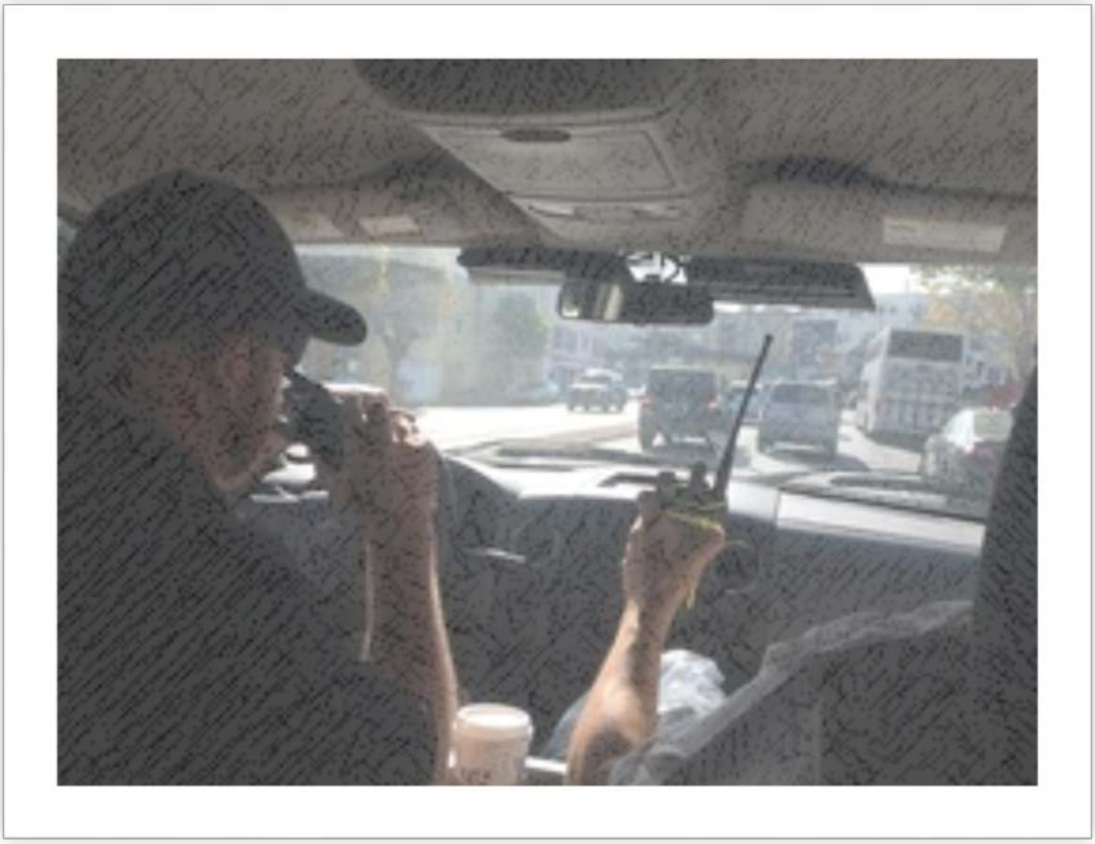


2015 Urban Shield Interoperable Radio Exercise

Results and Recommendations

Bay Area Regional Interoperable Communications Systems Authority (BayRICS) |

Barry Fraser, General Manager | November 20, 2015

EXECUTIVE SUMMARY

On September 11, 2015, in conjunction with the 2015 Urban Shield Yellow Command, eight Bay Area Public Safety agencies conducted tests of the region's advanced public safety radio communications systems. This Report provides test description, results, and recommendations from those tests, as well as Appendices with more detailed technical information about the tests.

Under Urban Shield's Yellow Command Exercise was conducted from 0900-1200 on Friday September 11, 2015. This exercise, consisting of both full-scale and functional exercise play components, was designed to engage all levels of Emergency Operations Centers (EOCs) and promote coordination between jurisdictions and agencies in response to a series of incidents occurring throughout the Region.

Yellow Command's *Regional Objective #3* involved the testing of alternative communication paths and interoperability across operational areas utilizing radio and satellite phone technologies. As part of this objective, the BayRICS Authority Technical Advisory Committee (TAC) and P25 Operators Advisory Group developed a series of interoperability radio tests across the region to validate the capabilities available with the Project 25 (P25) standards-based radio systems, and other advanced communications systems under development in the Bay Area. The objectives of the exercise included testing the technical radio programming procedures, regional talk group assignments and geographic coverage available with these new systems.

Results: Evaluators assigned to rate objective criteria determined that the tests were generally successful and demonstrated the interoperability capabilities of the systems and radios. In addition, evaluators found that the region's radio programming procedures and mutual aid channel/talk group assignments generally worked as expected. This was an important outcome for Bay Area Public Safety, which has invested millions of dollars in deploying the new systems. These tests demonstrate that the region's "system of systems" approach is capable of providing acceptable levels of interoperability and mutual aid support for the region.

Recommendations and Next Steps: After a review of the test results and evaluators comments, the P25 Operators advisory group recommends that the Bay Area conduct additional exercises simulating live operational conditions with the actual users of the technology—law, fire and EMS personnel. These tests should evaluate whether personnel are properly trained to use these new capabilities in a mutual aid scenario across P25 systems. The tests should also identify specific training and exercise needs for first responders, which can be incorporated into future regional training budgets.

The results also indicate a need to conduct additional research on Inter-Subsystem Interface (ISSI) technology, which failed to work as expected during the exercise. The results also indicate a need to conduct additional research on Inter-Subsystem Interface (ISSI) technology, which failed to work as expected during the exercise.

Finally, the advisory group recommends that radio technicians from all Bay Area agencies review the programming issues identified and resolved during these tests. We advise agency radio shops to collaborate on radio programming tasks, to ensure the programming and display read-outs are consistent on all radios used in the region. The P25 Operators advisory group will continue to meet monthly to share interoperable radio lessons learned and best practices. Agencies are encouraged to participate in the advisory group and may obtain more information by email to info@bayrics.net.

