Tennessee Communications Field Operations Guide (TN COMM FOG)

Version 2.0

June 2012
Public Safety Sensitive

Introduction

The Tennessee Communications Field Operations Guide (TN COMM FOG) is a collection of technical reference material to aid Communications Unit personnel in establishing solutions to support communications during emergency incidents and planned events. The TN COMM FOG includes information from the National Interoperability Field Operations Guide (NIFOG), material from the TN Homeland Security District Five and Memphis Area Tactical Interoperable Communications Plans (TICP), and data from other Tennessee communications documents; formatted as a pocket-sized guide.

The TN COMM FOG contains local, state, and national interoperability channels. These channels should be programmed into all public safety radios in the appropriate frequency band. If geographic restrictions on some channels preclude their use within Tennessee, they may offer an interoperability option when responding out of State where the restrictions do not apply.

Please send updates, corrections, or comments about the TN COMM FOG to lfriedmann@tnema.org.

Thank you,

Louis Friedmann

Louis Friedmann, TN Statewide Interoperability Coordinator
Tennessee Emergency Management Agency (TEMA)

About the Guide

Point of Contact for this Guide

Name:	Louis Friedmann
Title:	TN Statewide Interoperability Coordinator
Address:	3041 Sidco Drive Tennessee Emergency Management Agency Nashville, Tennessee 37204
Phone:	615-741-0985
Fax:	615-741-0007
E-Mail:	lfriedmann@tnema.org

Tennessee Public Safety Wireless Communications Advisory Board (WiCAB) Responsibilities

The Statewide Interoperability Governing Body (SIGB) is the Tennessee Public Safety Wireless Communications Advisory Board (WiCAB). The WiCAB was established in 2007 by Governor's Executive Order #49.

The WiCAB is chaired by the Director of TEMA. The Board consists of 13 members: 11 from State agencies, and two from local government agencies selected by the Governor. State agencies include: TEMA, Bureau of Investigation, Military Department, Wildlife Resources Agency, Agriculture, Corrections, Environment & Conservation, Finance & Administration, Health, Safety, and Transportation. The WiCAB has four standing committees: Planning, Technical, User, and Resources.

The WiCAB was originally established to oversee the planning, design, development, implementation, and maintenance of a statewide wireless interoperable communications system. The WiCAB's responsibilities include activities that support response, strategic planning, technology acquisition, finance/budget, and integrating legacy systems, which includes establishing communications networks between State and local systems. The WiCAB By-Laws are included as an appendix to the Statewide Communications Interoperability Plan (SCIP).

Other plans and SOPs/SOGs pertaining to public safety or interoperable communications relevant to Tennessee include, but are not limited to, the following:

1. EMS Telecommunications Plan
2. FCC Region 39 Plans for 700 & 800 MHz
3. Linked Emergency Telecommunications System (LETS) Talk SOG
4. Homeland Security District 5 Tactical Interoperable Communications Plan (TICP)
5. Memphis Area TICP
6. National Emergency Communications Plan (NECP)
7. State of Tennessee Annex to the FEMA Emergency Communications Plan
8. Tennessee Emergency Management Plan (TEMP)
9. Tennessee Mutual Aid Channel (TMAC) System SOG
10. Tennessee Radio Interoperability Guide (TRIG)
11. Tennessee Statewide Communications Interoperability Plan (SCIP)
12. Tennessee Valley Regional Communications System (TVRCS) SOG

Table of Contents

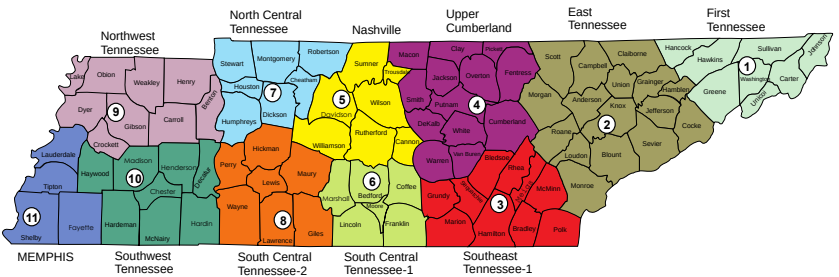
Establishing Interoperability

Recommendations for establishing interoperability among agencies from multiple jurisdictions in support of emergency incidents, disaster situations, and planned events:

1. Establish a common radio frequency for statewide mutual aid and set standard tactical operations frequencies to be programmed in all communications assets owned by the State of Tennessee, and work with local governments to ensure that those same frequencies are programmed into local assets.
2. Direct that each of these mutual aid frequencies is given the same name designation in all State-owned radios, and recommend that those same name designations are utilized across all jurisdictions.
3. Direct that all State emergency response mobile radios have the Tennessee Mutual Aid frequencies programmed in their scan bank. Direct that all emergency response mobile radios participating in the mutual aid system have those same Mutual Aid frequencies programmed in their scan banks.
4. Develop protocol for use of the Tennessee Mutual Aid frequencies by emergency response personnel.
5. Establish an effective process for requesting local or State owned communications assets.
6. Adopt the FEMA typing standards for Mobile Communications Center (MCC) for these assets and establish minimum training requirements for personnel deploying and operating communications assets.
7. A resource listing of Communications assets will be maintained by TEMA and readily available in the event of an emergency for deployment either by agency-to-agency response coordination, or in the case of local assets, response under the State Mutual Aid law.
8. Local Communications assets will become a part of the Statewide Emergency Management Support Team process and will be covered by the procedures for requesting mutual aid support.
9. Guidelines will be developed for training State and local dispatch centers to ensure that TN Mutual Aid channels are installed in dispatch centers. Guidelines will cover monitoring and responding to calls on the mutual aid channels.
10. Guidelines will be developed for establishing interoperable communications through the Incident Command System when on the scene of a multi-agency/multi-jurisdictional response. Strict “net control” must be utilized to ensure that these frequencies are not misused and remain clear for emergencies.

Map - Regional Boundaries

Tennessee Homeland Security Districts



TEMA Contact Information

State Emergency Operations Center
3041 Sidco Drive
Nashville, TN 37204
615-741-0001 24/7 Operations Center
800-262-3300 24/7 Operations Center
Fax: 615-242-9635

TEMA West Region Office
1510 R.E. Bailey Bypass
Jackson, TN 38302
731-422-3300
800-322-7341
Fax: 731-423-6621

TEMA Middle Region Office
1200 Foster Avenue, Bldg. K-4
Nashville, TN 37211
615-741-7342
800-422-7342
Fax: 615-741-0498

TEMA East Region Office
803 North Concord
Knoxville, TN 37919
865-594-5650
800-533-7343
Fax: 865-594-5668

Map - TEMA West Region

Map - TEMA Middle Region

Map - TEMA East Region

Mutual Aid and Interoperability Frequency Listings

VHF Non-Federal Nationwide Interoperability Channel List

Channel Name	Assignment	RX Freq N or W	RX Tone/NAC	TX Freq N or W	Tx Tone/NAC	Mode A, D or M
VCALL10	Multi-Disc.	155.7525 N	156.7 / 293	155.7525 N	156.7 / 293	A, D
VTAC11	Multi-Disc.	151.1375 N	156.7 / 293	151.1375 N	156.7 / 293	A, D
VTAC12	Multi-Disc.	154.4525 N	156.7 / 293	154.4525 N	156.7 / 293	A, D
VTAC13	Multi-Disc.	158.7375 N	156.7 / 293	158.7375 N	156.7 / 293	A, D
VTAC14	Multi-Disc.	159.4725 N	156.7 / 293	159.4725 N	156.7 / 293	A, D
VTAC33 *	Multi-Disc.	159.4725 N	136.5 / 293	151.1375 N	136.5 / 293	A, D
VTAC34 *	Multi-Disc.	158.7375 N	136.5 / 293	154.4525 N	136.5 / 293	A, D
VTAC35 *	Multi-Disc.	159.4725 N	136.5 / 293	158.7375 N	136.5 / 293	A, D
VTAC36 *	Multi-Disc.	151.1375 N	136.5 / 293	159.4725 N	136.5 / 293	A, D
VTAC37 *	Multi-Disc.	154.4525 N	136.5 / 293	158.7375 N	136.5 / 293	A, D
VTAC38 *	Multi-Disc.	158.7375 N	136.5 / 293	159.4725 N	136.5 / 293	A, D

NOTES

All frequencies are narrowband (11K0F3E) only.
Radio channel names as listed in this Table are **required**.
* VTAC 33-38 recommended for deployable tactical repeater use only (FCC Station Class FB2T). VTAC 36-38 are preferred, VTAC 33-35 should be used only when necessary due to interference.

VHF TN Channel List

Channel Name	Assignment	RX Freq N or W	RX Tone/NAC	TX Freq N or W	Tx Tone/NAC	Mode A, D or M
LLAW3D [1]	Law Enf.	45.8600 W	156.7	45.8600 W	156.7	A
LFIRE4D	Fire	45.8800 W	156.7	45.8800 W	156.7	A
VTNMA	Multi-Disc.	154.7550 N	100.0 / 293	156.0150 N	100.0 / 293	A, D
VTNMAD	Multi-Disc.	154.7550 N	100.0 / 293	154.7550 N	100.0 / 293	A, D
VTNTAC	Multi-Disc.	159.7050 N	156.7 / 293	159.7050 N	156.7 / 293	A, D
INTERCITY [2]	Multi-Disc.	155.3700 N	CSQ	155.3700 N	CSQ	A
VFIRE21	Fire	154.2800 N	156.7 / 293	154.2800 N	156.7 / 293	A, D
VFIRE22	Fire	154.2650 N	156.7 / 293	154.2650 N	156.7 / 293	A, D
VFIRE23	Fire	154.2950 N	156.7 / 293	154.2950 N	156.7 / 293	A, D
VFIRE24 [4]	Fire	154.2725 N	156.7 / 293	154.2725 N	156.7 / 293	A, D
VFIRE25 [4]	Fire	154.2875 N	156.7 / 293	154.2875 N	156.7 / 293	A, D
VFIRE26 [4]	Fire	154.3025 N	156.7 / 293	154.3025 N	156.7 / 293	A, D
VLAW31 [1]	Law Enf.	155.4750 N	156.7 / 293	155.4750 N	156.7 / 293	A, D
VLAW32 [1,4]	Law Enf.	155.4825 N	156.7 / 293	155.4825 N	156.7 / 293	A, D
VEMS205 [3,5]	EMS	155.2050 N	D205	155.2050 N	D205	A
VEMS295 [3]	EMS	155.2950 N	D155	155.2950 N	D155	A
VEMS340[3]	EMS	155.3400 N	CSQ	155.3400 N	CSQ	A

NOTES

1-Law Enforcement usage only.
2-Base usage only.
3-Governed by FCC & TN Dept. of Health EMS Telecommunications Plan.
4-Narrowband usage only.
5-Mobile Usage Only

UHF Non-Federal Nationwide Interoperability Channel List

Channel Name	Assignment	RX Freq N or W	RX Tone/NAC	TX Freq N or W	Tx Tone/NAC	Mode A, D or M
UCALL40	Multi-Disc.	453.2125 N	156.7 / 293	458.2125 N	156.7 / 293	A, D
UCALL40D	Multi-Disc.	453.2125 N	156.7 / 293	453.2125 N	156.7 / 293	A, D
UTAC41	Multi-Disc.	453.4625 N	156.7 / 293	458.4625 N	156.7 / 293	A, D
UTAC41D	Multi-Disc.	453.4625 N	156.7 / 293	453.4625 N	156.7 / 293	A, D
UTAC42	Multi-Disc.	453.7125 N	156.7 / 293	458.7125 N	156.7 / 293	A, D
UTAC42D	Multi-Disc.	453.7125 N	156.7 / 293	453.7125 N	156.7 / 293	A, D
UTAC43	Multi-Disc.	453.8625 N	156.7 / 293	458.8625 N	156.7 / 293	A, D
UTAC43D	Multi-Disc.	453.8625 N	156.7 / 293	453.8625 N	156.7 / 293	A, D

NOTES

All frequencies are narrowband (11K0F3E) only.
Radio channel names as listed in this Table are **required**.

