

GMRS Test Plan – DRAFT

Cupertino Citizen Corps

3 March 2022

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1 Introduction

The City of Cupertino supports the deployment of communication capabilities that would support the city during an emergency where city volunteers would be deployed. To complement the existing Amateur Radio Service capabilities, city investments were made in radio equipment within the General Mobile Radio Service (GMRS) and Family Radio Service (FRS) that would be managed by Cupertino Citizen Corps (CCC) volunteers.

This test plan will focus on the GMRS/FRS radio systems in providing two-way end-to-end communications between neighborhood field teams city ARKs, and the EOC.

2 Objectives and Tasks

2.1 Objectives

Objectives	Measures
1. Confirm two-way communications between the city ARKs and the EOC using GMRS.	<ol style="list-style-type: none">1. Each ARK demonstrates sufficient transmission signal quality with the EOC.2. All ARK and Comm 469 GMRS stations can operate on both simplex and repeater channels.
2. Confirm reliable two-way communications between volunteer field teams (CERT, Block Leader (BL), and Neighborhood Watch (NW)) and the ARKs using GMRS and FRS.	<ol style="list-style-type: none">1. All neighborhood field teams have configured their FRS radios to correctly work on the Channel and Tone for their ARK Zone.2. At least one neighborhood field team in each ARK zone can establish and maintain radio contact with their respective ARK.
3. Roll up information from neighborhood field reports to the EOC.	<ol style="list-style-type: none">1. Neighborhood field teams can pass effective messages to their respective ARKs using GMRS/FRS frequencies.2. ARK stations can pass effective messages to the EOC using GMRS frequencies.
4. Disseminate information from the EOC to neighborhood field teams.	<ol style="list-style-type: none">1. The EOC can originate and pass messages to each ARK for local dissemination.2. ARK stations can pass messages intended for all neighborhood field teams using the appropriate FRS frequencies.

2.2 Tasks

The tasks to be performed are:

1. Complete the GMRS Radio Pack battery upgrade to 6Ah LFP (LiFePO4) batteries.
2. Confirm the Comm 469 antenna configuration to support GMRS operations.
3. Communicate to Citizens Corps the up-coming communications test on 23-April and the training activities
4. TEST: Perform an ARK to Comm 469 GMRS radio test on GMRS simplex and a repeater.
5. Evaluate the test performance, make recommendations for changes.
6. Hold two or more orientation training on FRS radio operations for CERT/BL/NW members.
7. Hold two or more hands-on radio sessions to set up, verify, and test personal FRS radios on their respective channels.
8. TEST: perform a city-wide, end-to-end, two-way radio of test using GMRS and FRS.
9. Evaluate the test performance, make recommendations for changes.

3 Scope

3.1 In Scope

1. Operate at the 6 ARKs, Marianist Center, Comm 469 (at City Hall), and neighborhood locations.
2. Involve as many CERT, BL, and NW members as possible.
3. Operate each ARK Radio Pack (GMRS) on their respective ARK channel/tone configuration for intra-zone communications with neighborhood field teams.
4. Use configured personal FRS Radios if available.
5. Use ARK Radio Pack FRS radios if necessary.
6. Operate Comm 469 GMRS radio system with the agreed-to antenna configuration.
7. Opportunistically, invite all CARES GMRS license holders to participate.
8. Test the WQXG480 (Fire Family) GMRS Repeater.
9. ARKs record the reception from the other ARKs as a general coverage test.
10. Set up and leave one GMRS Radio Pack FRS HT for EOC reception.

3.2 Out of Scope

1. Test other bay area GMRS Repeaters.
2. Deployment-level message passing.

4 Test Schedule

This list contains a mix of preparation work, training, and actual tests. Additional training activities may be added as necessary.