TEST DESCRIPTION

1. BACKGROUND

Several years ago the Bay Area devised a "system of systems" approach to upgrading the regions public safety radios to Project 25, standards-based technology. Thus, several agencies embarked on separate radio system upgrades, but with the understanding that the standards-based technology would be interoperable for mutual aid purposes. Currently, P25 systems have been completed in Alameda County, Contra Costa County and San Mateo County. Santa Clara County has partially installed a new P25 system, with coverage around Levi's Stadium in Santa Clara and in other areas. San Francisco has installed a P25 "overlay" network, and Marin County has deployed a 700 MHz conventional tactical system designed to interoperate with new digital radios. In addition, both San Francisco and Marin are in the planning stages of full upgrades to P25 compliant systems.

BayRICS Authority has been tasked with coordinating the work required to ensure that these separate systems are interoperable. BayRICS has established a "P25 Operators advisory group" to facilitate these efforts and provide a forum for resolving interoperability issues.

The P25 Operators designed a series of tests to (1) demonstrate the interoperability capabilities of these advanced radio systems, (2) verify the region's radio programming procedures, and (3) validate the channel and talk group allocations in the Bay Area's regional fleetmap guide. In addition, participating agencies wished to test the extent of overlapping coverage areas of these systems, and the ability to quickly switch radios from one system to another where this overlap is available. This capability is a key benefit for the Bay Area because it provides redundant coverage in the remote possibility that the primary system covering the area is lost.

The tests were then integrated into the 2015 Urban Shield Yellow Command Exercise. Because tests were technical in nature, as opposed to the operational and functional activities making up the bulk of the Yellow Command exercise, radio exercises were conducted in parallel to the Yellow Command exercise but executed separately.

2. PARTICIPATING AGENCIES

- City and County of San Francisco Police Department, Fire Department and Sheriff
- Bay AREA Rapid Transit (BART)
- County of San Mateo
- County of Marin
- East Bay Regional Communications Systems Authority (EBRCSA)
- County of Santa Clara
- City of Santa Clara
- County of Alameda

The test logistics and evaluation process was coordinated by the Bay Area Regional Interoperable Communications Systems Authority (BayRICS).

3. EXERCISE LOCATIONS AND SCENARIOS

The exercise was comprised of three separate activities:

Activity One (commenced at 0800) -- San Francisco to test communications on portable radios back to San Francisco's dispatch center at an underground BART station, using the BART 800 MHz P25 network and ISSI. Radio Test Checkpoints:

1. 24th and Mission Bart Station
2. Civic Center BART Station

Activity Two (commenced at 0900) -- San Francisco and Marin County to test San Francisco portable radios on Marin's 700 MHz conventional tactical channels. Radio Test Checkpoints:

1. SF Department of Emergency Management (DEM) – 1011 Turk St.
2. Golden Gate Bridge
3. Rainbow Tunnel (on Marin Side)
4. Larkspur Landing

Activity Three (commenced at 0930) -- San Mateo, Alameda County, and San Francisco to test their P25 portable radios in Santa Clara near Levi's Stadium, using SVRIA/Santa Clara's P25 network and five 700 MHz mutual aid talk groups. After that test, these participants test their radios on EBRCSA's and San Mateo's P25 networks and five 700 MHz mutual aid talk groups for coverage in Santa Clara near Levi's Stadium. Radio Test Checkpoints: All participants test radios adjacent to Levi's Stadium in Santa Clara. In addition, San Francisco to perform radio checks at these locations in route to Santa Clara:

1. 1011 Turk St.
2. SFO Airport
3. Hwy 92
4. Moffett Field
5. Levi's Stadium

The tests involved taking radios from several jurisdictions and calling dispatch centers for the primary coverage areas, to demonstrate that the radios were t programmed properly to operate on networks outside their home jurisdictions. We also made calls using the 6 mutual aid talk groups designated in the regional fleetmap guide to ensure that all participating agencies have applied the guidelines properly. Finally, participants made calls to dispatch centers for outside systems, to determine if coverage was available and that the radios could be quickly switched from one system to another in the field.

These were a series of technical performance tests, designed to build on to develop future operational exercises incorporating these advanced technical capabilities.

RESULTS

A total of 41 separate radio tests were conducted at 11 different locations in San Francisco, Marin, San Mateo and Santa Clara Counties. Three evaluators were assigned to rate objective criteria for each of the calls, including time and location of the call attempt, channel talk groups used, and the success in completing the call. Evaluations included feedback from both the field units making the call and the dispatch centers receiving the call, to evaluate the capabilities at both the sending and receiving ends of the calls. Results of each test are provided in Appendix 3.

The evaluators found that the tests were generally successful. Specifically, evaluators reported over 90% calling success rate, with 37 of 41 calls completed. Evaluators concluded that the interoperability capabilities of the systems and radios worked as expected, and validated the region's radio programming procedures and mutual aid channel/talk group assignments.

Radio coverage of all systems throughout the Bay Area was very good. In almost all cases, San Francisco, San Mateo and Alameda County/EBRCS radio techs were able to make calls back to their home networks from all test locations.

Evaluators reported failed calls during Activity One, and on certain radios used on Activity Three. Specifically:

> Activity One: None of the SFPD and SFSD radios worked underground on BART CALLING and BART Interop1-5 channels. Only SFFD radios worked underground. Radio staff has determined that the ISSI link between BART and San Francisco was not operational during the test.
>
> Activity Three: Apparent programming issues with San Mateo APX7000 and Santa Clara County APX7000 radio's caused a few tests to be incomplete. APX6000 radios worked fine. The programming issues were subsequently resolved and retesting of the radios was successful. Technicians have documented this issue and will share the fix with other P25 operators to ensure that it does not recur.

Evaluators were not asked to evaluate the quality of the audio communications, only whether each call was successfully completed. However, evaluators noted that digital audio was very clear and audible when in strong coverage, but when in weaker coverage areas, audio sometimes sounds "digitized." Digital transmission sometimes results in a different sound quality and experience for end users, which may take some getting used to. There may be opportunities for future training to prepare end users for this difference.

