

California “SARMARS”

SAR Mutual Aid Radio System

VHF Communications
Interoperability Plan

December 2016



**Cal OES Law Enforcement Branch
Search and Rescue Program**

SARMARS, SAR Mutual Aid Radio System, VHF Communications Plan

BACKGROUND AND PURPOSE:

California's Wilderness Search and Rescue Community has long recognized the need for a Statewide VHF Radio Communications plan for SAR Mutual Aid responses – an almost daily occurrence in California. Yet only a few simplex VHF channels were available and expanded capabilities, especially shared repeated frequencies were not available or possible statewide. With the implementation of NIMS, the federal government has made a number of VHF frequencies available for state and local government agency emergency responses and/or disaster responses. These frequencies were deemed suitable for California SAR operations, Mutual Aid as well as Local, and have been combined with State frequencies available and incorporated into this plan. This plan includes frequency “pairs” now available for temporary or portable repeater use – and this fills a large gap in backcountry SAR VHF radio communications and is intended for mutual aid SAR operations as well as local SAR operations.

California's SAR Coordinators, 58 County Sheriff's Offices as well as all State and Federal Cooperators, along with Cal OES Law Enforcement Branch and Telecommunications Division have assisted in the development of and approval of this plan for statewide use. This plan was presented and approved by the majority of SAR Coordinators present at a regularly scheduled quarterly session, at Cal OES HQ, on January 17th, 2012. It is being published and maintained by the Law Enforcement Branch – SAR Program.

It is recommended that these 14 channels be programmed into SAR agency radio equipment – hand held as well as vehicle and base station (as allowed) as a group, entitled “SARMARS” (Search and Rescue Mutual Aid Radio System), for common operations at incidents.

PRIORITIES OF USE

These priorities will apply to all channels listed under this plan. When a higher priority of use is required, all lower priority use must cease in any area where interference could occur.

1. Disaster and extreme emergency operations, for mutual aid and/or interagency communications.
2. Emergency or urgent operations involving imminent safety of life or property.
3. Special event control activities, generally of a preplanned nature, and generally involving joint participation of two or more agencies.
4. Drills, tests and exercises of a civil defense or disaster nature.
5. Single agency secondary communications

In all instances, all usage must be in strict accordance with the FCC Rules and Regulations and with any other policies prescribed by the licensee.

IMPORTANT NOTE:

All of the channels identified below can be temporarily linked (utilizing the priorities above, except 4) for the duration of test or exercises and incidents, emergencies or disasters to local government public safety channels either directly within a jurisdiction or utilizing the simplex frequencies, also below, between jurisdictions. They can also be linked to each other. The key word here is ‘temporarily’. None of these frequencies can be linked on a permanent or semi permanent basis. For frequency management purposes, the use of these frequencies for tests or exercises and incidents, emergencies or disasters must first be coordinated by Cal OES (and then authorized or not) whether the actual equipment (fixed, mobile or temporary) is owned and/or licensed by Cal OES or other local or state government agencies.

USAGE NOTES:

D – CALCORD – This channel will be used only in mobile and portable units at the scene of any emergency incident requiring coordinate action by more than one agency. These agencies must be eligible to operate in the Public Safety or Special Emergency Radio Services. Use of this system will be limited to emergency operations only, with the exception of tests and drills. Sustained operations must be coordinated with Cal OES Telecommunications Duty Officer via the Warning Center at 916-845-8911.

I – CALAW N (CLEMARS W) / VLAW ALL – Law Enforcement agencies must inform other area (line-of-sight from transmitter location) user agencies when they are involved in high priority usage of CALAW channels. Such notification should be via several of these four forms:

- A broadcast should be made on CALAW N (CLEMARS W)
- A CLETS message to adjoining CALAW N (CLEMARS W) users. Agencies may wish to utilize the California Law Enforcement Telecommunications System (CLETS) “User Group Notification” feature.
- Telephone calls to area frequent users.

NOTE: In **ALL** cases where a CLETS message is sent, please send a copy to mnemonic “OES” in Sacramento. The Warning Center will then notify the Law Enforcement Duty Officer.

NOTE: IT IS HIGHLY ENCOURAGED, in cases where two or more agencies within a line-of-sight (from the transmitter) proximity are requesting a similar priority level clearance for simultaneous operations, that the Cal OES Law Enforcement Duty Officer be contacted via the Warning Center at 916-845-8911 for advice/coordination.

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

K – Cal OES ‘Multi’ CTCSS Tones (in Hz):

Tone 1 – 110.9	Tone 2 – 123.0	Tone 3 – 131.8	Tone 4 – 136.5	Tone 5 – 146.2
Tone 6 – 156.7	Tone 7 – 167.9	Tone 8 – 103.5	Tone 9 – 100.0	Tone 10 – 107.2
Tone 11 – 114.8	Tone 12 – 127.3	Tone 13 – 141.3	Tone 14 – 151.4	Tone 15 – 162.2
Tone 16 – 192.8				

L – VCALL/TAC - California State licenses have been granted for portable repeaters (FB2T) and will be managed and coordinated with the Cal OES Telecommunications Duty Officer via the Warning Center at 916-845-8911 and is otherwise utilized the same as CLEMARS, except these are for use by all disciplines. On VHF, if a jurisdictional or regional repeater frequency is not available, utilize the **VTAC 33-38 NIFOG v1.6.1** frequencies for the repeater. **Default operation should be CTCSS receive of 156.7, CTCSS transmit of 136.5.** If the user can enable/disable without reprogramming the radio, the indicated CTCSS tone also could be programmed for receive, and the user instructed how and when to enable/disable.