UHF TN Channel List

Channel Name	Assignment	RX Freq N or W	RX Tone/NAC	TX Freq N or W	Tx Tone/NAC	Mode A, D or M
UTNMA	Multi-Disc.	460.4000 N	127.3 / 293	465.4000 N	127.3 / 293	A, D
UTNMAD	Multi-Disc.	460.4000 N	127.3 / 293	460.4000 N	127.3 / 293	A, D
UTNTAC44 [1]	Law Enf.	460.3875 N	156.7 / 293	465.3875 N	156.7 / 293	A, D
UTNTAC44D [1]	Law Enf.	460.3875 N	156.7 / 293	460.3875 N	156.7 / 293	A, D
UTNTAC45 [1]	Law Enf.	460.4125 N	156.7 / 293	465.4125 N	156.7 / 293	A, D
UTNTAC45D [1]	Law Enf.	460.4125 N	156.7 / 293	460.4125 N	156.7 / 293	A, D
UEMSTAC [3,4]	EMS	463.1875 N	156.7 / 293	468.1875 N	156.7 / 293	A, D
UEMSTACD [3,4]	EMS	463.1875 N	156.7 / 293	463.1875 N	156.7 / 293	A, D

NOTES

1-Law Enforcement Primary usage.
2-Base usage only.
3-Governed by FCC & TN Dept. of Health EMS Telecommunications Plan.
4-Narrowband usage only/EMS Primary usage.

UHF Nationwide MED Channel List (Page 1 / 2)

Channel Name	Assignment	RX Freq N or W	RX Tone/NAC	TX Freq N or W	Tx Tone/NAC	Mode A, D or M
MED 1	EMS	463.00000 N	Regional	468.00000 N	Regional	A
MED 11	EMS	463.00625 N	Regional	468.00625 N	Regional	A
MED 12	EMS	463.01250 N	Regional	468.01250 N	Regional	A
MED 13*	EMS	463.01875 N	Regional	468.01875 N	Regional	A
MED 2	EMS	463.02500 N	Regional	468.02500 N	Regional	A
MED 21	EMS	463.03125 N	Regional	468.03125 N	Regional	A
MED 22	EMS	463.03750 N	Regional	468.03750 N	Regional	A
MED 23*	EMS	463.04375 N	Regional	468.04375 N	Regional	A
MED 3	EMS	463.05000 N	Regional	468.05000 N	Regional	A
MED 31	EMS	463.05625 N	Regional	468.05625 N	Regional	A
MED 32	EMS	463.06250 N	Regional	468.06250 N	Regional	A
MED 33*	EMS	463.06875 N	Regional	468.06875 N	Regional	A
MED 4	EMS	463.07500 N	Regional	468.07500 N	Regional	A
MED 41	EMS	463.08125 N	Regional	468.08125 N	Regional	A
MED 42	EMS	463.08750 N	Regional	468.08750 N	Regional	A
MED 43*	EMS	463.09375 N	Regional	468.09375 N	Regional	A
MED 5	EMS	463.10000 N	Regional	468.10000 N	Regional	A
MED 51	EMS	463.10625 N	Regional	468.10625 N	Regional	A
MED 52	EMS	463.11250 N	Regional	468.11250 N	Regional	A
MED 53*	EMS	463.11875 N	Regional	468.11875 N	Regional	A

NOTES

Refer to TN EMS Telecommunications Plan for Additional Details.

MED 1-83: Patient Reporting / Medical Direction **MED 9-103:** Command & Control / Dispatch, Assignment

* Indicates 6.25 KHz channel spacing

UHF Nationwide MED Channel List (Page 2 / 2)

Channel Name	Assignment	RX Freq N or W	RX Tone/NAC	TX Freq N or W	Tx Tone/NAC	Mode A, D or M
MED 6	EMS	463.12500 N	Regional	468.12500 N	Regional	A
MED 61	EMS	463.13125 N	Regional	468.13125 N	Regional	A
MED 62	EMS	463.13750 N	Regional	468.13750 N	Regional	A
MED 63*	EMS	463.14375 N	Regional	468.14375 N	Regional	A
MED 7	EMS	463.15000 N	Regional	468.15000 N	Regional	A
MED 71	EMS	463.15625 N	Regional	468.15625 N	Regional	A
MED 72 **	EMS	463.16250 N	Regional	468.16250 N	Regional	A
MED 73*	EMS	463.16875 N	Regional	468.16875 N	Regional	A
MED 8	EMS	463.17500 N	Regional	468.17500 N	Regional	A
MED 81	EMS	463.18125 N	Regional	468.18125 N	Regional	A
MED 82 ***	EMS	463.18750 N	156.7 / 293	468.18750 N	156.7 / 293	A, D
MED 83*	EMS	463.19375 N	Regional	468.19375 N	Regional	A
MED 9	EMS	462.95000 N	Regional	467.95000 N	Regional	A
MED 91	EMS	462.95625 N	Regional	467.95625 N	Regional	A
MED 92	EMS	462.96875 N	Regional	467.96875 N	Regional	A
MED 93*	EMS	462.96875 N	Regional	467.96875 N	Regional	A
MED 10	EMS	462.97500 N	Regional	467.97500 N	Regional	A
MED 101	EMS	462.98125 N	Regional	467.98125 N	Regional	A
MED 102	EMS	462.98750 N	Regional	467.98750 N	Regional	A
MED 103*	EMS	462.99375 N	Regional	467.99375 N	Regional	A

NOTES

***** Indicates 6.25 KHz channel spacing

**** MED 72:** Used for MED-Talk System in HSD5 / Medical Coordination, Multi-Casualty Incidents, Exercises, Planned Events

***** MED 82:** UEMSTAC & UEMSTACD Statewide TN

700 MHz Region 39, Tennessee, Interoperability Channel List

Channel Name	Assignment	RX Freq	RX Tone/NAC	TX Freq	Tx Tone/NAC	Mode A, D or M
7CALL50	Calling	769.24375	293	799.24375	293	D
7CALL50D	Call Direct	769.24375	293	769.24375	293	D
7TAC55	Multi-Disc.	769.74375	293	799.74375	293	D
7TAC55D	Multi-Disc.	769.74375	293	769.74375	293	D
7MOB59	Mob. Rptr.	770.89375	293	800.89375	293	D
7MOB59D	Mob. Rptr. Dir.	770.89375	293	770.89375	293	D
7GTAC57	Multi-Disc.	770.99375	293	800.99375	293	D
7GTAC57D	Multi-Disc.	770.99375	293	770.99375	293	D
7CALL70	Calling	773.25625	293	803.25625	293	D
7CALL70D	Call Direct	773.25625	293	773.25625	293	D
7TAC75	Multi-Disc.	773.75625	293	803.75625	293	D
7TAC75D	Multi-Disc.	773.75625	293	773.75625	293	D
7MOB79	Mob. Rptr.	774.50625	293	804.50625	293	D
7MOB79D	Mob. Rptr. Dir.	774.50625	293	774.50625	293	D
7GTAC77	Multi-Disc.	774.85625	293	804.85625	293	D
7GTAC77D	Multi-Disc.	774.85625	293	774.85625	293	D

NOTES

Mandatory 12.5 KHz, P25 digital using NAC 293.
Channel names in this table are required.
For direct / simplex operations, use RX frequency (base transmit).
Refer to Region 39 (TN) 700 MHz Plan for additional details and frequency listings.
The frequencies listed above are available nationwide.

800 MHz NPSPAC Nationwide Interoperability Channel List

Channel Name	Assignment	RX Freq	RX Tone/NAC	TX Freq	Tx Tone/NAC	Mode A, D or M
8CALL90	Multi-Disc.	851.01250	156.7	806.01250	156.7	A
8CALL90D	Multi-Disc.	851.01250	156.7 / 293	851.01250	156.7 / 293	A, D
8TAC91	Multi-Disc.	851.51250	156.7 / 293	806.51250	156.7 / 293	A, D
8TAC91D	Multi-Disc.	851.51250	156.7 / 293	851.51250	156.7 / 293	A, D
8TAC92	Multi-Disc.	852.01250	156.7 / 293	807.01250	156.7 / 293	A, D
8TAC92D	Multi-Disc.	852.01250	156.7 / 293	852.01250	156.7 / 293	A, D
8TAC93	Multi-Disc.	852.51250	156.7 / 293	807.51250	156.7 / 293	A, D
8TAC93D	Multi-Disc.	852.51250	156.7 / 293	852.51250	156.7 / 293	A, D
8TAC94	Multi-Disc.	853.01250	156.7 / 293	808.01250	156.7 / 293	A, D
8TAC94D	Multi-Disc.	853.01250	156.7 / 293	853.01250	156.7 / 293	A, D

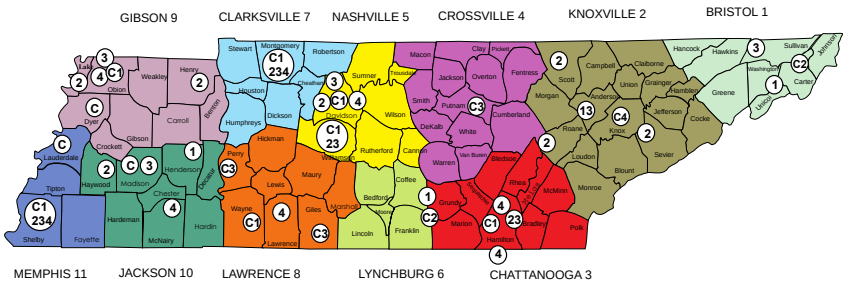
NOTES

A FCC license is not required for mobile or portable use as long as an agency is a valid Public Safety FCC radio license holder. Any permanent use as a base station, repeater or control station requires an FCC radio license and approval from Tennessee Region 39 NPSPAC. The 800 MHz radio channels are governed by the FCC as well as Tennessee Region 39 800MHz Regional Planning Committee.

Radio channel names as listed in this Table are **required**.

Map - 800 MHz NPSPAC Repeater Sites

TN 800 MHz INTEROP REPEATERS



For the most current version of the repeater map, refer to the TN Community on NIIX (www.niix.org)

Notice: The county colors represent a Homeland Security District. The white circles represent approximate repeater locations. The letters and numbers inside the circles represent the interop channels. C is the calling channel and 1 is tactical channel 1. C1 indicates both a calling and a tactical channel 1 at the same location. Two numbers indicated two repeaters at the same location. Memphis/Shelby County and Clarksville/Montgomery County have all five repeaters at the same site. Individual control stations are not represented but most agencies with 800 MHz trunked systems also have control stations. TEMA has control stations in all major areas monitored at the State EOC. Where TEMA does not have a control station there is an agreement with another agency or with local government to monitor and answer the calling channel.

800 MHz TN & TMAC Repeater System Frequency List

Control Channel Name	Assignment	RX Freq	RX Tone/NAC	TX Freq	Tx Tone/NAC	Mode A, D or M
Bristol	Multi-Disc.	853.35000	D205	808.35000	D205	A
Knoxville	Multi-Disc.	851.37500	D205	806.37500	D205	A
Chattanooga	Multi-Disc.	852.15000	D205	807.15000	D205	A
Crossville	Multi-Disc.	851.83750	D205	806.83750	D205	A
Nashville	Multi-Disc.	851.35000	D205	806.35000	D205	A
Lynchburg	Multi-Disc.	853.06250	D205	808.06250	D205	A
Clarksville	Multi-Disc.	853.42500	D205	808.42500	D205	A
Lawrence	Multi-Disc.	852.22500	D205	807.22500	D205	A
Gibson	Multi-Disc.	851.40000	D205	806.40000	D205	A
Jackson	Multi-Disc.	852.55000	D205	807.55000	D205	A
Memphis	Multi-Disc.	852.15000	D205	807.15000	D205	A
8TNMA	Multi-Disc.	854.18750	156.7	809.18750	156.7	A
8TNTAC	Multi-Disc.	854.48750	156.7	809.48750	156.7	A

NOTES

Frequency Use Agreement with TEMA required for TMAC Usage. MDC1200 PTT ID required at **end** of transmission.
TMAC System regulated in accordance with TMAC SOG.
The use of encryption is not supported or permitted when using TMAC repeaters. Encryption is permitted only on the TAC channels in the Direct Mode.
8TNMA and 8TNTAC not affected by 800 MHz rebanding.