Lastly, evaluators commented favorably on the level of collaboration and communication among agency technicians during the tests, as they identified and quickly resolved programming issues.

RECOMMENDATIONS

The successful completion of these tests were an important outcome for Bay Area Public Safety, which is investing millions of dollars in deploying the new systems. These tests demonstrate that the region's "system of systems" approach is capable of providing acceptable levels of interoperability and mutual aid support for the region. In addition, the technical lessons learned in the course of the tests will be invaluable to the region as these new systems are completed.

After a review of the test results and evaluators comments, the P25 Operators advisory group makes the following recommendations:

1. The Bay Area should plan to conduct additional radio exercises simulating live operational conditions with the actual users of the technology—law, fire and EMS personnel. These tests should evaluate whether personnel are properly trained to use these new capabilities in a mutual aid scenario across P25 systems.
    a. The City and County of San Francisco developed a radio "cheat sheet" for this exercise as an aid for end users (See Appendix 2). Other agencies may find it useful to adopt a similar guide for their end users.
    b. Future exercises should also evaluate the impact of the digitized audio issue for end users.
    c. Specific training and exercise drills for first responder mutual aid radio operation should be incorporated into future regional training budgets.
2. The results indicate a need to conduct additional research on Inter-Subsystem Interface (ISSI) technology, which failed to work as expected during the exercise. Specifically, better maintenance is needed on the BART/SF ISSI link, to ensure link is stable and system is functioning as designed.
3. Radio shops (both P25 and conventional shops) should work more closely to develop and maintain consistent radio programming guidelines, particularly to ensure that mutual aid talkgroup/channel information is consistently programmed and displayed on all radios.
4. Radio technicians from all Bay Area agencies should review the programming issues identified and resolved during these tests, and take steps to ensure that these issues do not reoccur in future field exercises and incidents. Summary technical notes are provided in Appendix 1.

The P25 Operators advisory group will continue to meet monthly to host an open forum for technicians to discuss interoperable radio lessons learned and best practices. Agencies are encouraged to participate in the advisory group and may obtain more information by email to info@bayrics.net.

APPENDIX 1 – SUMMARY TECHNICAL NOTES

1. Equipment Notes

Agencies used Motorola APX6000 and APX7000 portable radios for field testing at most locations.

2. Talk Groups Tested

The region has adopted a regional fleetmap guide for interoperable talk groups and channels. The tests utilized the following talk groups, which are designated for regional mutual aid response:

North Bay:	West Bay:		East Bay:	South Bay:
Marin	San Francisco	San Mateo Co.	Alameda Co.	Santa Clara
700 MHz Conv: 7CALL50 7LAW81 7FIRE63 7FIRE64	-Calling (reserved only for testing) -Interop 1 -Interop 2 -Interop 3 -Interop 4 -Interop 5	-Calling (reserved only for testing) -Interop 1 -Interop 2 -Interop 3 -Interop 4 -Interop 5	-Calling (reserved only for testing) -Interop 1 -Interop 2 -Interop 3 -Interop 4 -Interop 5	-Calling (reserved only for testing) -Interop 1 -Interop 2 -Interop 3 -Interop 4 -Interop 5

3. Evaluators Notes

Activity 1:

BART ISSI TEST:
The exercise began at 0800 in the BART station at 24th and Mission. Radios from SFPD, SFFD and SFSD used for the test. We placed one unit above ground at 24th and Mission on street level monitoring SFCALL and SF INTEROP1-5. We also had 2 units below ground communicating on BART CALLING and BART Interop1-5. We also had a dispatcher monitoring at 1011 Turk St. on SFCALL and SF INTEROP1-5.

None of the SFPD and SFSD radios worked underground on BART CALLING and BART Interop1-5 channels. Only SFFD radios worked underground.

Radios could communicate below ground on the BART channels only. Radios underground could NOT communicate with field units above ground on the SF radio channels, nor with Dispatch. Units above ground on SF Channels could communicate with Dispatch. This suggests that the ISSI link between BART and San Francisco was not operational during the test.

The same test was repeated at Civic Center BART station with the same outcome. The test concluded at 8:20AM

Activity 2:

MARIN 700 MHz CONVENTIONAL TACTICAL CHANNELS TEST:
The exercise began at 0820 at 1011 Turk St. in San Francisco. SFFD, SFSD and SFPD radios communicated on the 700MHz Tactical Channels with Marin. 7CALL50 channel had excellent coverage starting at 1011 Turk St. 7LAW81 and 7FIRE63 repeaters were turned on at 0825. The coverage was limited on the Tactical channels, the audio was very digitized. Also, field units could not hear each other's audio, only Marin County Dispatch could hear it. Once the field units made it to the Rainbow Tunnel, audio was much clearer on the TAC channels. 7FIRE64 channel was also enabled for testing. The test was complete at 0900 and deemed successful.

Activity 3:

SANTA CLARA TEST:
Test began at 0930 near 1011 Turk St, using SFFD, SFPD and SFSD radios. Tests were conducted on South Bay Calling and South Bay Interop1-5. Radio coverage was very spotty in the City, and we got several bonks when testing within City limits. Units had good coverage on all channels near the Airport. Coverage was spotty and around highway 92 on the 101 hwy. Coverage was good again at Moffet Field and at Levi Stadium. All radios worked, and test deemed successful, and concluded at 1105.
All three radio systems, San Mateo, East Bay and San Francisco worked from Levi stadium, SF had a weak signal but still worked, all other systems had very strong signal strength.

EAST BAY and SAN MATEO TEST
East Bay test began at 1115 from Levi Stadium with SFPD, SFFD and SFSD radios using East Bay CALLING and East Bay Interop1-5 channels. East Bay Dispatch location could clearly hear the audio from all calls, and the test was deemed successful and concluded at 1115.

San Mateo test began at 1115 from Levi Stadium with SFPD, SFFD and SFSD radios using San Mateo CALLING and San Mateo Interop1-5 channels. San Mateo

EOC/Dispatch location could clearly hear the audio from all calls, and the test was deemed successful and concluded at 1115.