NOTE:

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 possible interference.

NOTE:

VCALL/TAC direct and portable repeater frequencies are licensed by/with PSCO/Cal OES and must be coordinated by Cal OES Telecommunications Duty Office via the on duty Cal OES Law Enforcement Coordinator, sending an email to tdo@CalOES.ca.gov or by calling the California Warning Center at 916-845-8911 before use.

M – EXCEPT for VSAR16, the recommended CTCSS tones are 156.7 receive and transmit for all channels except where noted for interoperability; local use may specify other tones for VLAW31 and VLAW32.

N – CALL SIGNS – Used as indicated. These are licensed to the State of California for statewide operation. Letter licenses are required in all cases @) below, FCC Licenses on others (+). Letter licenses must be renewed with the FCC license holder at the FCC license expiration date.

Channel Name	Mob/Port (exp. date)	Temp Base (exp. date)	Port Repeat (exp. date)
CALCORD (@)	KB82490 (06/23/2022)	Not Auth.	Not Auth
VSAR16 +	KNCE436 (11/03/2021)	KNCE436 (11/03/2021)	N/A
CALAW1	KK3942 (07/25/2021)	KMF454 (06/03/2023)	Not Auth.
CALAW2	KK3942 (07/25/2021)	KJF891 (07/22/2021)	Not Auth.
VLAW 31	KK3942 (07/25/2021)	KJF891 (07/22/2021)	Not Auth.
VLAW 32	WQEN775 (03/14/2026)	WQEN775 (03/14/2026)	Not Auth.
VCALL/VTAC (See NOTE L)	WQEN775 (03/14/2026)	WQEN775 (03/14/2026)	WQEN775(03/14/2026)

+ - Cal OES Licenses only. Not available via a letter license. Other agencies need to obtain their own licenses from the FCC.

O – The following are additional frequencies available for Land SAR use and are licensed through the State of California:

155.1600	155.1750
155.2050	155.2200
155.2350	155.2650
155.2800	155.2950

If CTCSS is required on any of these frequencies, try 127.3

COMMUNICATIONS RESOURCE AVAILABILITY WORKSHEET							Frequency Band VHF Hi	Description "SARMARS" California SAR VHF Com Plan 2014	
CH	Channel Configuration	Channel Name/Trunked Radio System Talkgroup	Eligible Users	RX Freq N or W	RX Tone/NAC	TX Freq N or W	Tx Tone/NAC	Mode A, D or M	Remarks / Priority / Usage Notes
1	Sim Mo	VSAR16	SAR	155.1600 N	127.3	155.1600 N	127.3	A	1,2,3 (SEE NOTES BELOW)
2	Sim Base/Mo	CALAW 1	Law	154.9200 N	CSQ	154.9200 N	156.7	A	aka CLEMARS 1 W / 1,2,3,4,5 / I,J
3	Sim Mo	CALAW 2	Law	154.9350 N	CSQ	154.9350 N	156.7	A	aka CLEMARS 2 W / 1,2,3,4,5 / I,J
4	Sim Base/Mo	VLAW31	Law	155.4750 N	156.7	155.4750 N	156.7	A	aka NALEMARS W 1,2 / I
5	Sim Base/Mo	VLAW32	Law	155.4825 N	156.7	155.4825 N	156.7	A	1,2 / I
6	Sim Mo	CALCORD	Any Pub. Safety	156.0750 N	156.7	156.0750 N	156.7	A	*/ 1,2,4 / D,I
7	Sim Base/Mo	VCALL10	Any Pub. Safety	155.7525 N	156.7	155.7525 N	156.7	A	1,2,3,4 / L
8	Sim Base/Mo	VTAC11	Any Pub. Safety	151.1375 N	156.7	151.1375 N	156.7	A	1,2,3,4 / L
9	Repeater	VTAC36	Any Pub. Safety	151.1375 N	156.7	159.4725 N	136.5	A	1,2,3,4 / L , Primary Portable Tactical Repeater
10	Sim Base/Mo	VTAC12	Any Pub. Safety	154.4525 N	156.7	154.4525 N	156.7	A	1,2,3,4 / L
11	Repeater	VTAC37	Any Pub. Safety	154.4525 N	156.7	158.7375 N	136.5	A	1,2,3,4 / L , Secondary Portable Tactical Repeater
12	Sim Base/Mo	VTAC13	Any Pub. Safety	158.7375 N	156.7	158.7375 N	156.7	A	1,2,3,4 / L
13	Repeater	VTAC38	Any Pub. Safety	158.7375 N	156.7	159.4725 N	136.5	A	1,2,3,4 / L, Tertiary Portable Tactical Repeater
14	Sim Base/Mo	VTAC14	Any Pub. Safety	159.4725 N	156.7	159.4725 N	156.7	A	1,2,3,4 / L

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

ICS 217 Date 11/7/2016 11:39 AM

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NOTE: VSAR16 – Name changed to reflect current NIFOG v1.6.1