800 MHz TN & TMAC System DIRECT Frequency List

Control Channel Name	Assignment	RX Freq	RX Tone/NAC	TX Freq	Tx Tone/NAC	Mode A, D or M
Bristol	Multi-Disc.	853.35000	D205 / 293	853.35000	D205 / 293	A, D
Knoxville	Multi-Disc.	851.37500	D205 / 293	851.37500	D205 / 293	A, D
Chattanooga	Multi-Disc.	852.15000	D205 / 293	852.15000	D205 / 293	A, D
Crossville	Multi-Disc.	851.83750	D205 / 293	851.83750	D205 / 293	A, D
Nashville	Multi-Disc.	851.35000	D205 / 293	851.35000	D205 / 293	A, D
Lynchburg	Multi-Disc.	853.06250	D205 / 293	853.06250	D205 / 293	A, D
Clarksville	Multi-Disc.	853.42500	D205 / 293	853.42500	D205 / 293	A, D
Lawrence	Multi-Disc.	852.22500	D205 / 293	852.22500	D205 / 293	A, D
Gibson	Multi-Disc.	851.40000	D205 / 293	851.40000	D205 / 293	A, D
Jackson	Multi-Disc.	852.55000	D205 / 293	852.55000	D205 / 293	A, D
Memphis	Multi-Disc.	852.15000	D205 / 293	852.15000	D205 / 293	A, D
8TNMAD	Multi-Disc.	854.18750	156.7	854.18750	156.7	A
8TNTACD	Multi-Disc.	854.48750	156.7	854.48750	156.7	A, D

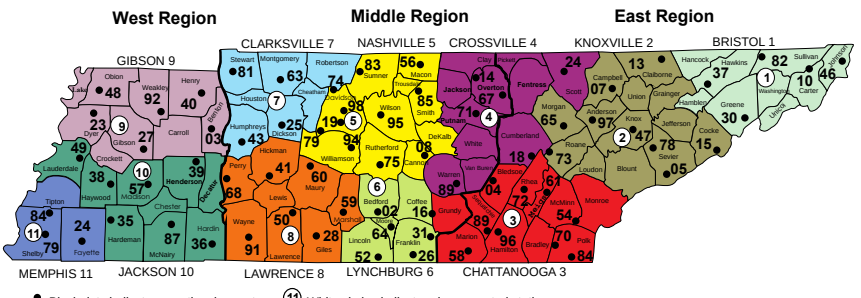
NOTES

Frequency Use Agreement with TEMA required for TMAC Usage. MDC1200 PTT ID required at **end** of transmission.
TMAC System regulated in accordance with TMAC SOG.
Encryption is permitted only on the TAC channels in the Direct Mode.

Map - TMAC Repeater Sites

TEMA 800 MHz Mutual Aid Radio Communications (TMAC)

For Official Use Only (FOUO)



For the most current version of the repeater map, refer to the TN Community on NIIX (www.niix.org)

NOTICE: The county colors represent a repeater frequency and are in a unified control station area. That area is the approximate radio coverage from the control station and associated repeaters. Each area and control station are in a corresponding HLS district. The control stations are numbers inside white circles and the backup control stations are inside ghost green circles. All control stations are connected to the State EOC in Nashville. Black repeater numbers are operational and sites that are yellow or blue represent stations under construction.

Radio Template Programming Requirements

VHF TN Minimum Required Channels

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
VCALL10	Multi-Disc.	155.7525 N	156.7 / 293	155.7525 N	156.7 / 293	A, D
VTAC11	Multi-Disc.	151.1375 N	156.7 / 293	151.1375 N	156.7 / 293	A, D
VTAC12	Multi-Disc.	154.4525 N	156.7 / 293	154.4525 N	156.7 / 293	A, D
VTAC13	Multi-Disc.	158.7375 N	156.7 / 293	158.7375 N	156.7 / 293	A, D
VTAC14	Multi-Disc.	159.4725 N	156.7 / 293	159.4725 N	156.7 / 293	A, D
VTAC33	Multi-Disc.	159.4725 N	136.5 / 293	151.1375 N	136.5 / 293	A, D
VTAC34	Multi-Disc.	158.7375 N	136.5 / 293	154.4525 N	136.5 / 293	A, D
VTAC35	Multi-Disc.	159.4725 N	136.5 / 293	158.7375 N	136.5 / 293	A, D
VTAC36	Multi-Disc.	151.1375 N	136.5 / 293	159.4725 N	136.5 / 293	A, D
VTAC37	Multi-Disc.	154.4525 N	136.5 / 293	158.7375 N	136.5 / 293	A, D
VTAC38	Multi-Disc.	158.7375 N	136.5 / 293	159.4725 N	136.5 / 293	A, D
VTNMA	Multi-Disc.	154.7550 N	100.0 / 293	156.0150 N	100.0 / 293	A, D
VTNMAD	Multi-Disc.	154.7550 N	100.0 / 293	154.7550 N	100.0 / 293	A, D
VTNTAC	Multi-Disc.	159.7050 N	156.7 / 293	159.7050 N	156.7 / 293	A, D

NOTES

The VHF Tennessee Mutual Aid Channel (VTNMA) is the State's agreed upon interoperability channel for all State-owned radios.

VHF Law Enforcement / Corrections Minimum Required Channels

Channel Name/Trunked Radio System Talkgroup	RX Freq N or W	RX Tone/NAC	TX Freq N or W	Tx Tone/NAC	Notes
VCALL10 / VTAC11-14 / VTAC33-38 FROM PAGE 19 PLUS CHANNELS BELOW:					
VTNMA	154.7550 N	100.0 / 293	156.0150 N	100.0 / 293	Statewide Mutual Aid
VTNMAD	154.7550 N	100.0 / 293	154.7550 N	100.0 / 293	Direct for VTNMA
VTNTAC	159.7050 N	156.7 / 293	159.7050 N	156.7 / 293	TN TAC Channel
VLAW31	155.4750 N	156.7	155.4750 N	156.7	National Law Enf. Emergency
VLAW32	155.4825 N	156.7	155.4825 N	156.7	National Law Enf. Emergency

VHF Fire / EMA / First Responder Minimum Required Channels

Channel Name/Trunked Radio System Talkgroup	RX Freq N or W	RX Tone/NAC	TX Freq N or W	Tx Tone/NAC	Notes
VCALL10 / VTAC11-14 / VTAC33-38 FROM PAGE 19 PLUS CHANNELS BELOW:					
VFIRE21	154.2800 N	156.7	154.2800 N	156.7	Command / Control
VFIRE22	154.2650 N	156.7	154.2650 N	156.7	Tactical / Fire Ground
VFIRE23	154.2950 N	156.7	154.2950 N	156.7	Tactical / Fire Ground
VFIRE24	154.2725 N	156.7	154.2725 N	156.7	Tactical / Fire Ground
VFIRE25	154.2875 N	156.7	154.2875 N	156.7	TN Fire Mutual Aid
VFIRE26	154.3025 N	156.7	154.3025 N	156.7	Tactical / Fire Ground
VTNMA	154.7550 N	100.0 / 293	156.0150 N	100.0 / 293	Statewide Mutual Aid
VTNMAD	154.7550 N	100.0 / 293	154.7550 N	100.0 / 293	Direct for VTNMA
VTNTAC	159.7050 N	156.7 / 293	159.7050 N	156.7 / 293	TN TAC Channel

VHF EMS Minimum Required Channels

Channel Name/Trunked Radio System Talkgroup	RX Freq N or W	RX Tone/NAC	TX Freq N or W	Tx Tone/NAC	Notes
VCALL10 / VTAC11-14 / VTAC33-38 FROM PAGE 19 PLUS CHANNELS BELOW:					
VEMS 205	155.2050 N	D205	155.2050 N	D205	EMS Mutual Aid
VEMS 295[1]	155.2950 N	D155	155.2950 N	D155	EMS Staging
VEMS 340[2]	155.3400 N	CSQ	155.3400 N	CSQ	Ambulance to Hospital
VMED28[2]	155.3400 N	CSQ	155.3400 N	CSQ	EMS Mutual Aid
VMED29	155.3475 N	CSQ	155.3475 N	CSQ	EMS Mutual Aid
VTNMA	154.7550 N	100.0 / 293	156.0150 N	100.0 / 293	Statewide Mutual Aid
VTNMAD	154.7550 N	100.0 / 293	154.7550 N	100.0 / 293	Direct for VTNMA
VTNTAC	159.7050 N	156.7 / 293	159.7050 N	156.7 / 293	TN TAC Channel

1 – Mobile Only Usage
2 – VEMS 340 is used within TN in accordance with the Tennessee EMS Telecommunications Plan. Requires hospital-specific DTMF encode for EMS units to communicate with desired hospital. VMED28 is for use outside Tennessee.

VHF Public Works / Utilities / Highway Maintenance Minimum Required Channels

Channel Name/Trunked Radio System Talkgroup	RX Freq N or W	RX Tone/NAC	TX Freq N or W	Tx Tone/NAC	Notes
VCALL10 / VTAC11-14 / VTAC33-38 FROM PAGE 19 PLUS CHANNELS BELOW:					
VTNMA	154.7550 N	100.0 / 293	156.0150 N	100.0 / 293	Statewide Mutual Aid
VTNMAD	154.7550 N	100.0 / 293	154.7550 N	100.0 / 293	Direct for VTNMA
VTNTAC	159.7050 N	156.7 / 293	159.7050 N	156.7 / 293	TN TAC Channel

UHF TN Minimum Required Channels

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
UCALL40	Multi-Disc.	453.2125 N	156.7 / 293	458.2125 N	156.7 / 293	A
UCALL40D	Multi-Disc.	453.2125 N	156.7 / 293	453.2125 N	156.7 / 293	A
UTAC41	Multi-Disc.	453.4625 N	156.7 / 293	458.4625 N	156.7 / 293	A, D
UTAC41D	Multi-Disc.	453.4625 N	156.7 / 293	453.4625 N	156.7 / 293	A, D
UTAC42	Multi-Disc.	453.7125 N	156.7 / 293	458.7215 N	156.7 / 293	A, D
UTAC42D	Multi-Disc.	453.7125 N	156.7 / 293	453.7215 N	156.7 / 293	A, D
UTAC43	Multi-Disc.	453.8625 N	156.7 / 293	458.8625 N	156.7 / 293	A, D
UTAC43D	Multi-Disc.	453.8625 N	156.7 / 293	453.8625 N	156.7 / 293	A, D
UTNTAC44	Law Enf.	460.3875 N	156.7 / 293	465.3875 N	156.7 / 293	A, D
UTNTAC44D	Law Enf.	460.3875 N	156.7 / 293	460.3875 N	156.7 / 293	A, D
UTNTAC45	Law Enf.	460.4125 N	156.7 / 293	465.4125 N	156.7 / 293	A, D
UTNTAC45D	Law Enf.	460.4125 N	156.7 / 293	460.4125 N	156.7 / 293	A, D
UTNMA	Multi-Disc.	460.4000 N	127.3 / 293	465.4000 N	127.3 / 293	A, D
UTNMAD	Multi-Disc.	460.4000 N	127.3 / 293	460.4000 N	127.3 / 293	A, D
UEMSTAC	EMS	463.1875 N	156.7 / 293	468.1875 N	156.7 / 293	A, D
UEMSTACD	EMS	463.1875 N	156.7 / 293	463.1875 N	156.7 / 293	A, D

NOTES

Direct or talkaround operation on UCALL40, UTAC41-43, UTNTAC44-45 indicated by adding "D" to the end of the above channel names. For direct operation, program radios to transmit **and** receive on the mobile receive frequency above.