Date	Activity	Description	Location
28-Feb-2022, 4:30pm	Prep	Share plan with CCC Steering Committee	Zoom
2-March-2022, 9:00am	Prep	Confirm the Comm 469 Antenna arrangement	Service Center
7-March-2022	Announce	to CCC members on field test & training	email
12-March-2022, 10:00am	Test	Perform the ARK-to-EOC GMRS radio test.	EOC, ARKs
16-March-2022, 7:00pm	Training	CERT/BL/NW Communications orientation	Zoom, 1 hour
19-March-2022, 10:00am	Training	FRS radio hands-on session	MVA, 1 hour
30-March-2022, 7:00pm	Training	CERT/BL/NW Communications orientation	Zoom, 1 hour
2-April-2022, 10:00am	Training	FRS radio hands-on session	City Hall, 1 hour
23-April-2022, 9:00am	Test	Perform field to EOC GMRS/FRS test	EOC, ARKs, Field

5 Resources, Roles, and Responsibilities

Resources will include the following:

Test 1: 12-March-2022, ARK to Comm 469 GMRS radio test

Name	Position
1.	Monta Vista ARK
2.	Regnart ARK
3.	Garden Gate ARK
4.	Lawson ARK
5.	DeAnza ARK
6.	Creekside ARK
7.	OEM Trailer
8.	Marianist Center
9.	Comm 469 Operator
10.	Shift Supervisor
11.	Comm 469 test coordination NCO (TAC3)
12.	Comm 469 GMRS Net Control

Test 2: 23-April-2022, city-wide, end-to-end, two-way radio test

Name	Position
1.	Monta Vista ARK
2.	Regnart ARK
3.	Garden Gate ARK
4.	Lawson ARK
5.	DeAnza ARK
6.	Creekside ARK
7.	Marianist Center
8.	Comm 469 Operator
9.	Shift Supervisor
10.	Comm 469 test coordination NCO (TAC3)
11.	Comm 469 GMRS Net Control

6 Training Activity

6.1 Communications orientation

1. WHO: CERT, Block Leaders, Neighborhood Watch, Organized Neighborhoods.
2. WHEN: Two or more **Zoom** sessions so we can get as many CERT members involved as possible.
3. PURPOSE: Introduction or refresher on *Field Communications (with FRS)*.
 - a. use the [CERT Field Communications Handbook](#).
 - b. Radio channels and tones
 - c. Communications Basics
 - d. Operating on the CERT radio net
 - e. Passing Messages
 - f. Radio Overview

6.2 Hands-on Radio Workshop

1. WHO: CERT, Block Leaders, Neighborhood Watch, Organized Neighborhoods.
2. WHEN: Two or more **face to face** sessions:
 - a. Monta Vista ARK
 - b. Cupertino City Hall
3. PURPOSE: Help field responders confirm their personal radios are configured correctly.
 - a. use the [CERT Field Communications Handbook](#).
 - b. Check that radio channels and tones are set correctly
 - c. Demonstrate basic radio operations (PTT, speaking, field use)
 - d. Perform a radio check

7 Test Activity

7.1 ARK-to-EOC Basic GMRS Test

1. Before the test:
 - a. All GMRS Radio Pack holders should confirm that pack battery is charged.
 - b. If you want a radio test prior to this day, please let Steve or Jim know.
2. Schedule:
 - a. Test Date: Saturday, 12-Mar-2022
 - b. Test Setup: 9:30am
 - c. Test Run: 10:00am.
 - d. Test Complete: 10:30am
3. Comm 469 set up at City Hall. This includes:
 - a. Retrieve Comm 469, drive to City Hall
 - b. General Comm 469 setup, including install GMRS Antenna on mast position A8.
 - c. Mast raised to full height.
 - d. Set up GMRS Radio; connect antenna, power on.
4. All GMRS Radio Pack holders respond to their respective ARKs and set up. This includes:
 - a. Open the ARK
 - b. Pull out a table, chair(s)
 - c. Attach mag mount antenna on the ARK roof (all by Monta Vista)
 - d. Set up the GMRS Radio Pack
 - e. Start on CH 7 / Tone 27.
5. Establish the CARES Net Control open net at Comm 469; coordinates any test issues on TAC3 W6TDM; should be nothing to do if it all works as planned.
6. Establish the GMRS Net Control (NCO) directed net at Comm 469.
7. GMRS NCO runs the test as follows:
 - a. All stations start on GMRS Channel 7 / Tone 27
 - b. GMRS NCO calls each Zone and ARK Name. Stations respond with their Ark Name, GMRS Call sign, and signal report. Reports would be something like: Loud and Clear, Loud and Scratchy, weak and scratchy, etc.
 - c. GMRS NCO calls for any other stations on the channel.
 - d. Once complete, GMRS NCO directs all stations to move to Channel 20R / Tone 31.
 - e. GMRS NCO calls each Zone and ARK Name. Stations respond with their Ark Name, GMRS Call sign, and signal report.
 - f. When done, the test is complete.
8. For any problems, contact C469 on CARES TAC3, or by cell phone.
9. The test should take no more than 30 minutes.