Apparent programming issues with San Mateo APX7000 and Santa Clara County APX7000 radio's caused a few tests to be incomplete. APX6000 radios worked fine. See resolution below.

STRENGTHS IDENTIFIED

1. Good involvement with DEM, SFFD and SFSD uniform personnel to dispatch centers/console positions.
2. Radio coverage of various systems throughout the Bay Area was very good. Digital audio was very clear and audible when in strong coverage. When in weak coverage area, audio sounds very digitized.
3. The radio checks followed and confirmed the policies included in the Bay Area Fleetmap guide and System Key sharing agreement.

AREAS FOR IMPROVEMENT

1. Continued/additional testing to engage end users, rather than radio technicians, during these tests.
2. SF 700MHZ Interop System needs more units added to the system and tested more rigorously. There was not testing on the 700MHz interop system from outside agencies during this comms drill.
3. Better maintenance of BART/SF ISSI link, to ensure link is stable and system is functioning as designed.
4. Noticed that when a radio first turns to a talkgroup/channel and is "listening to the channel" the first part of the audio is lost coming in from another unit talking on the channel. Need to train to that issue.
5. Potentially change SFInterop1-5 to SF Interop2-6 to match the channel position on the radio
6. Put control stations in the County Dispatch Centers to allow for easier patching of interop channels (i.e. Patch SF Interop1 to South Bay Interop 1 to have a regionwide talkgroup), or create Bay Area wide talkgroups.
7. More patching with VHF capability requested from the SFFD.
8. Several instances of what appear to be programming issues with San Mateo APX7000 and Santa Clara County APX7000 radio's caused a few tests to be incomplete. APX6000, worked fine

   RESOLUTION: We checked our programming which appeared to be correct. We tested 3 radios on three different San Mateo talk groups (SM-CALL, SM-INT 1, SM-INT 2) every radio could transmit to every radio, this suggests that SM must have patched the talk groups together on their console. Then we wiped all the programming related to San Mateo from the code plug, then rebuilt it from scratch and the problem was resolved.
9. Radio shops work more closely on programming, make sure the Alpha Numeric displays are the same on all radios. This would cause confusion if the display names are different in any way to public safety users.

APPENDIX 2 – SAN FRANCISCO CHEAT SHEET

Button Layout

Volume Control
Clockwise = Volume Up
Counter Clockwise = Volume Down

Light
Press to turn light on
Hold down to rotate text 180 degrees

Push-To-Talk
Press while transmitting

Zone Toggle
Toggles between Zone A, Zone B, and Zone C
Zone A can be reached to all times by toggling

Scan On/Off
Optional scan for approved radios

Channel Selector
Toggles between selector 1 - 16

Emergency Button
Hold down to enable/disable Emergency Transmit
Monitored on PD A bank and Event channels

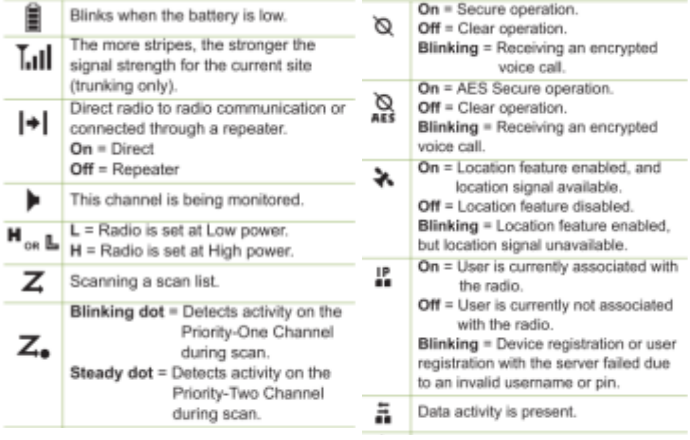
Zone Up / Down
Hold buttons for 1.5 seconds to change zones
Toggles up and down zones for Interoperability Zones

SFPD Patrol Template

	ZONE A	ZONE B	ZONE C	ZONE D	AIRPORT	SAN FRAN	BART	SanMateo	East Bay	SouthBay	700 TACS1	700 TACS2
1	PD A1	EVENT 1	8CALL90	BACKUP 1	SFO PD1	CALLING	CALLING	CALLING	CALLING	CALLING	7CALL50	7CALL70
2	PD A2	EVENT 2	8TAC91	BACKUP 2	SFO PD2	INTEROP1	INTEROP1	INTEROP1	INTEROP1	INTEROP1	7TAC51	7TAC71
3	PD A3	EVENT 3	8TAC92	BACKUP 3	SFO PD3	INTEROP2	INTEROP2	INTEROP2	INTEROP2	INTEROP2	7TAC52	7TAC72
4	PD A4	S EVENT1	8TAC93	BACKUP 4	SFO OPS1	INTEROP3	INTEROP3	INTEROP3	INTEROP3	INTEROP3	7TAC53	7TAC73
5	PD A5	S EVENT2	8TAC94	BACKUP 5	SFO ICS	INTEROP4	INTEROP4	INTEROP4	INTEROP4	INTEROP4	7TAC54	7TAC74
6	PD A6	S EVENT3	CALAW8	SPARE 1	SFO TAC1	INTEROP5	INTEROP5	INTEROP5	INTEROP5	INTEROP5	7TAC55	7TAC75
7	PD A7	*	CAFIRE1	SPARE 2	SFO TAC2	SFO INT1	CALAW9	*	8TAC91	BAYMACS	7TAC56	7TAC76
8	PD A8	*	CALAW9	SPARE 3	SFO TAC3	SFO INT2	CAFIRE1	*	8TAC91D	CALAW9	7GTAC57	7GTAC77
9	PD A9	*	CAFIRE2	SPARE 4	OPS 800	SFO INT3	*	*	8TAC92	CAFIRE2	7MOB59	7MOB79
10	PD A10	*	EOC 1	SPARE 5	FD 800	CALAW9	*	*	8TAC92D	*	7LAW61	7LAW81
11	PD A11	*	EOC 2	CCSF PD	PD 800	8TAC91	*	*	8TAC93	*	7LAW62	7LAW82
12	PD A12	*	PS DIR	UCSF PD	*	8TAC92	*	*	8TAC93D	*	7FIRE63	7FIRE83
13	PD A13	*	PD DIR 1	SFSU PD	*	8TAC93	*	*	8TAC94	*	7FIRE64	7FIRE84
14	PD A14	*	PD DIR 2	ANIMAL	*	8TAC94	*	*	8TAC94D	*	7MED65	7MED86
15	SCOFFLAW	*	SEC DIR1	PD A15	*	*	*	*	*	*	7MED66	7MED87
16	TOW DESK	*	SEC DIR2	PD A16	*	8CALL90	*	*	8CALL90	8CALL90	*	*