UHF Law Enforcement / Corrections Minimum Required Channels

Channel Name/Trunked Radio System Talkgroup	RX Freq N or W	RX Tone/NAC	TX Freq N or W	Tx Tone/NAC	Notes
UCALL40 / UTAC41-43 FROM PAGE 24 PLUS CHANNELS BELOW:					
UTNTAC44	460.3875 N	156.7	465.3875 N	156.7	Tactical
UTNTAC44D	460.3875 N	156.7	460.3875 N	156.7	Direct
UTNTAC45	460.4125 N	156.7	465.4125 N	156.7	Tactical
UTNTAC45D	460.4125 N	156.7	460.4125 N	156.7	Direct
UTNMA	460.4000 N	127.3	465.4000 N	127.3	Statewide Mutual Aid
UTNMAD	460.4000 N	127.3	460.4000 N	127.3	Direct

UHF Fire / EMA / First Responder Minimum Required Channels

Channel Name/Trunked Radio System Talkgroup	RX Freq N or W	RX Tone/NAC	TX Freq N or W	Tx Tone/NAC	Notes
UCALL40 / UTAC41-43 FROM PAGE 24 PLUS CHANNELS BELOW:					
UEMSTAC	463.1875 N	156.7	468.1875 N	156.7	EMS Primary
UEMSTACD	463.1875 N	127.3	463.1875 N	127.3	Direct
UTNMA	460.4000 N	127.3	465.4000 N	127.3	Statewide Mutual Aid
UTNMAD	460.4000 N	127.3	460.4000 N	127.3	Direct

UHF EMS Minimum Required Channels

Channel Name/Trunked Radio System Talkgroup	RX Freq N or W	RX Tone/NAC	TX Freq N or W	Tx Tone/NAC	Notes
UCALL40 / UTAC41-43 FROM PAGE 24 PLUS CHANNELS BELOW:					
UEMSTAC	463.1875 N	156.7	468.1875 N	156.7	EMS Primary
UEMSTACD	463.1875 N	127.3	463.1875 N	127.3	Direct
UTNMA	460.4000 N	127.3	465.4000 N	127.3	Statewide Mutual Aid
UTNMAD	460.4000 N	127.3	460.4000 N	127.3	Direct
MED TALK	463.1625 N	156.7	468.1625 N	192.8	HSD 5

NOTES

Note: EMS units that transport to hospitals are encouraged to obtain an FCC license for usage of the UHF MED channels. MED TALK is unique to Homeland Security District 5.

800 MHz TN Minimum Required Channels

Channel Name/Trunked Radio System Talkgroup	Assignment	RX Freq	RX Tone/NAC	TX Freq	Tx Tone/NAC	Mode A, D or M
8CALL90	Multi-Disc.	851.01250	156.7	806.01250	156.7	A
8CALL90D	Multi-Disc.	851.01250	156.7	851.01250	156.7	A
8TAC91	Multi-Disc.	851.51250	156.7 / 293	806.51250	156.7 / 293	A, D
8TAC91D	Multi-Disc.	851.51250	156.7 / 293	851.51250	156.7 / 293	A, D
8TAC92	Multi-Disc.	852.01250	156.7 / 293	807.01250	156.7 / 293	A, D
8TAC92D	Multi-Disc.	852.01250	156.7 / 293	852.01250	156.7 / 293	A, D
8TAC93	Multi-Disc.	852.51250	156.7 / 293	807.51250	156.7 / 293	A, D
8TAC93D	Multi-Disc.	852.51250	156.7 / 293	852.51250	156.7 / 293	A, D
8TAC94	Multi-Disc.	853.01250	156.7 / 293	808.01250	156.7 / 293	A, D
8TAC94D	Multi-Disc.	853.01250	156.7 / 293	853.01250	156.7 / 293	A, D
8TNMA	Multi-Disc.	854.18750	156.7	809.18750	156.7	A
8TNMAD	Multi-Disc.	854.18750	156.7	854.18750	156.7	A
8TNTAC	Multi-Disc.	854.48750	156.7	809.48750	156.7	A
8TNTACD	Multi-Disc.	854.48750	156.7	854.48750	156.7	A

NOTES

Direct or talkaround operation on 8CALL90, 8TAC91-94, 8TNMA indicated by adding "D" to the end of the above channel names. For direct operation, program radios to transmit **and** receive on the mobile receive frequency above.

Operation SECURE HF 2 - 30 MHz Frequency List

Carrier MHz	Assigned MHz	Power Limit PEP W	Emission	Class of Station	Usage
2.3260	2.32740	1 KW	2.8J3E	FB, FX, ML	Day & night, interstate coordination only
2.4190	2.42040	1 KW	2.8J3E	FB, FX, ML	Day & night
2.4740	2.47540	1 KW	2.8J3E	FB, FX, ML	Day & night
5.1350	5.13640	1 KW	2.8J3E	FX	Day & night, alternate
5.1400	5.14140	1 KW	2.8J3E	FX	Day & night, alternate, interstate coordination only
5.1950	5.19640	1 KW	2.8J3E	FX	Day & night, interstate coordination only
7.4800	7.48140	1 KW	2.8J3E	FX	Day & night, alternate
7.8050	7.80640	1 KW	2.8J3E	FX	Day & night, interstate coordination only
7.9320	7.93340	1 KW	2.8J3E	FX	Day & night

NOTES

The State of Tennessee Operation SECURE Plan governs the use of these HF State assigned frequencies. It is also recognized that the FEMA, SHARES, Military (MARS), Amateur Radio, and other HF channels may be used as deemed necessary during disasters. WINLINK capability is especially desired. See www.winlink.org.

To operate on OPERATION SECURE State licensed channels, the local EMA must sign a separate Frequency Usage Agreement with TEMA. FCC type accepted radio equipment must be used and equipment with Automatic Link Establishment is not required. Government equipment may be used on Amateur Radio (Ham) frequencies if it is operated by a licensed Amateur Radio Operator.

Amateur Radio Frequency List

Please note: Amateur Radio frequencies are not licensed or assigned like public safety. HF frequencies (1.8 – 30 MHz) are not assigned specific channels. The listed frequencies are simply suggested in case frequencies for the emergency / exercise are not known. The primary "rallying" frequency for TN is 3.980 MHz since it is the TN Phone Net frequency and at other times is used primarily by TN stations for normal amateur radio use. If that frequency is not the one being used for the emergency / exercise, someone on that frequency will likely know the event frequencies.

Operating on Amateur Radio frequencies requires an authorized and licensed Amateur Radio Operator. Refer to the Amateur Radio Band Plan and Repeater Directory published by the American Radio Relay League (ARRL) for more detailed frequency information.

Band	RX Freq	RX Tone	TX Freq	Tx Tone	Notes
80m	3.980		3.980		TN / ARES Phone Net
40m	7.238		7.238		ALT. TN / ARES Phone Net
2m	146.5200	CSQ	146.5200	CSQ	National Simplex Calling
2m	146.5800	CSQ or 100.0	146.5800	CSQ or 100.0	TN Simplex Calling
70cm	446.0000	CSQ or 100.0	446.0000	CSQ or 100.0	National Simplex Frequency
Note: 146.5800 and 446.0000 may be linked.					
70cm	MTEARS linked repeater system. See map at www.mtears.org.				
WINLINK	Various frequencies throughout spectrum. See www.winlink.org.				
ANY	As needed based on local use and propagation.				

Radio System Information

DTMF Encode/Decode Listing by County

County# / Name	InterCity Warning Point	TMAC	County# / Name	InterCity Warning Point	TMAC
01-Anderson	0101	97	**18-Cumberland**	1801	18
02-Bedford	0201	02	**19-Davidson**	1901	19, 74, 79, 98
03-Benton	0301	03	**20-DeKalb**	2001	
04-Bledsoe	0401	04	**21-Decatur**	2101	
05-Blount	0501		**22-Dickson**	2201	25
06-Bradley	0601		**23-Dyer**	2301	23
07-Campbell	0701	07	**24-Fayette**	2401	24
08-Cannon	0801	08	**25-Fentress**	2501	
09-Carroll	0901		**26-Franklin**	2601	26, 31
10-Carter	1001	10	**27-Gibson**	2701	27
11-Cheatham	1101		**28-Giles**	2801	28
12-Chester	1201		**29-Grainger**	2901	
13-Claiborne	1301	13	**30-Greene**	3001	30
14-Clay	1401		**31-Grundy**	3101	
15-Cocke	1501	15	**32-Hamblen**	3201	
16-Coffee	1601	16	**33-Hamilton**	3301	96
17-Crockett	1701		**34-Hancock**	3401	

Note: InterCity DTMF code for counties will always be the County Number followed by “01”

DTMF Encode/Decode Listing by County

County# / Name	InterCity Warning Point	TMAC	County# / Name	InterCity Warning Point	TMAC
35-Hardeman	3501	35	**52-Lincoln**	5201	52
36-Hardin	3601	36	**53-Loudon**	5301	
37-Hawkins	3701	37	**54-McMinn**	5401	54
38-Haywood	3801	38	**55-McNairy**	5501	87
39-Henderson	3901	39	**56-Macon**	5601	56
40-Henry	4001	40	**57-Madison**	5701	57
41-Hickman	4101	41	**58-Marion**	5801	58
42-Houston	4201		**59-Marshall**	5901	59
43-Humphreys	4301	43	**60-Maury**	6001	60
44-Jackson	4401		**61-Meigs**	6101	61
45-Jefferson	4501		**62-Monroe**	6201	
46-Johnson	4601	46	**63-Montgomery**	6301	63
47-Knox	4701	47	**64-Moore**	6401	64
48-Lake	4801		**65-Morgan**	6501	65
49-Lauderdale	4901	49	**66-Obion**	6601	48
50-Lawrence	5001	50	**67-Overton**	6701	14, 67
51-Lewis	5101		**68-Perry**	6801	68

DTMF Encode/Decode Listing by County

County# / Name	InterCity Warning Point	TMAC	County# / Name	InterCity Warning Point	TMAC
69-Pickett	6901		**86-Unicoi**	8601	
70-Polk	7001	70, 84	**87-Union**	8701	
71-Putnam	7101	71	**88-Van Buren**	8801	
72-Rhea	7201	72	**89-Warren**	8901	89
73-Roane	7301	73	**90-Washington**	9001	
74-Robertson	7401		**91-Wayne**	9101	91
75-Rutherford	7501	75	**92-Weakley**	9201	92
76-Scott	7601	24	**93-White**	9301	
77-Sequatchie	7701	89	**94-Williamson**	9401	94
78-Sevier	7801	05, 78	**95-Wilson**	9501	95
79-Shelby	7901	79, 84	**96-RESERVED**	9601	
80-Smith	8001	85	**97-RESERVED**	9701	
81-Stewart	8101	81	**98-RESERVED**	9801	
82-Sullivan	8201	82	**99-All Calls**	9901	
83-Sumner	8301	83			
84-Tipton	8401				
85-Trousdale	8501				

DTMF Encode/Decode Listing by County

County	Co.#	InterCity Warning Point	County	Co.#	InterCity Warning Point
HSD1 ALL CALL		9901	**THP KNOX**	47	4750
HSD2 ALL CALL		9902	**THP CHAT**	33	3350
HSD3 ALL CALL		9903	**THP NASH**	19	1950
HSD4 ALL CALL		9904	**THP MEMPH**	79	7950
HSD5 ALL CALL		9905	**THP FALL B**	90	9050
HSD6 ALL CALL		9906	**THP COOK**	71	7150
HSD7 ALL CALL		9907	**THP LAWR**	50	5050
HSD8 ALL CALL		9908	**THP JACK**	57	5750
HSD9 ALL CALL		9909			
HSD10 ALL CALL		9910			
HSD11 ALL CALL		9911			
TEMA SEOC	19	1960			
TEMA EAST ALCOA	47	4760			
TEMA WEST JACKSON	57	5760			

Communications Assets and Resources

Communications Assets Survey and Mapping Tool (CASM)

The Administrative Manager for CASM in Tennessee is:

Louis Friedmann, Statewide Interoperability Coordinator
TEMA Director of Operations and Communications
Office: 615-741-0985
Operations: 615-741-0001
E-mail: lfriedmann@tnema.org

For assistance with using CASM, or for help with CASM account access, contact Louis Friedmann.