7.2 Field to EOC GMRS/FRS Test

1. Before the test:
 - a. All GMRS Radio Pack holders should confirm that pack battery is charged. If you want a radio test prior to this day, please let Steve or Jim know.
 - b. CERT/BL/NW FRS radio holders have been trained and their radios' configurations confirmed.
2. Schedule:
 - a. Test Date: Saturday, 23-Apr-2022
 - b. Test Setup: 9:15am
 - c. Test Run: 10:00am.
 - d. Test Complete: 11:00am
3. Comm 469 set up at City Hall. This includes:
 - a. Retrieve Comm 469, drive to City Hall
 - b. General Comm 469 setup, including install GMRS Antenna on mast position A8.
 - c. Mast raised to full height.
 - d. Set up GMRS Radio; connect antenna, power on.
4. All GMRS Radio Pack holders respond to their respective ARKs and set up. This includes:
 - a. Open the ARK
 - b. Pull out a table, chair(s)
 - c. Attach mag mount antenna on the ARK roof (all by Monta Vista)
 - d. Set up the GMRS Radio Pack
 - e. Start on CH7 / Tone 27.
5. All CERT/BL/NW neighborhood field teams verify their radios are set to the correct ARK Channel and Tone setting
6. Establish the CARES Net Control open net at Comm 469; coordinates any test issues on TAC3 W6TDM; should be nothing to do if it all works as planned.
7. Establish the GMRS Net Control (NCO) directed net at Comm 469.
8. 9:45am: GMRS NCO performs a roll call on GMRS CH7 / Tone 27 of all ARK stations (makes sure they are all present). Answer any last-minute questions on what to do.
9. 10:00am: ARK Net Control switches to their respective ARK Channel / Tone. They announce they will take check-ins. Include:
 - a. the number of CERT members present,
 - b. the number of houses on their street (or something similar, keep it simple)
10. CERT members check in, pass the requested information.
11. 10:25am: ARK Net Control asks field operators to stand by.
12. ARK Net Control prepares to pass this information to the EOC:
 - a. Cumulative total number of field stations that checked in.
 - b. Cumulative total number of CERT members present.
 - c. Cumulative total number of houses on their street.
13. At 10:30am, ARK Net Control switches back to GMRS CH7/T27.
14. GMRS Net Control calls each ARK, takes reports on # of field responders who checked in, and the roll-up report
15. EOC sends a message to the ARKs with a specific message for the field. ARKs confirm receipt.
16. ARK Net Controls send message to their respective field operators.
17. By 11:00am, test is complete.
18. Anything else?

8 Dependencies

This plan requires the following:

1. All ARKS are opened to support both tests.
2. All GMRS Radio Packs are deployed to their respective ARK.
3. Comm 469 is deployed to City Hall and configured to operate on the GMRS frequencies
4. Others?

9 Risks, Assumptions

9.1 Risks

1. Any?

9.2 Assumptions

1. As many CERT/BL/NW members as possible participate in communications orientation, hands-on radio, and the field-to-EOC radio test.
2. Others?

End of plan