Regional Contacts	Law Enforcement	Fire/EMS
San Francisco (City and County) Dispatch	415-575-0737	415-558-3291
San Francisco Airport Dispatch	650-876-2323	650-876-2323
Alameda County Dispatch	510-557-7777	925-422-7595
Contra Costa County Dispatch	925-933-1313	925-646-2441
Santa Clara County Dispatch	408-294-4424	408-294-4424
San Mateo County Dispatch	650-363-4911	650-364-1313
BART Dispatch Dispatch	510-464-7000	510-834-1297
Marin County Dispatch	415-479-2311	415-479-2311

Radio Display Info



Button Layout

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Zone A can be reached to all times by toggling

Channel Selector

Toggles between selector 1 - 16

Emergency Button

Hold down to enable/disable Emergency Transmit

Zone Up / Down

Hold buttons for 1.5 seconds to change zones

Toggles up and down zones for Interoperability Zones

SFFD Standard Template

	ZONE A	ZONE B	ZONE C	SFO A	SFO B	700-SF	BART	700-SM	700-EB	700-SB	700TACS1	700TACS2
1	FD A1	EVENT 1	1.8CAL90	SFO-FD1	SFO-PD1	CALLING	CALLING	CALLING	CALLING	CALLING	7CALL50	7CALL70
2	FD A2	EVENT 2	2.8TAC91	SFO-FD2	SFO-PD2	INTEROP1	INTEROP1	INTEROP1	INTEROP1	INTEROP1	7TAC51	7TAC71
3	FD A3	EVENT 3	3.8TAC92	SFO-FD3	SFO-PD3	INTEROP2	INTEROP2	INTEROP2	INTEROP2	INTEROP2	7TAC52	7TAC72
4	FD A4	S EVENT1	4.8TAC93	*	SFO-TAC1	INTEROP3	INTEROP3	INTEROP3	INTEROP3	INTEROP3	7TAC53	7TAC73
5	FD A5	S EVENT2	5.8TAC94	SFO-OPS1	SFO-TAC2	INTEROP4	INTEROP4	INTEROP4	INTEROP4	INTEROP4	7TAC54	7TAC74
6	FD A6	S EVENT3	C6 LAW8	SFO-OPS2	SFO-TAC3	INTEROP5	INTEROP5	INTEROP5	INTEROP5	INTEROP5	7TAC55	7TAC75
7	FD A7	B7/Unpr	C7 FIRE1	SFO-OPS3	SFO-INT1	SFO-INT1	C7 FIRE1	AMR RED	8TAC91	BAYMACS	7TAC56	7TAC76
8	FD A8	B8/Prev	C8 LAW9	SFO-ADM	SFO-INT2	SFO-INT2	*	MCI 1	8TAC91D	CALAW9	7GTAC57	7GTAC77
9	FD A9	B9/AWSS	C8 FIRE2	SFO-SOC	SFO-INT3	SFO-INT3	C8 FIRE2	MCI 2	8TAC92	CAFIRE2	7MOB59	7MOB79
10	FD A10	B10/BofE	10.EOC 1	SFO-ICS	OPS 800	CALAW9	*	SFGH	8TAC92D	*	7LAW61	7LAW81
11	FD A11	SFPD A11	11.EOC 2	FD T/A 1	FD 800	8TAC91	*	*	8TAC93	*	7LAW62	7LAW82
12	FD A12	B12/DofT	12.FDBU1	FD T/A 2	PD 800	8TAC92	*	*	8TAC93D	*	7FIRE63	7FIRE83
13	FD A13	B13/Unpr	13.FDBU2	AMR RED	*	8TAC93	*	*	8TAC94	*	7FIRE64	7FIRE84
14	FD A14	B14/Unpr	14.FDTA1	MCI 1	*	8TAC94	14.FDTA1	*	8TAC94D	*	7MED65	7MED86
15	FD A15	B15/EMS3	15.FDTA2	MCI 2	*	*	15.FDTA2	*	*	*	7MED66	7MED87
16	FD A16	B16/EMS4	16.PS TA	SFGH	*	8CALL90	16.PS TA	*	8CALL90	8CALL90	*	*

Regional Contacts	Fire/EMS	Law Enforcement
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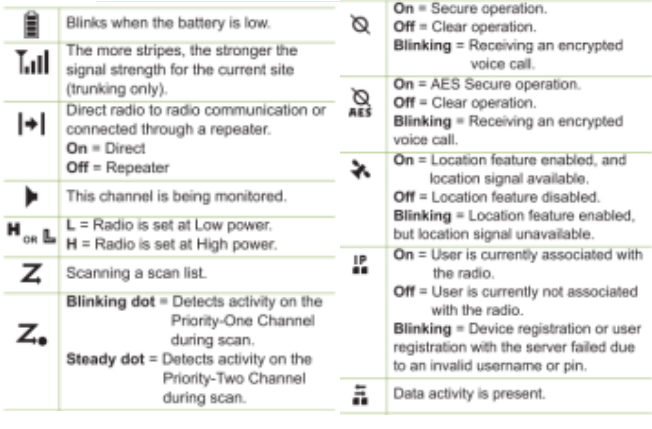