Gateways

Gateway / Cross-Band Device Operation

Gateways interconnect channels of different systems (whether on different bands, channels, or modes), allowing first responders to use their existing radios and channels to communicate with users outside their agency or radio system. Use of designated interoperability channels is preferred over the use of any agency's primary operational channels or talkgroups.

A Communications Unit Leader (COML) or Incident Commander (IC) must be aware that multiple gateway activations in support of an incident can result in interference. Interference issues are best resolved by the technical support personnel assigned to the gateways.

Fixed Site Gateway Rules of Use

The IC or designee will determine when a situation exists that requires use of a regional interoperability resource, and will notify the appropriate dispatch center. The dispatch center will follow established procedures for relaying the request. Fixed gateway deployments will be permitted under the following conditions:

1. Agencies owning or operating a gateway device (fixed or transportable) must obtain a "Frequency Use Agreement" (required by FCC Rule 90.421) in order to connect with radio channels licensed by other agencies (other than the approved interoperability frequencies listed in Tables 1-4 of the Tennessee Radio Interoperability Guide). It is strongly recommended to utilize designated interoperability or mutual aid channels for gateway connections as opposed to primary agency dispatch channels.
2. Prior to gateway activation, the agenc(ies) that will be bridged together will be notified that a patch is about to occur.
3. Radio users will identify themselves by agency name followed by their call/sign or radio designator. (Example: Nashville PD 121)
4. If interference occurs and an agency requests that their channel be removed from the patch, the gateway operator will do so immediately.
5. During operation of the gateway, personnel will maintain continuous control over the device so interference can be quickly mitigated.
6. All interoperability devices will be registered with the TEMA Statewide Radio Interoperability Coordinator.
7. Any agency purchasing an interoperability device must have personnel trained in the operation and deployment of the unit.
8. Each local Mobile Command/Communications vehicle should have the minimum capability to establish cross-band talkgroups (VHF, UHF, 800, and 700 when available) for

a “Calling Channel”, one “TAC Channel” for Command and Control, and one “TAC Channel” for on-scene operations.
9. If the situation necessitates additional communications resources, a Mobile Communications Vehicle will be requested and additional cross-band TAC Channels established.
10. All radio traffic should be in plain language using common terminology.
11. When patched through a gateway, all encrypted radio users will be required to work in the “clear” mode unless otherwise arranged in advance.
12. Dispatch supervisors will ensure that each activated interoperability channel is monitored as needed.
13. **SAFETY MESSAGE:** All users should be aware that the Emergency Alert button may not function properly when patched through a gateway device.

Fixed Site Gateway Request

Radio users requiring direct communications with a user from a different agency shall follow their agency’s established procedures for requesting connectivity. Typically, a user should request connectivity through their agency’s dispatch center.

The following information is provided by the requesting agency at the time of an activation request:
1. Requesting user’s agency.
2. On-scene agencies requiring interoperability.
3. Reason for request/type of event.
4. Equipment required.
5. Expected duration of event.
6. Requestor’s or dispatch center contact phone number.

Fixed Site Gateway Activation

Once authorization has been granted, all users should follow their internal agency procedures for activating the connectivity.

Procedures for establishing communications connectivity include:
1. Selection of a channel or talkgroup on the agency’s home system if necessary.
2. Verifying system-wide availability of required resources, coordination among control point dispatchers.
3. Providing radio call sign/designator information to connected agencies as needed.
4. Assigning the requested unit(s)/agenc(ies) to that channel or talkgroup.
5. The control point dispatcher will connect the agency to the appropriate channel/talkgroup.
6. Announce to users that a patch has been activated between ___ and ___.

7. Users should identify themselves on the interoperability channel using their agency name and unit identifier. (Example: Nashville PD 515A1)
8. The dispatcher for the jurisdiction where the event is being worked shall monitor the interoperability channel to address requests as needed unless this responsibility has been delegated.

Fixed Site Gateway Deactivation

When the interoperable communications connection is no longer required, agencies should follow these deactivation procedures:

1. The requesting agency/user or IC where the event occurred shall contact their dispatch center so the patch can be disconnected.
2. The dispatcher shall make an announcement on the interoperable channel/talkgroup, confirming there are no users still requiring the patch, and indicating that the connection will be terminated.
3. All personnel shall return to their home system channel assignments.

Fixed Site Gateway Problem Recognition and Resolution

During and/or following an incident or event:

1. During utilization, problems with gateways should be reported to the dispatch center/COML/COMT/THSP, which will follow established agency procedures to resolve the problem.
2. Agencies may report problems with the gateway to the appropriate point of contact for the incident, event, training, or exercise. The POC will be responsible for ensuring effective resolution to problems with the gateway or for notification of the appropriate responsible agency.

Fixed Site Gateway Limitations

Interoperability provided through a gateway has the ability to link participating agencies, but has the following limitations:

1. The number of simultaneous patches that can be supported by the gateway will be limited by gateway configuration.
2. Home system coverage may limit communications, users must be within the footprint of the coverage area of the desired system.
3. The Radio Emergency Alert button ("Metro 5000") may not function properly when patched through a gateway device.

Fixed Site Gateway Testing

To ensure that equipment components of the interoperability solution are operating properly, each agency should participate in regular testing as established by agreement.

Mobile Gateways

This section provides guidance on how to request, deploy, and use mobile gateways during emergency response. The Incident Commander or designee will determine when a situation exists that requires use of a regional interoperability resource and notify the appropriate dispatch center. The dispatch center will follow internal agency procedures to contact the Mobile Gateway Agency POC and relay pertinent information regarding the event, including activation of the technical support team. The Communications Unit Leader/Incident Commander must be aware that multiple gateway activations in support of an incident can result in interference. Interference issues are best resolved by the technical support team assigned to the gateways.

Mobile Gateway Rules of Use

The following rules of use shall govern interoperable communications between agencies:

1. Prior to activation involving an outside agency, permission must be obtained by "Frequency Use Agreement" as required by FCC Rule 90.421.
2. Prior to activation, agencies being patched together will be notified.
3. Agencies will identify themselves by agency name and designated call sign / radio designator.
4. All radio traffic should be in plain language using common terminology.
5. If interference occurs and an agency requests that their channel be removed from the patch, the gateway operator will do so immediately.
6. During operation of the gateway, personnel will maintain continuous control over the device so interference can be quickly mitigated.
7. When patched through a gateway, encrypted users will be required to work in the "clear" mode unless otherwise arranged in advance.
8. The Incident Commander or designee will ensure that each activated interoperability channel is monitored as needed.
9. If interference occurs, an agency may request to be removed from the "patch" or to have the "patch" deactivated.
10. NOTE: The Radio Emergency Alert button ("Metro 5000") may not function properly when patched through a gateway device.

Mobile Gateway Request

The following information is provided by the requesting agency to the Mobile Gateway Agency POC at the time of an activation request:

1. User's agency.
2. On-scene agencies requiring interoperability.
3. Reason for request/type of event.
4. Equipment required.
5. Expended duration of event.
6. Location required/access information.
7. Incident point of contact.
8. User/requestor and/or servicing dispatch center contact phone number.
9. The Mobile Gateway Agency coordinates the deployment by providing the contact information for the gateway to the Incident Commander or designee.

Mobile Gateway Activation

Mobile gateways may or may not be outfitted with agency radios before the event. Therefore, agencies may be required to bring a portable radio, connector cable, and charger to connect to the mobile gateway for the length of the operation.

The Mobile Gateway Agency POC will provide an estimated response or activation time which will be relayed to the dispatch center of the agency having jurisdiction over the event. The dispatch center will relay the information to the Incident Commander.

The Mobile Gateway and a technician, operator, or other trained personnel will be sent to the incident scene. That operator will be responsible for supporting the gateway.

The Communications Unit Leader (COML) should follow these procedures:

1. Require participating agencies to check in at the command post or other designated location and provide frequency/talkgroup channels available for use during the incident.
2. Require agencies not pre-configured within a mobile gateway to provide a preprogrammed radio, connector cable, and charger.
3. Confirm or assign radio call sign/designator information to connected agencies.
4. Instruct the Mobile Gateway Operator where to set up and operate the gateway.
5. Inform the Mobile Gateway Operator what agencies are participating.
6. Confer with the Mobile Gateway Operator concerning what command level or other specific talkgroups that need to be programmed into or patched through the gateway.

The Mobile Gateway Operator should follow these procedures:

1. Obtain agency radios and connect to the mobile gateway with the appropriate cables.
2. Select the channel or talkgroup assigned by the agency.
3. Assign the requested unit/agency to that channel or talkgroup as designated by the Incident Commander.

Mobile Gateway Deployment Procedures

Upon receiving a request for the deployment of a mobile gateway, the below guidelines should be followed:

Dispatch Center:

1. Contact the on-call Mobile Gateway Operator/Technician responsible for deployment of the mobile gateway.
2. Dispatch the Mobile Gateway Operator/Technician to the incident scene.
3. Inform the requesting user that the mobile gateway has been dispatched.

Mobile Gateway Operator/Technician:

1. Respond to dispatcher with estimated time to retrieve mobile gateway and arrive on the incident scene.
2. Transport the mobile gateway to the scene.
3. Report to the Incident Commander on arrival.

Mobile Gateway Deactivation

When the use of the mobile gateway is no longer required, agencies should follow these guidelines. Participating agencies are responsible for retrieving the portable radio provided during the operation.

Communications Unit Leader (COML):

1. Make an announcement on the command channel/net to all command personnel advising that the mobile gateway is going to be deactivated at a designated time.
2. Make an announcement on the patched tactical nets/channels/talkgroups, confirming there are no users still requiring the patch, and indicating that the connection will be terminated.
3. Contact the Mobile Gateway Operator/Technician with instructions on shutting down the mobile gateway.

Mobile Gateway Operator/Technician:

1. Ensure agencies retrieve portable radios.
2. Take inventory of equipment and note any missing, needing repair, or replacement.
3. Return to pre-response location and make mobile gateway ready for service.

Mobile Gateway Problem Recognition and Resolution

During an incident:
Problems should be reported to the Communications Unit Leader or to the operator/technician deployed with the gateway.

Following an incident or during post-incident debriefing:
Agencies using the mobile gateway may report any problems to the appropriate POC with the agency owning or operating the gateway.

Mobile Gateway Limitations

Interoperability provided through a mobile gateway has the ability to link participating agencies, but has the following limitations:

1. Deployment time for a mobile gateway is typically one (1) hour plus response time to the incident scene.
2. System coverage may limit communications.
3. To facilitate a faster deployment and activation, interoperability connectivity should be planned in advance. Interoperability established through gateway patches can be established quickly if agencies have provided a donor radio or have made arrangements with the Gateway POC in advance of the deployment.
4. The number of simultaneous patches that can be supported by the gateway are limited by the gateway configuration.
5. The Radio Emergency Alert Button ("Metro 5000") may not function properly when patched through a gateway device.

Mobile Gateway Testing

To ensure that equipment components of the interoperability solution are operating properly, each agency will participate in the following testing procedures:

1. Representatives from each agency should meet on a regular basis to test the interoperability solution.
2. Testing should include deployment, setup, operation, and deactivation of the mobile gateway. Agency representatives should arrive at the test location to assess their ability to communicate with other agencies utilizing the mobile gateway.
3. If an issue or problem is identified during the testing procedure, personnel shall determine who will be responsible for taking corrective action. If the issue or problem cannot be identified, personnel shall contact the appropriate technical personnel.

Satellite Interoperability

Interoperable Push-to-Talk (PTT) groups have been established for users with Mobile Satellite (MSAT) capability.

