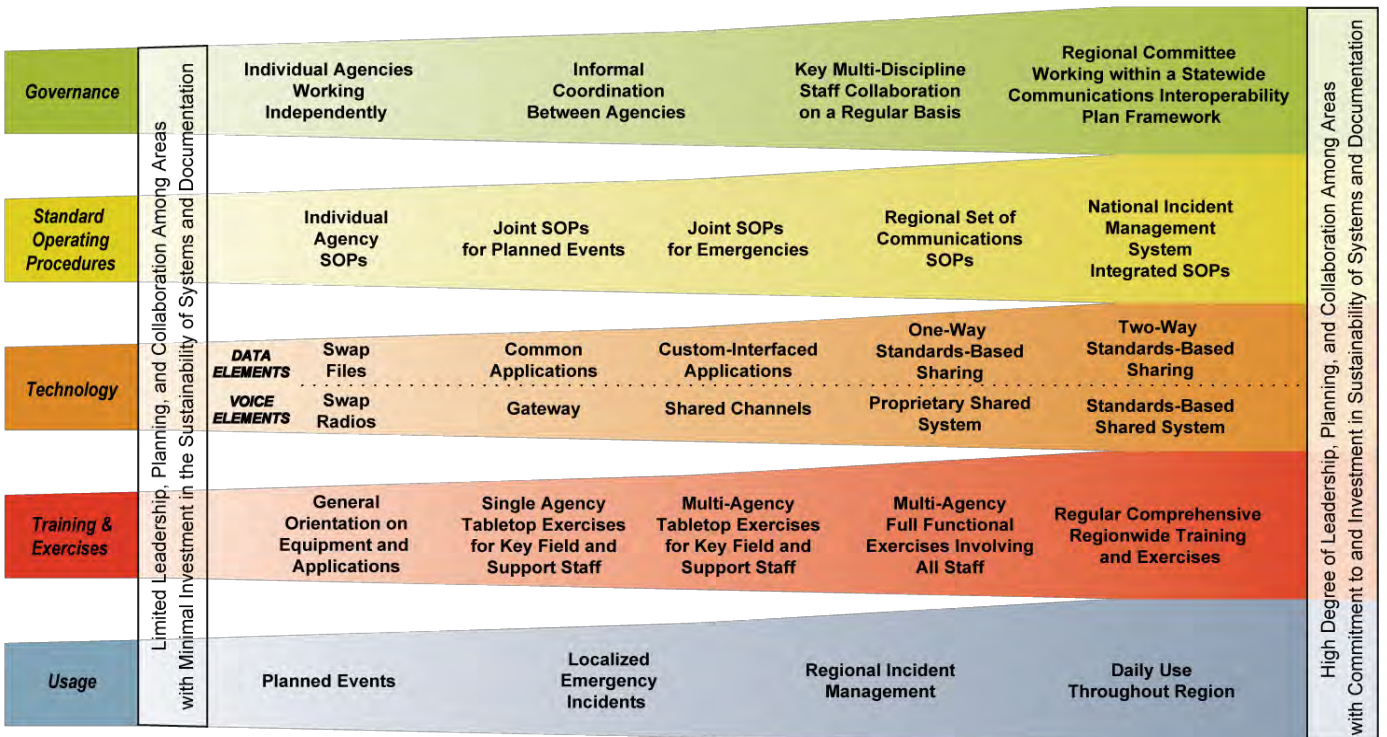
Appendix D

VHF Public Safety Mutual Aid and Common Channels

VHF Public Safety Mutual Aid and Common Channels			
WARNING: These frequencies are NOT covered by the blanket authorization for nationwide interoperability channels. A valid FCC license for these frequencies is required. Availability subject to other licensed users in the same area.			
Frequency (MHz)	Usage	Channel Name	Note
155.1600 base/mobile	Search and Rescue Common (CTCSS 127.3 transmit & receive)	VSAR16 a.k.a. SAR NFM & SAR160	Not restricted to SAR by FCC; availability varies.
154.2800 base/mobile	Fire Mutual Aid	VFIRE21	Not available in Puerto Rico and the U.S. Virgin Islands.
154.2650 base/mobile		VFIRE22	
154.2950 base/mobile		VFIRE23	
154.2725 base/mobile		VFIRE24	
154.2875 base/mobile		VFIRE25	
154.3025 base/mobile		VFIRE26	
155.3400 base/mobile	EMS Mutual Aid	VMED28	May be designated for EMS Mutual Aid.
155.3475 base/mobile		VMED29	
155.4750 base/mobile	Law Enforcement Mutual Aid	VLAW31	
155.4825 base/mobile		VLAW32	
LICENSING REQUIRED - These are NOT nationwide interoperability channels -- CTCSS tones vary by jurisdiction. Rules for use of these channels are contained in 47 CFR 90.20 and NTIA Manual Section 4.3.11 & 7.3.6. See also "Non-Federal VHF National Interoperability Channels" and "Non-Federal VHF Inland Interoperability Channels" in the NIFOG, Version 1.9. EXCEPT for VSAR16, the recommended CTCSS tones are 156.7 receive and transmit for all channels on this page for interoperability; local use may specify other tones.			

Homeland Security

Interoperability Continuum



How to Apply for Mutual Aid Permits:

Permission to use Montana Mutual Aid and Common Frequencies requires an approved Mutual Aid and Common Frequencies permit from the State of Montana, Department of Justice. Applications need to be submitted electronically at:

https://mutualaid.mt.gov

Online Copies and Updates:

https://dojmt.gov/mutual-aid-manual/

All Montana mutual aid frequencies should be programmed using the CTCSS tone of 156.7 on the *transmit* side.

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