Button Layout

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Hold buttons for 1.5 seconds to change zones
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SFSD Sworn Template

	ZONE A	ZONE B	ZONE C	ZONE D	SAN FRAN	AIRPORT	BART	SanMateo	East Bay	SouthBay	700 TACS1	700 TACS2
1	A1 CJ1	EVENT 1	8CALL90	CCSF PD	CALLING	SFO PD1	CALLING	CALLING	CALLING	CALLING	7CALL50	7CALL70
2	A2 CJ2	EVENT 2	8TAC91	UCSF PD	INTEROP1	SFO PD2	INTEROP1	INTEROP1	INTEROP1	INTEROP1	7TAC51	7TAC71
3	A3 CJ3	EVENT 3	8TAC92	SFSU PD	INTEROP2	SFO PD3	INTEROP2	INTEROP2	INTEROP2	INTEROP2	7TAC52	7TAC72
4	A4 CJ4	S EVENT1	8TAC93	ANIMAL	INTEROP3	SFO OPS1	INTEROP3	INTEROP3	INTEROP3	INTEROP3	7TAC53	7TAC73
5	A5 CJ5	S EVENT2	8TAC94	SCOFFLAW	INTEROP4	SFO ICS	INTEROP4	INTEROP4	INTEROP4	INTEROP4	7TAC54	7TAC74
6	A6	S EVENT3	CALAW8	TOW DESK	INTEROP5	SFO TAC1	INTEROP5	INTEROP5	INTEROP5	INTEROP5	7TAC55	7TAC75
7	A7	PD A2	CAFIRE1	BACKUP 1	SFO INT1	SFO TAC2	CALAW9	*	8TAC91	BAYMACS	7TAC56	7TAC76
8	A8	PD A4	CALAW9	BACKUP 2	SFO INT2	SFO TAC3	CAFIRE1	*	8TAC91D	CALAW9	7GTAC57	7GTAC77
9	A9	PD A6	CAFIRE2	SPARE 1	SFO INT3	OPS 800	*	*	8TAC92	CAFIRE2	7MOB59	7MOB79
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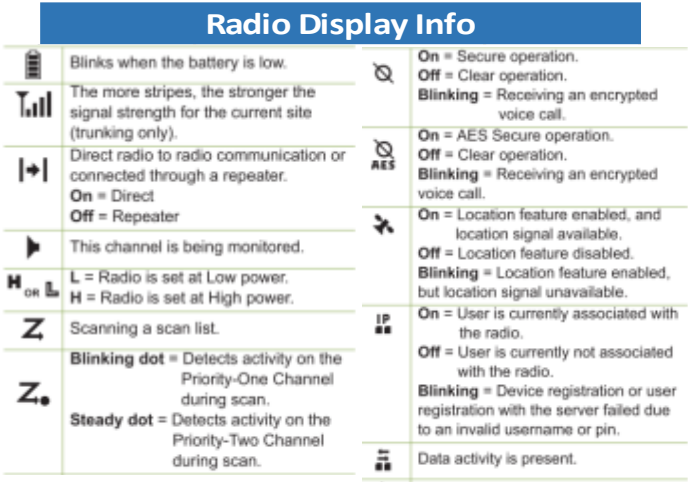
11	A11	PD A9	EOC 2	SPARE 3	8TAC91	PD 800	*	*	8TAC93	*	7LAW62	7LAW82
12	*	PD A10	PS DIR	SPARE 4	8TAC92	*	*	*	8TAC93D	*	7FIRE63	7FIRE83
13	A13	PD A11	PD DIR 1	SPARE 5	8TAC93	*	*	*	8TAC94	*	7FIRE64	7FIRE84
14	A14	PD A12	PD DIR 2	*	8TAC94	*	*	*	8TAC94D	*	7MED65	7MED86
15	A15 TAC	PD A13	*	*	*	*	*	*	*	*	7MED66	7MED87
16	A16 DISP	PD A14	*	*	8CALL90	*	*	*	8CALL90	8CALL90	*	*

Regional Contacts	Law Enforcement	Fire/EMS
San Francisco (City and County) Dispatch	415-575-0737	415-558-3291
San Francisco Airport Dispatch	650-876-2323	650-876-2323
Alameda County Dispatch	510-557-7777	925-422-7595
Contra Costa County Dispatch	925-933-1313	925-646-2441
Santa Clara County Dispatch	408-294-4424	408-294-4424
San Mateo County Dispatch	650-363-4911	650-364-1313
BART Dispatch Dispatch	510-464-7000	510-834-1297
Marin County Dispatch	415-479-2311	415-479-2311

Radio Display Info



APPENDIX 3 – INDIVIDUAL TEST EVALUATIONS

Yellow Command Interop Exercise Evaluation Guide

Evaluators:	Evaluator Contact Info:
Mark Anderson David Sanchez Michelle Geddes	Anderson: 408-892-0178 Sanchez: 408-207-3243 Geddes: 415-558-3825
Location: Levi stadium; various in Marin, San Francisco, San Mateo and Santa Clara Counties	

Core Capability, Capability Target, and Objectives

Operational Communications

Capability Description:
Ensure the capacity for timely communications in support of security, situational awareness, and operations by any and all means available, among and between affected communities in the impact area and all response forces.

Capability Target: Establish and test interoperable voice communications between local first responders.

Exercise Description: In response to notification of an incident, provide and receive interoperable voice communications.

Objectives:

1. Determine if each participating agency can use agency-owned radios to establish voice interoperable communications on networks operated by other jurisdictions in the San Francisco Bay Area Region.
2. Evaluate the geographic range of voice interoperable communications between participating agencies in the San Francisco Bay Area Region.
3. Evaluate the current mutual aid radio programming procedures and guidelines used by participating agencies and assess the need for additional policies and procedures.

Tasks

Main MSEL Tasks

Activity One:

San Francisco will test communications on portable radios back to San Francisco's dispatch center at an underground BART station, using the BART P25 network and ISSI.