Satellite Mutual Aid Radio Talkgroups (SMART) that cover Tennessee include:

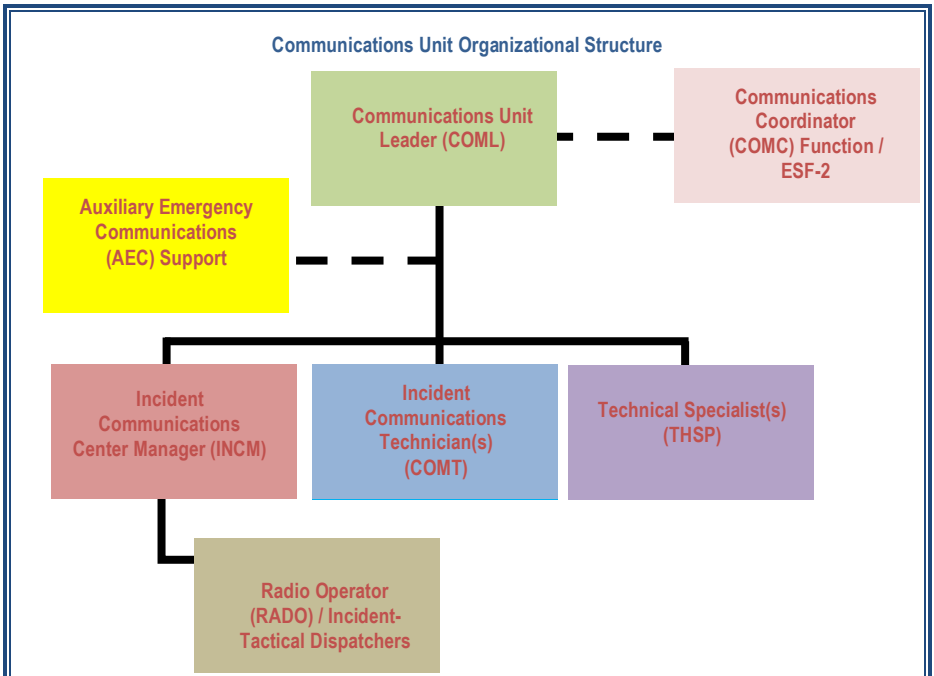
Tennessee 1 Talkgroup: This talkgroup is open to all Public Safety agencies in Tennessee for Command and Control, on-scene coordination, planned events, coordination with the SEOC, and other dispatch centers that monitor this group. The Net Control will be the State EOC which will also have the responsibility to monitor this talkgroup on a 24/7 basis. Requests to join this talkgroup will be sent to the TEMA Director of Operations and Communications.

CUSEC-1 Central United States Earthquake Consortium Talkgroup: This talkgroup is open to all entities that are in the CUSEC partner states. The Net Control and manager of this talkgroup is the State of Indiana. Requests to join this talkgroup should be sent to CUSEC-1@cusec.org.

SE-SMART Talkgroup: Membership for this talkgroup consists of the southeast states (AR, AL, FL, GA, KY, LA, MS, NC, SC, TN, VA, and WV). The Net Control and manager of this talkgroup is Fairfax County, VA OEM/Public Safety Communications. Requests to join this talkgroup should be sent to SESMART@fairfaxcounty.gov.

F-SMART Talkgroup (Fire SMART): F-SMART is for government and public safety agencies involved in fire services. The manager for F-SMART is the Charlottesville, VA Fire Department. Requests to join this talkgroup should be sent to FSMART@charlottesville.org.

J-SMART Talkgroup (Justice SMART): J-SMART is for Public Safety agencies, but more focused on the law enforcement community. The manager for J-SMART is the Department of Justice. Requests to join this talkgroup should be sent to SMART@usdoj.gov.


Communications Unit Organizational Structure
Communications Unit Leader (COML)
Communications Coordinator (COMC) Function / ESF-2
Auxiliary Emergency Communications (AEC) Support
Incident Communications Center Manager (INCM)
Incident Communications Technician(s) (COMT)
Technical Specialist(s) (THSP)
Radio Operator (RADO) / Incident-Tactical Dispatchers

Communications Unit Position Descriptions

COMMUNICATIONS UNIT LEADER (COML):

1. Plans and manages the technical and operational functions of the Communications Unit during an incident or event.
2. Supervises the Communications Unit. Manages Communications Unit personnel (INCM, RADO, COMT, THSP).
3. Participates in incident action planning.
4. Prepares the Incident Radio Communications Plan (ICS Form 205).

INCIDENT COMMUNICATIONS CENTER MANAGER (INCM):

1. Establishes and manages an Incident Communications Center (ICC).
2. Supervises RADO positions.
3. Assists the COML.

RADIO OPERATOR (RADO):

1. Staff positions in the ICC.
2. Also referred to as “Incident Dispatchers” or “Tactical Dispatchers.”
3. Receive specialized training to operate in an incident-based environment.
4. Includes Telecommunicator Emergency Response Taskforce (TERT) resources.

INCIDENT COMMUNICATIONS TECHNICIAN (COMT):

1. Responsible for supporting the technical functions of the Communications Unit.
2. Install, test, troubleshoot communications systems.
3. Identify requirements for radio system coverage.
4. Support battery needs.
5. Resolve interference issues.
6. Program radios.
7. Maintain/repair equipment.

TECHNICAL SPECIALIST (THSP):

1. Possesses expertise in specific types of communications technology.
2. Gateways, radio caches, telephone, data, mobile communications assets, GIS.

COMMUNICATIONS COORDINATOR (COMC):

1. Provides support to the Communications Unit and COML. Not technically a part of the Communications Unit.
2. Responsibilities frequently performed by ESF-2 representative or Public Safety Communications Center supervisor. May operate at the local, regional, state, or federal levels.
3. Performs frequency coordination responsibilities within a region or a state during an incident or event.
4. Reviews Incident Radio Communications Plans to ensure communications channels/talkgroups are allocated and used effectively. Works with the COML to assign channel / talkgroup resources in support of the Incident Radio Communications Plan.
5. Coordinates among multiple incident sites, dispatch centers, incident command personnel, etc., to prevent or resolve interference issues.

Communications Unit Leader (COML) Position Checklist

COML MOBILIZATION QUESTIONS

1. POC and contact info?
2. Mission number?
3. Type of event?
4. Reporting location?
5. Reporting date and time?
6. Mode of transportation?
7. Route?
8. Length of operations?
9. Safety issues?

TASK

1. Obtain briefing from the Logistics Section Chief or designated supervisor.
2. Organize and staff Communications Unit as appropriate
   a. Assign Incident Communications Center Manager (INCM) and Lead Incident Dispatcher/Radio Operator (RADO).
   b. Assign Message Center Manager and ensure adequate staff is assigned to answer phones and attend to fax machines.
3. Assess communications systems/frequencies in use; advise on communications capabilities/limitations.
4. Develop and implement effective communications procedures (flow) internal and external to the incident/Incident Command Post.
5. Assess Incident Command Post phone load and request additional lines as needed.
6. Obtain copy of Communications Resource Availability Worksheet (ICS Form 217A) which provides RF information for the applicable area. If ICS Form 217A has not been completed or is unavailable, it should be prepared.

7. Prepare and implement Incident Radio Communications Plan (ICS Form 205):
    a. Obtain current organizational chart.
    b. Determine most hazardous tactical activity; ensure adequate communications.
    c. Make communications assignments to all other Operations elements, including volunteer, contract, or mutual aid.
    d. Determine Command communications needs.
    e. Establish and post any specific procedures for use of Incident Command Post communications equipment.
8. Include telephone number assignments (landline, cellular, fax, pagers, etc.) in Incident Communications Plan (ICS Form 205T) if appropriate:
    a. Determine specific organizational elements to be assigned telephones.
    b. Identify all facilities/locations with which communications must be established (shelters, press area, liaison area, agency facilities, other governmental entities' Emergency Operations Center [EOCs], etc.), and identify and document phone numbers.
    c. Determine which phones and what numbers should be used by specific personnel and their purpose. Assign specific telephone numbers for incoming calls, and report these numbers to staff and off-site parties such as other local jurisdictions, State and Federal agencies.
    d. Do not publicize OUTGOING call lines.
9. Activate, serve as contact point, and supervise the integration of Auxiliary Emergency Communications support into the communications system.
10. Ensure radio and telephone logs are available and being used.

11. Determine need and research availability of additional nets and systems:
    a. Order through Supply Unit after approval by supervisor
    b. Federal systems:
        i. Additional radios and other communications devices, including repeaters, radio-telephone interconnects and satellite down-link capabilities may be available through FEMA or the USDA's Forest Service.
12. Document malfunctioning communications equipment, facilitate repair.
13. Establish and maintain communications equipment accountability system.
14. As required, provide technical information regarding:
    a. Adequacy of communications system currently in use
    b. Geographic limitations of communications equipment
    c. Equipment capabilities
    d. Amount and types of equipment available
    e. Anticipated problems in the use of communications equipment
15. Estimate Communications Unit needs for expected operations
16. As required, request relief personnel
17. Brief relief personnel on current, significant activities.
18. Document significant events on Activity Log (ICS Form 214).

Procedural Reference Information

Concept of Operations - Requests for Communications Assets

1. An agency needing support of a Communications asset will contact their local dispatch center (local 9-1-1, THP District, TEMA Regional Office, etc.).
2. The local dispatch center will contact their County EMA and make the request.
3. If the County EMA is unable to fulfill the request, either mutual aid support from adjacent jurisdictions will be requested, or the request will be submitted to the State EOC (SEOC). The SEOC will open a mission and start official documentation of the incident.
3. The SEOC will contact the closest and most appropriate State or local asset that can support the request, determine the availability and estimated time of deployment. This will normally be routed through the local EMA.
4. The SEOC will then report the response information back to the requesting dispatch center.
5. The SEOC (TEMA Operations) will verify that the responding asset, the requesting jurisdiction dispatch center, and the on-scene commander all have a common mutual aid channel.
6. The responding asset will check with the Incident Commander (IC) for staging of the asset or to determine a reporting location.
7. The IC will designate a vehicle to meet the arriving Communications asset and escort them to the designated location.
8. The Communications asset will establish communications with the SEOC once on scene.
9. The IC will designate a Communications Unit Leader (COML) who will prepare an Incident Radio Communications Plan (ICS Form 205). The ICS205 will be provided to the Communications asset. The Communications Plan will also include phone numbers for incident personnel and other significant locations.
10. If necessary, the IC will designate law enforcement personnel to provide security at the site of the Communications asset.
11. The Communications asset will rapidly prepare to activate interoperable communications necessary to support on-scene incident personnel.
12. The Communications asset will have a cache of 800 MHz, VHF, and UHF portable radios to issue to incident personnel if necessary.
13. The Communications asset should be prepared to remain on scene staffed by trained communications personnel until released by the Incident Commander or designee.

District 2 Net

System Description:

District 2 Net is a talkgroup on the Knox County trunked radio system. This talkgroup is available to all counties within Tennessee Homeland Security District 2. District 2 Net is used for point-to-point communications between 9-1-1 centers. District 2 Net may be used for interagency communications during times of disaster, emergencies, or other urgent situations. There is a scheduled test of the District 2 Net each Sunday at 0800 hours. This net is **not** encrypted and may be monitored. Refer to Homeland Security District 2 SOP/SOGs for further details on the use of District 2 Net.

Use and Operation:

District 2 Net is used for emergency or urgent traffic between agencies. Plain language/common terminology is required when communicating on the District 2 Net. Examples of use include:

- Law enforcement needing/providing assistance from/to other agencies.
- Fire/EMS mutual aid requests.
- Pursuits crossing multiple jurisdictions.
- Law enforcement broadcasts (BOLOs) across multiple jurisdictions.
- High priority calls such as in-progress/just occurred felonies.
- Events occurring near jurisdictional boundaries or along major roadways, interstates, etc.
- Severe weather events, natural disasters, significant event operations.
- Urgent requests for EMA resources.
- Other emergencies or urgent EMS, Fire, Law Enforcement, EMA radio traffic.
- PSAP to PSAP communications during failures of the public telephone system.

LETS Talk System SOGs

This section contains key points from the LETS Talk SOGs. (Refer to the LETS Talk SOGs for further details.)

System Description:

LETS Talk is unique to Tennessee, utilizing the existing VHF and UHF mutual aid frequency pairs established under the old TLEPA and adding a 800 MHz frequency pair for conventional, analog radio communications. The system may be deployed in the cross-band, stand-alone, simulcast or inter-faced to the trunked Talk Group configuration. LETS Talk is an analog radio communications system/resource that may be deployed in the following modes:

1. Stand-alone V, U or 800 analog
2. Stand-alone V, U or 800 analog interfaced into a trunk talk group
3. Cross-band V/U; V/ 800; U/800; V/U/800 analog
4. Cross-band into a trunk talk group
5. Simulcast in any of the above configurations

The LETS Talk frequencies are:

1. VHF TN Mutual Aid (VTNMA): 154.7550 RX / 156.0150 TX
2. UHF TN Mutual Aid (UTNMA): 460.4000 RX / 465.4000 TX
3. 800 TN Mutual Aid (8TNMA): 854.18750 RX / 809.18750 TX

In order to mitigate interference and maximize usage, LETS Talk will have nine (9) CTCSS / DCS tones. The repeater output (mobile receive) tone will be consistent across the state however the repeater input (mobile transmit) will be different at each site. The tones are listed in the MOU.

The LETS Talk frequencies are only to be used within the state of Tennessee unless authorized by an agency's FCC license.

Nomenclature:

Tennessee has adopted the standard channel nomenclature format developed by the National Public Safety Telecommunications Council (NPSTC). LETS Talk channels will be programmed into radio equipment using the format contained below:

Channel Name	Mobile RX	RX Tone	Mobile TX	Tx Tone	A/D	Comments
VTNMA1	154.7550 N	100.0	156.0150 N	100.0	A	Narrowband 11K
UTNMA1	460.4000 N	127.3	465.4000N	127.3	A	Narrowband 11K
8TNMA1	854.1875 W	156.7	809.1875 W	156.7	A	Wideband 20K
VTNMA2	154.7550 N	100.0	156.0150 N	D251	A	Narrowband 11K
UTNMA2	460.4000 N	127.3	465.4000N	D251	A	Narrowband 11K
8TNMA2	854.1875 W	156.7	809.1875 W	D251	A	Wideband 20K
VTNMA3	154.7550 N	100.0	156.0150 N	D351	A	Narrowband 11K
UTNMA3	460.4000 N	127.3	465.4000N	D351	A	Narrowband 11K
8TNMA3	854.1875 W	156.7	809.1875 W	D351	A	Wideband 20K
VTNMA4	154.7550 N	100.0	156.0150 N	123.0	A	Narrowband 11K
UTNMA4	460.4000 N	127.3	465.4000N	123.0	A	Narrowband 11K
8TNMA4	854.1875 W	156.7	809.1875 W	123.0	A	Wideband 20K
VTNMA5	154.7550 N	100.0	156.0150 N	192.8	A	Narrowband 11K
UTNMA5	460.4000 N	127.3	465.4000N	192.8	A	Narrowband 11K
8TNMA5	854.1875 W	156.7	809.1875 W	192.8	A	Wideband 20K
VTNMA6	154.7550 N	100.0	156.0150 N	D631	A	Narrowband 11K
UTNMA6	460.4000 N	127.3	465.4000N	D631	A	Narrowband 11K
8TNMA6	854.1875 W	156.7	809.1875 W	D631	A	Wideband 20K
VTNMA7	154.7550 N	100.0	156.0150 N	D731	A	Narrowband 11K
UTNMA7	460.4000 N	127.3	465.4000N	D731	A	Narrowband 11K
8TNMA7	854.1875 W	156.7	809.1875 W	D731	A	Wideband 20K
VTNMA8	154.7550 N	100.0	156.0150 N	162.2	A	Narrowband 11K
UTNMA8	460.4000 N	127.3	465.4000N	162.2	A	Narrowband 11K
8TNMA8	854.1875 W	156.7	809.1875 W	162.2	A	Wideband 20K
VTNMA9	154.7550 N	100.0	156.0150 N	D051	A	Narrowband 11K
UTNMA9	460.4000 N	127.3	465.4000N	D051	A	Narrowband 11K
8TNMA9	854.1875 W	156.7	809.1875 W	D051	A	Wideband 20K

Radio Programming Example:

As shown in the table below, radios should have a dedicated zone for LETS Talk along with the National Interoperability Channels.

NOTE: Any LETS Talk channels should also be programmed with the Direct / Talkaround / Simplex mode.

CH#	VHF RADIO	UHF RADIO	800 MHZ RADIO
1	VTNMA1	UTNMA1	8TNMA1
2	VTNMA2	UTNMA2	8TNMA2
3	VTNMA3	UTNMA3	8TNMA3
4	VTNMA4	UTNMA4	8TNMA4
5	VTNMA5	UTNMA5	8TNMA5
6	VTNMA6	UTNMA6	8TNMA6
7	VTNMA7	UTNMA7	8TNMA7
8	VTNMA8	UTNMA8	8TNMA8
9	VTNMA9	UTNMA9	8TNMA9
10	VTNMAD	UTNMAD	8TNMAD
11	VCALL10	UCALL40	8CALL90
12	VTAC11	UTAC41	8TAC91
13	VTAC12	UTAC42	8TAC92
14	VTAC13	UTAC43	8TAC93
15	VTAC14	UEMSTAC	8TAC94

LETS Talk DTMF Repeater Enable / Disable Codes:

In order to enable or disable LETS Talk repeaters, transmit the DTMF codes for the desired repeaters using the format described below:

Repeater Enable Format: *XX01 XX = Two Digit County Number
Repeater Disable Format: *XX01#

Refer to the Tennessee Community on NIIX for a listing of LETS Talk frequencies and the most current version of the LETS Talk SOG. (*www.niix.org*)

MED Talk System

This section contains a description of the MED Talk system used in the counties around the metro Nashville area.

System Description:

MED Talk is a conventional UHF repeated system used for EMS communications. MED Talk is a shared simulcast system which covers five counties in the metro Nashville area (Davidson, Rutherford, Sumner, Williamson, Wilson) and uses the MED-72 channel with different CTCSS transmit tones depending on the desired communications coverage. There is one site located in each of the listed counties. The system uses the same microwave backhaul for site connectivity as the LETS Talk system.

MED Talk users must program the MED-72 channel into mobile and portable radios twice, using the channel names and CTCSS tones listed in the table below:

Channel	Receive	RX Tone	Transmit	TX Tone	Coverage
MED-72	463.1625	156.7	468.1625	156.7	Single County Only
MED TALK	463.1625	156.7	468.1625	192.8	Simulcast in all MED Talk Counties

To communicate on the MED Talk system across all five counties, users would select the MED Talk channel in their radio with the CTCSS transmit tone of 192.8. For in-county communications only, users should select the MED-72 channel in their radio with the CTCSS transmit tone of 156.7.

TMAC System SOGs

This section contains key points from the TMAC System SOGs. (Refer to the TMAC SOGs for further details.)

System Description:

The TMAC System is designed to serve as an 800 MHz conventional command and control network that operates between the State Emergency Operations Center (SEOC) and local, state, and federal entities as well as NGOs. TMAC is monitored on a 24/7 basis by the SEOC and at regional control points and is used on a regular basis for coordination during unplanned incidents and planned events.

TMAC is an 800 MHz conventional, analog radio communications that replaced the former low band, 45.360 MHz, interoperability system. TMAC consists of 11 different 800 MHz frequency pairs and incorporated the five National Public Safety Planning Advisory Committee (NPSPAC) interoperability channels, 8CALL90 and 8TAC91 through 8TAC94, and the Tennessee Mutual Aid Channels 8TNMA and 8TNTAC.

TMAC consists of a network of 800 MHz repeater sites throughout Tennessee. There are 11 repeater pairs, with one repeater pair assigned to each of the 11 regions listed below:

1. Bristol
2. Knoxville
3. Chattanooga
4. Crossville
5. Nashville
6. Lynchburg
7. Clarksville
8. Lawrence
9. Gibson
10. Jackson
11. Memphis

There are multiple repeaters in each of the above regions, and all counties in the same region utilize the same TMAC repeater frequencies.

TMAC also includes the five NPSPAC 800 MHz channels, 8CALL90 and 8TAC91-94.

TMAC is used by local, State, and federal agencies along with NGOs for the following:

1. Mutual aid and interoperability
2. Command/control communications
3. Coordination with TEMA
4. Requesting assistance, resources, or information
5. Receiving weather information
6. Training and exercises

Access to the eleven (11) TMAC repeater pairs requires specifically designated Dual-Tone Multi-Frequency (DTMF) tones which are provided to system users when access authorization is approved.

TMAC channels are monitored on a 24/7 basis at the State EOC and at various times by other control points throughout the regions.

TEMA's goal for TMAC is to provide access to each EOC, 24 hour dispatch point, mobile communications/command vehicle, County EMA, public safety agency, and other applicable entities involved in incident management.

The Tennessee Region 39 NPSPAC Plan as well as Federal Communications Commission CFR 47, Part 90 governs the usage of the NPSPAC interoperability channels. If any conflicts arise between these SOGs and the Region 39 Plan, the Region 39 Plan takes precedence.

Application Procedures:

Eligible entities wishing to access and utilize the TMAC system must complete a Frequency Use Agreement (see Appendix A) and submit it to the TEMA Director of Operations and Communications for review and approval. Requesting agencies must also provide TEMA with the manufacturer, model, and serial numbers of all radios to be used on the TMAC system, and the location of the unit (e.g., EOC, 911, EMA Director's vehicle, etc.).

Requesting agencies will receive a response from TEMA with the disposition of their request. Approved agencies will be provided with the following:

1. Signed copy of the Frequency Use Agreement
2. Block of MDC IDs
3. Frequency list for radio programming
4. Current system map
5. Listing of DTMF tones required for repeater access

Users receiving authorization from TEMA to utilize TMAC system must comply with all requirements contained in these SOGs, the Frequency Use Agreement, the TMAC Information Sheet, and the Tennessee Radio Interoperability Guide.

This application and Frequency Use Agreement process applies to mobile, portable, and control station operations only. Agencies desiring base station or repeater operation access must also apply for and receive the applicable FCC licensing in addition to the TEMA authorization described in this section.

DTMF Capability:

Radios used on the eleven TMAC repeater channels require DTMF microphones or DTMF encode capability in order to access the repeaters. DTMF access tones are assigned on a regional basis. A listing of DTMF access tones is provided to authorized system users. DTMF is not required for the 8 TNMA and 8 TNTAC channels.

Transmitting the assigned DTMF tone enables the desired repeater. Repeaters automatically go into repeat disable after approximately six (6) seconds of inactivity. It may be necessary to retransmit the DTMF tones again to enable the repeater if there has not been a transmission in more than six seconds.

MDC1200 IDs:

TEMA provides authorized TMAC users with a block of MDC1200 IDs for each radio they receive usage authorization. Each radio must be programmed with the assigned MDC1200 ID, and must also be configured to send the ID at the **END** of each transmission or Push-to-Talk (PTT).

The MDC1200 IDs represent a unique identification assigned to each radio used on the system. At the end of each transmission, the radios transmit the MDC1200 ID which displays at the control point, allowing the transmitting radio to be identified at the State EOC or other control points with MDC1200 decode capability.

Usage Authorization:

Usage of the TMAC system for emergency incidents or planned events is coordinated through TEMA. Planned event usage is coordinated in advance while unplanned emergency incident usage may be requested as needed during the course of managing the incident.

Unplanned or spontaneous usage of TMAC channels is requested by transmitting the assigned DTMF tone and contacting the State EOC. The requesting user will describe the usage request, including the type of incident, agencies involved, and the anticipated duration if possible. If any additional resources, assistance, or communications support is needed, it should be included as part of the notification.

TMAC channel assignments for emergency incidents and planned events shall be documented on the Incident Radio Communications Plan (ICS Form 205) by the Communications Unit Leader (COML) and disseminated appropriately as part of the Incident Action Plan or Incident Briefing Forms (ICS Form 201).

In order to mitigate interference or duplication, TEMA will serve as the Communications Coordinator (COMC) and will track the current status, assignment, and availability of TMAC resources.