Tasks Observed (Check those that were observed and provide comments)

MSEL #	Task /Observation Keys	Time of Observation/ Task Completion
101	San Francisco calls San Francisco's dispatch center Location: 24th and Mission Bart Station - test alias/unit IDs - test emergency - test fast start	Time: (0800) Time Completed 8:05 Talk Group(s) BART Interop 1 + BART CALLING Task Completed? Fully [ ] Partially [X] Not [ ] N/A [ ] Why not? Could not hear at SF Dispatch Center
102	• San Francisco's dispatch center receives call • Unit above ground receives call	Time: (0800) Time Completed Task Completed? Fully [ ] Partially [ ] Not [X] N/A [ ] Why not?
103	San Francisco calls San Francisco's dispatch center Location: Civic Center BART Station	Time: (0830) Time Completed 8:15 Talk Group(s) Task Completed? Fully [ ] Partially [ ] Not [ ] N/A [ ] Why not?
104	San Francisco's dispatch center receives call • Unit above ground receives call	Time: (0830) Time Completed Task Completed? Fully [ ] Partially [ ] Not [ ] N/A [ ] Why not?

Activity Two:

San Francisco and Marin County will test San Francisco portable radios on Marin's 700 MHz conventional tactical channels

Tasks Observed (Check those that were observed and provide comments)

MSEL #	Task /Observation Keys	Time of Observation/ Task Completion
201	San Francisco calls Marin County using 700 MHz Conventional Tactical Channels Location: DEM – 1011 Turk St	Time: (0900) Time Completed 8:25, 8:30, 8:32 Talk Group(s) 7CALL50, 7LAW81, 7FIRE63 Task Completed? Fully [ ] Partially [ ] Not [ ] N/A [ ] Why not? 7LAW81 works 7Fire63 bad audio
202	Marin County Receives San Francisco Call • other unit receives call	Time: (0900) Time Completed 8:30 Task Completed? Fully [X] Partially [ ] Not [ ] N/A [ ] Why not?
203	San Francisco calls Marin County using 700 MHz Conventional Tactical Channels Location: Golden Gate Bridge	Time: (0915) Time Completed 8:50 Talk Group(s) 7CALL50, 7Fire64, 7LAW81 Task Completed? Fully [ ] Partially [X] Not [ ] N/A [ ] Why not? 7CALL50 worked 7Fire64 very digitized audio 7LAW81 - worked but short transmissions were not heard by other units
204	Marin County Receives San Francisco Call • other unit receives call	Time: (0915) Time Completed Task Completed? Fully [ ] Partially [X] Not [ ] N/A [ ] Why not? See above

205	San Francisco calls Marin County using 700 MHz Conventional Tactical Channels Location: Rainbow Tunnel (on Marin Side)	Time: (0930) Time Completed 8:55am Talk Group(s) 7CALL50, 7LAW81, 7FIRE64 Task Completed? Fully [X] Partially [ ] Not [ ] N/A [ ] Why not?
206	Marin County Receives San Francisco Call	Time: (0930) Time Completed 8:55 am Task Completed? Fully [X] Partially [ ] Not [ ] N/A [ ] Why not?
207	San Francisco calls Marin County using 700 MHz Conventional Tactical Channels Location: Larkspur Landing	Time: (0945) Time Completed 9:02 Talk Group(s) 7CALL50, 7LAW81, 7FIRE64 Task Completed? Fully [X] Partially [ ] Not [ ] N/A [ ] Why not?
208	Marin County Receives San Francisco Call	Time: (0945) Time Completed 9:03 Task Completed? Fully [X] Partially [ ] Not [ ] N/A [ ] Why not?

Activity Three:

San Mateo, Alameda County, and San Francisco will test their portable radios in Santa Clara near Levi's Stadium, using SVRIA/Santa Clara's P25 network mutual aid interop channels. After that test, these participants will test their radios on EBRCSA's and San Mateo's P25 network mutual aid interop channels for coverage in Santa Clara near Levi's Stadium.

Tasks Observed (Check those that were observed and provide comments)

SANTA CLARA DISPATCH CALLS BEGIN AT 0930		
MSEL #	**Task /Observation Keys**	**Time of Observation/ Task Completion**
301	San Mateo calls Santa Clara Dispatch Location: Levi's Stadium Soccer Field	Time: (0930) Time Completed **9:38am** Talk Group(s) **SB-Call, SB INT 1-5** Task Completed? Fully [**X**] Partially [ ] Not [ ] N/A [ ] Why not? **Programming issue with SM APX7000, completed with APX6000, worked fine**
302	Santa Clara Receives San Mateo Call	Time: (**0934**) Time Completed **__0938**_____ Task Completed? Fully [**x**] Partially [ ] Not [ ] N/A [ ] Why not? **PROGRAMMING ISSUE WITH 1ST PORTABLE ON SB INT TALKGROUPS. 2ND PORTABLE WAS PERFECT, NO ISSUES.**
303	Alameda calls Santa Clara Dispatch Location: Levi's Stadium Soccer Field	Time: (0945) Time Completed **9:33am** Talk Group(s) **SB-Call, SB INT 1-5** Task Completed? Fully [**X**] Partially [ ] Not [ ] N/A [ ] Why not? **Experienced a few busy signals upon key-up, SB-INT 1 & 2**
304	Santa Clara Receives Alameda Call	Time: (**0930**) Time Completed **___0932**_____ Task Completed? Fully [**x**] Partially [ ] Not [ ] N/A [ ] Why not? **NO ISSUES, PERFECT TEST.**