Activation, Transfer of Control, Demobilization:

TMAC repeaters are activated or accessed using assigned DTMF tones which enable repeaters. Each TMAC repeater in the system requires a unique DTMF tone. Activation of TMAC repeaters for emergency incidents or planned events will occur following the process described in Section 6.1.

Resource utilization is coordinated by the Incident Management Team responsible for the incident or event. Communications resources are the responsibility of the COML and Communications Unit personnel.

Activation, transfer of control, and demobilization of communications resources will be handled in accordance with NIMS guidance as well as the process defined in the All-Hazards Type III COML training standards.

As resources are activated, reassigned, or demobilized, key elements become coordination, notifications, and communications between all stakeholders to ensure maximum efficiency of resource utilization.

Usage Instructions:

The TMAC system is very similar to radio systems used for normal day-to-day operations with one significant exception. The repeaters on the 11 TMAC channels must first be enabled by transmitting a DTMF tone.

The following steps should be followed to access the TMAC system:

1. Use the assigned DTMF tones associated with the repeater you are accessing to make the initial call to a TMAC monitoring point.
2. Key the radio microphone and transmit the assigned DTMF tones to enable the desired repeater. If more than six seconds pass between transmissions, and the repeater is allowed to drop, the DTMF tones must be transmitted again to re-enable the repeater.
3. Call the desired unit or control point using the hailing process described in Section 6.10 of these SOGs.
4. When acknowledged, broadcast the desired message.
5. When finished using the TMAC channel, the repeater will automatically go into repeat disable after six seconds of inactivity.
6. **Authorized** communications between field units that do not require the assistance or involvement of a control station may be done by using the assigned DTMF tones to enable the desired repeater. The involved units can initiate unit-to-unit communications as authorized.
7. If the use of a repeater is not necessary, it is also possible to select talk-around or direct mode on the desired TMAC channel and communicate unit to unit without using DTMF tones when all parties are within close proximity.
8. 8TNMA will be used in conjunction with UTNMA and VTNMA, and will be addressed in more detail in the LETS Talk SOGs.
9. 8TNTAC is primarily for usage as an on-scene tactical channel and will only be monitored by field command units or a dispatch center if requested and supported.

Nomenclature:

Tennessee has adopted the standard channel nomenclature format developed by the National Public Safety Telecommunications Council (NPSTC). TMAC channels will be programmed into radio equipment using the format contained below:

Eleven (11) TMAC Repeaters:

REGION	NAME	RADIO/CONSOLE LABEL
Bristol	BRISTOL TMAC	BRIST-T
Knoxville	KNOXVILLE TMAC	KNOXV-T
Chattanooga	CHATTANOOGA TMAC	CHATT-T
Crossville	CROSSVILLE TMAC	CROSS-T
Nashville	NASHVILLE TMAC	NASHV-T
Lynchburg	LYNCHBURG TMAC	LYNCH-T
Clarksville	CLARKSVILLE TMAC	CLARK-T
Lawrence	LAWRENCE TMAC	LAWRE-T
Gibson	GIBSON TMAC	GIBSO-T
Jackson	JACKSON TMAC	JACKS-T
Memphis	MEMPHIS TMAC	MEMPH-T

Problem Resolution:

TEMA is responsible for management and operation of the TMAC system. Problems with TMAC should be reported to the Communications Unit (COML or COMT) assigned to an incident or event if applicable, or to a member of TEMA's Communications Division.

If a problem surfaces while using TMAC for an incident or event, and the resource can no longer be utilized, the most effective alternate communications solution should be identified and assigned.

TVRCS SOGs

System Description:

Currently the State of Tennessee APCO 25 trunking system consists of two primary zones that share the same system. Zone One operating out of Nashville is operated by TDOC. Its coverage area consists of the Nashville area and various prison sites across the state. Zone Two operates out of Chattanooga by TVRCS and has a coverage area consisting of Northwest Georgia and a majority of East Tennessee.

TVRCS Interoperability:

Interoperability is accomplished by three means.

1. Mutual Aid:

This is accomplished by establishing mutual aid talk groups that are available in on-demand situations. These are discipline-specific talk groups with all subscribers in a specific discipline having the mutual aid talk groups for their region. These talk groups are used for quick mutual aid communications between multiple agencies.

Law Mutual Aid 1	THP District 2 & NWGA
Law Mutual Aid 2	THP District 2 & NWGA
Law Mutual Aid 3	THP District 2 & NWGA
Law Mutual Aid 4	THP District 1
Law Mutual Aid 5	THP District 1
Law Mutual Aid 6	THP District 1
Law Mutual Aid 7	THP District 5
Law Mutual Aid 8	THP District 5
Law Mutual Aid 9	THP District 5
Law Mutual Aid 10	THP District 6
Law Mutual Aid 11	THP District 6
Law Mutual Aid 12	THP District 6

Fire Mutual Aid 1	THP District 2 & NWGA
Fire Mutual Aid 2	THP District 2 & NWGA
Fire Mutual Aid 3	THP District 2 & NWGA
Fire Mutual Aid 4	THP District 1
Fire Mutual Aid 5	THP District 1
Fire Mutual Aid 6	THP District 1

EMS Mutual Aid 1	THP District 2 & NWGA
EMS Mutual Aid 2	THP District 2 & NWGA
EMS Mutual Aid 3	THP District 2 & NWGA
EMS Mutual Aid 4	THP District 1
EMS Mutual Aid 5	THP District 1
EMS Mutual Aid 6	THP District 1

All agencies in THP District 2 will have the Mutual Aid 1 – 3 for their specific discipline in their radios.

All agencies in THP District 1 will have the Mutual Aid 4 – 6 for their specific discipline in their radios.

All agencies in THP District 5 have the Mutual Aid 7 – 9 for their specific discipline in their radios.

All agencies in THP District 6 will have the Mutual Aid 10 – 12 for their specific discipline in their radios.

Note: See map of THP districts following this section.

2. Large Scale Events:

Large scale events that move beyond the day to day responses that involve multiple jurisdictions and agencies have available to them 16 more Interoperability talk groups. They are:

1 TN DIST 3	TN Homeland Security District 3
2 TN DIST 3	TN Homeland Security District 3
3 TN DIST 3	TN Homeland Security District 3
4 TN DIST 3	TN Homeland Security District 3
1 NWGA	Catoosa, Walker, Dade Counties GA
2 NWGA	Catoosa, Walker, Dade Counties GA
3 NWGA	Catoosa , Walker, Dade Counties GA
4 NWGA	Catoosa , Walker, Dade Counties GA
1TN DIST2	TN Homeland Security District 2
2 TN DIST 2	TN Homeland Security District 2
3 TN DIST 2	TN Homeland Security District 2
4 TN DIST 2	TN Homeland Security District 2
1 ZONE 1	TDOC / Middle Tennessee
2 ZONE 1	TDOC / Middle Tennessee
3 ZONE 1	TDOC / Middle Tennessee
4 ZONE 1	TDOC / Middle Tennessee

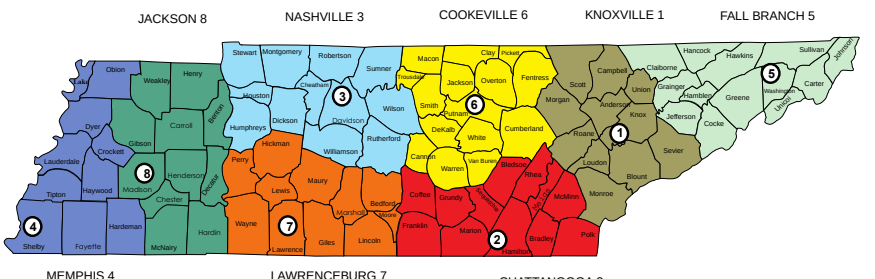
The talk groups are broken down by region just to give a starting point for an event. Should more than four talk groups be needed during the event, the other talk groups are available on an as needed basis if they are not already in use.

3. Outside of TVRCS:

Interoperability outside the coverage area of TVRCS would be on the National Interoperability frequencies and governed by the Statewide Communications Interoperability Plan (SCIP).

Map – THP Districts

Tennessee Highway Patrol District Map



Web Site Links

American Radio Relay League (ARRL): www.arrl.org
APCO International: www.apcointl.org
APCO TN: www.tnapco.org
CASM: https://casmtool.com
COML-COMT Yahoo Group: groups.yahoo.com/group/OEC-COML
DHS OEC: www.dhs.gov/xabout/structure/gc_1189774174005.shtm
EMAC: www.emacweb.org
FCC Enforcement Bureau: www.fcc.gov/eb
FCC Public Safety & Homeland Security Bureau: www.fcc.gov/pshs
FCC Special Temporary Authority (STA): www.fcc.gov/pshs/services/sta.html
FCC ULS: wireless.fcc.gov/uls
FEMA: www.fema.gov
Government Emergency Telecommunications Service (GETS): gets.ncs.gov
Homeland Security Information Network: www.hsin.gov
ICS Interactive Forms: www.fema.gov/pdf/emergency/nims/ics_forms_2010.pdf
Lessons Learned Information Sharing: www.llis.gov
MTEARS: www.mtears.org
National Interagency Fire Center (NIFC): www.nifc.gov
National Interagency Incident Communications: www.nifc.gov/niicd
National Interoperability Information Exchange (NIIX): www.niix.org
National Regional Planning Council (NRPC) www.nrpc.us
National Telecommunications & Information Admin (NTIA): http://www.ntia.doc.gov
National Weather Service: weather.gov
National Wildfire Coordinating Group (NWCG): www.nwcg.gov
Naval Oceanography Weather Portal: www.usno.navy.mil
NIMS Information: www.fema.gov/emergency/nims
NPSTC: www.npstc.org
OEC Public Safety Technical Assistance Tools: publicsafetytools.info
Radio Reference: www.radioreference.com
Region 39: www.region39.org
SAFECOM: www.safecomprogram.gov
Southern Area Coordination Center: gacc.nifc.gov/sacc
TEMA: www.tnema.org

TN COML Yahoo Group: groups.yahoo.com/groups/TN-COML
USGS Topo Maps: topomaps.usgs.gov
Weather Underground: www.wunderground.com
Wildland Fire Communications: www.fireradios.net
Wireless Priority Service (WPS): wps.ncs.gov
Winlink 2000: www.winlink.org

ICS Form Templates

The following page(s) contain(s) ICS forms which can be used as templates.

ICS FORM 213 – General Message

GENERAL MESSAGE (ICS 213)

1. Incident Name (Optional)**:**		
2. To (Name and Position)**:**		
3. From (Name and Position)**:**		
4. Subject:	**5. Date:**	**6. Time**
7. Message:		
8. Approved by: Name: _____ Signature: _____ Position/Title: _____		
9. Reply:		
10. Replied by: Name: _____ Position/Title: _____ Signature: _____		
ICS 213	Date/Time: _____	

ICS FORM 214 – Activity Log

ACTIVITY LOG (ICS 214)

1. Incident Name:	**2. Operational Period:** Date From: Time From:	Date To: Time To:
3. Name:	**4. ICS Position:**	**5. Home Agency** (and Unit)**:**

6. Resources Assigned:

Name	ICS Position	Home Agency (and Unit)

7. Activity Log:

Date/Time	Notable Activities

8. Prepared by: Name: _____ Position/Title: _____ Signature: _____

ICS 214, Page 1 Date/Time: _____

ICS FORM 205 - Incident Radio Communications Plan

INCIDENT RADIO COMMUNICATIONS PLAN	Incident Name	Date/Time Prepared	Operational Period Date/Time

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	Remarks
1									
2									
3									
4									
5									
6									
7									
8									
9									
10									
11									
12									
13									
14									
15									
16									

5. Prepared by (Communications Unit)	Incident Location County State Latitude N Longitude W

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 (Project 25)

ICS FORM 217A - Communications Resource Availability Worksheet

COMMUNICATIONS RESOURCE AVAILABILITY WORKSHEET										Frequency Band		Description	
	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		

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.

NOTES

NOTES

INDEX

Interoperability Continuum