311	San Francisco calls Santa Clara Dispatch Location: 1011 Turk St	Time: (1000) Time Completed **0930** Talk Group(s) **SB Calling, Interop 1-5** Task Completed? Fully [**X**] Partially [ ] Not [ ] N/A [ ] Notes: **some intermittent banking, not many bars/coverage** **Asked to see if radio Alias was correct, it was on 3 radios.**
312	Santa Clara Receives San Francisco Calls	Time: (**0945**) Time Completed ____**0947**_____ Task Completed? Fully [**X**] Partially [ ] Not [ ] N/A [ ] Why not? **NO ISSUES.**
313	San Francisco calls Santa Clara Dispatch Location: SFO Airport	Time: (1015) Time Completed **1021** Talk Group(s) **SB Calling, Interop 1-5** Task Completed? Fully [**X**] Partially [ ] Not [ ] N/A [ ] Why not? _____
314	Santa Clara Receives San Francisco Calls	Time: (1015) Time Completed __**1016**_____ Task Completed? Fully [**X**] Partially [ ] Not [ ] N/A [ ] Why not? **NO ISSUES.**
315	San Francisco calls Santa Clara Dispatch Location: Hwy 92	Time: (1030) Time Completed **1030** Talk Group(s) **SB Calling, Interop 1-5** Task Completed? Fully [ ] Partially **[X**] Not [ ] N/A [ ] Why not? **Coverage spotty**

316	Santa Clara Receives San Francisco Calls	Time: (1030) Time Completed **1033** Task Completed? Fully [**X**] Partially [ ] Not [ ] N/A [ ] Why not? **COVERAGE ISSUES NEAR 101/92. PORTABLE HAD VERY POOR TX AUDIO AT TIMES. NOTE: PALO ALTO SITE IS NOT ACTIVE YET.**
317	San Francisco calls Santa Clara Dispatch Location: Moffet Field	Time: (1045) Time Completed **1055am** Talk Group(s) **SB Calling, Interop 1-5** Task Completed? Fully [**X**] Partially [ ] Not [ ] N/A [ ] Why not? _____
318	Santa Clara Receives San Francisco Calls	Time: (1045) Time Completed _____**1055**_____ Task Completed? Fully [**X**] Partially [ ] Not [ ] N/A [ ] Why not? **NO ISSUES, PERFECT TEST.**
319	San Francisco calls Santa Clara Dispatch Location: Levi's Stadium Soccer Field	Time: (1100) Time Completed **1105** Talk Group(s) **SB Calling, Interop 1-5** Task Completed? Fully [**X**] Partially [ ] Not [ ] N/A [ ] Why not? _____
320	Santa Clara Receives San Francisco Calls	Time: (1100) _____**1111**_____ Task Completed? Fully [**X**] Partially [ ] Not [ ] N/A [ ] Why not? **NO ISSUES, PERFECT TEST.**
1115 -- END OF SANTA CLARA DISPATCH TASK		

EBRCSA DISPATCH CALLS BEGIN AT 1030		
MSEL #	**Task /Observation Keys**	**Time of Observation/ Task Completion**
321	San Mateo calls EBRCSA Dispatch Location: Levi's Stadium Soccer Field	Time: (1030) Time Completed **1040** Talk Group(s) _____EB-CALL, ED INT 1-5 Task Completed? Fully [X] Partially [ ] Not [ ] N/A [ ]
322	EBRCSA Dispatch receives San Mateo Call	Time: (1030) Time Completed ____1040_____ Task Completed? Fully [X] Partially [ ] Not [ ] N/A [ ] Why not? _____
323	Santa Clara County calls EBRCSA Dispatch Location: Levi's Stadium Soccer Field	Time: (1045) Time Completed **10:45-10:51am** Talk Group(s) **__EB-CALL, ED INT 1-5** B-Task Completed? Fully [**X**] Partially [ ] Not [ ] N/A [ ] Why not? _____
324	EBRCSA Dispatch receives Santa Clara Call	Time: (1045) Time Completed __1051_____ Task Completed? Fully [X] Partially [ ] Not [ ] N/A [ ] Why not? _____

325	San Francisco calls EBRCSA Dispatch Location: Levi's Stadium Soccer Field	Time: (1115) Time Completed **1115**_ Talk Group(s) **EB Calling, EB Interop 1-5** Task Completed? Fully [**X**] Partially [ ] Not [ ] N/A [ ] Why not? _____
326	EBRCSA Dispatch Receives San Francisco Call	Time: (1115) Time Completed _____1121_____ Task Completed? Fully [X] Partially [ ] Not [ ] N/A [ ] Why not? _____
1130 -- END OF EBRCSA DISPATCH TASK		

SAN MATEO COUNTY DISPATCH CALLS BEGIN AT 1045		
MSEL #	**Task /Observation Keys**	**Time of Observation/ Task Completion**
331	Alameda County calls San Mateo ~~Dispatch~~ **EOC** Location: Levi's Stadium Soccer Field	Time: (1045) Time Completed __**10:50**_____ Talk Group(s) ___**SM-CALL, SM INT 1-5** Task Completed? Fully [**X**] Partially [ ] Not [ ] N/A [ ] Why not? _____
332	San Mateo ~~Dispatch~~ **EOC** Receives Alameda County Call	Time: (1045) Time Completed ___1051_____ Task Completed? Fully [X] Partially [ ] Not [ ] N/A [ ] Why not? _____
333	Santa Clara County calls ~~Dispatch~~ **EOC** Location: Levi's Stadium Soccer Field	Time: (1100) Time Completed ___**11:00**___ Talk Group(s) __**SM-CALL,** SM INT 1-5 Task Completed? Fully [ ] Partially [**X**] Not [ ] N/A [ ] Why not? ____**Radio not working correctly on SM-INT 1-5**_____
334	San Mateo ~~Dispatch~~ **EOC** receives Santa Clara Call	Time: (1100) Time Completed _____1110_____ Task Completed? Fully [ ] Partially [X] Not [ ] N/A [ ] Why not? _____
335	San Francisco calls San Mateo ~~Dispatch~~ **EOC** Location: Levi's Stadium Soccer Field	Time: (1130) Time Completed **1115** Talk Group(s) **SM Calling, SM Interop 1-5** Task Completed? Fully [**X**] Partially [ ] Not [ ] N/A [ ] Why not? _____

336	San Mateo ~~Dispatch~~ **EOC** receives San Francisco Call	Time: (1130) Time Completed _____1120_____ Task Completed? Fully [X] Partially [ ] Not [ ] N/A [ ] Why not? _____
1145 -- END OF SAN MATEO DISPATCH TASK		