

*Welcome...*

**2020 Challenge Cup Relay**

**New Team Captain**

**Communications Seminar**

# Do I really need to communicate?



# Do I really need to communicate?

- All Team Captains want to know:
  - Are we ahead or behind schedule?
  - What's the weather?
  - Anyone hurt? Did they get transported? Where?
- You need to be able to communicate out if you have an emergency
- We also need to be able to reach you if there is an emergency at home





# What is looks like on paper



# Your challenges

- Four counties
  - If these four counties were a state, they would be larger than half the states in the U.S.
- Two states
- 6500 square miles
  - Larger than Connecticut, Delaware & Rhode Island combined

# Your challenges

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- Elevations from 470' to 5495'
- About 1/3 of the course has NO cell phone coverage

# Follow Vehicle FRS Radio

- Your Follow Vehicle must have a FRS radio
- Channel 3 / Tone 18
  - Which means you have to have radios that have the tones as well as the channels
- Used to communicate with the near-by follow vehicles
- Used for race officials to talk to you
- NOT for inter-team communications



# Follow Vehicle FRS Radio

- Buy at least two for use only in your follow vehicle
- Look for models that have TONES as well as the different channels
- Radio must accept disposable batteries
  - Most come with rechargeable batteries but there is no way for you to recharge them during the race
  - AA batteries last longer than AAA batteries
  - Carry at least three sets of batteries

# Follow Vehicle FRS Radio

- Headsets are a good idea
  - Allows the passenger to hear over all the other noises, including sound systems
  - If you miss being called, you can be penalized each time you miss a call
- Do not use the VOX (Voice Activated Transmit) function
- “Lock” the radio on Channel 3 / Tone 18
- Radio should be monitored by the passenger, not the driver



Channel  
Number



Alkaline

Tone  
Number



Ni-cad

Lock  
Indicator



# Cell Phones

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- About 2/3 of the racecourse has cell phone coverage
- Varies by carrier
  - Verizon and AT&T have the most coverage

# Cell Phones

- Coverage leaving Baker
- Cell site under construction at Dumont Dunes (near Stages 2 & 3)
- Cell site just below Ibex Pass
- Some coverage around Shoshone
- Generally good coverage around Pahrump
- Lousy coverage east of Pahrump
- Lousy coverage around Mtn Springs
- Good coverage begins around Stage 17



# Team FRS Radios

- Easy, inexpensive option for close-in communications
- Good for talking to your catcher as you approach a checkpoint
- Will not be able to talk very far – no more than to the next stage

# Team FRS Radios

- EVERY team will be assigned a secondary specific FRS Channel and Tone
- Stick with your assigned Channel / Tone to avoid being penalized
- You MUST continue to have a SEPARATE radio in the Follow Vehicle on Channel 3 / Tone 18

# Team FRS Radios

- Ditch the rechargeable batteries and go with disposable batteries
- AA batteries last longer than AAA batteries
  - Multiple sets of batteries per radio
- Headsets are a good idea; exchange points can be noisy
- Figure on multiple radios for all the catchers as well as the team captain and other support personnel

# Team FRS Radios

- Recent FCC rule changes now allow FRS use on some of the GMRS channels
  - Channels 15-22
- However, due to the many requests for GMRS assignments during the race, the FRS use of Channels 15-22 is a rules violation

# GMRS Radios

- So what exactly are channels 15-22 on my FRS radio?
- GMRS means General Mobile Radio Service
- Requires an FCC license
  - \$70 for five years

# GMRS Radios

- Might have slightly higher power than the FRS channels
- Less crowded
- They do make mobile radios (\$)
- You can use a repeater (if you have one) (\$)
- Coordination required



# xRS Radios

- Low power like FRS/GMRS radios
- Uses “Frequency Hopping” technology
  - Avoids interference
  - Allows several users to share the same frequencies
- Coordination required
  - Motorola or TriSquare brands
  - Need the “code”

# xRS Radios



# CB Radio

- Cheap
- Range really varies, but generally further than FRS/GMRS radios
- Coordination required
  - Always the possibility of outside interference by those who don't necessarily play well with others

# CB Radio



# MURS / Business Band Radios

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- Higher power, longer range
- Available in portable and mobile
- No FCC license required for MURS
- Coordination required

# MURS / Business Band Radios





# Rental Radios

- Popular option
- Many companies in both LA area and Las Vegas area
- Some will bring the radios to you on Friday night and retrieve them from you on Sunday
- Handheld equipment similar to MURS/Business Band Radios

# Rental Radios – Trunked System

- Installed by Mobile Relay Associates
- Allows communications across the racecourse and beyond
- Rent through MRA or OMNI
- Handhelds and mobiles

# Rental Radios

*SOME OF THE COMPANIES THAT TEAMS HAVE USED IN THE PAST:*

- OMNI Communications
- Mobile Relay Assoc
- Day Wireless
- Vision Comms
- PCI Race Radios
- Bearcom

# Satellite Phones

- Very expensive
  - Per minute charges on top of rental charges
- Not a lot of success stories
  - It's actually hard to get a signal
  - Satellites are not directly overhead; some are low on the horizon
- Not aware of any team that have rented them two years in a row

# Agency Radios

- Usually a “free” solution
- But it can come with a cost...
- Lose a radio:
  - You can compromise your agency communications
  - You can compromise your agency encryption
  - Do you want to be “that guy” who lost their radio?

# Agency Radios

- Can conflict with licensed agencies along the racecourse
- Running afoul of your agency FCC license
  - Again, do you want to be “that guy” that got your agency in trouble with another agency or the FCC?

# Agency Radios-Frequency Conflicts

Oxnard PD	154.7850	Pahrump Sheriff
Fresno/Clovis	154.9200	CLEMARS mutual aid
AZ Attorney General	155.9100	SB County Fire South Desert VHF Access
Baldwin/Vernon	158.7450	Las Vegas Metro PD Downtown Dispatch
Tulare Sheriff	453.8500	Pahrump Public Works
USC DPS	464.3750	Circus/Circus, Golden Nugget, Meadows Mall
San Jose PD	465.1000	Las Vegas Valley Water District
Santa Barbara PD	465.1000	Las Vegas Valley Water District
Calgary Invitational	868.9875	SB County Fire Mutual Aid
Calgary Women's	868.9875	SB County Fire Mutual Aid

# Agency Radios-FCC License

ULS License

## Public Safety Pool, Conventional License - WNVD228 - SAN JOSE, CITY OF

Call Sign	WNVD228	Radio Service	PW - Public Safety Pool, Conventional
Status	Active	Auth Type	Regular
Dates			
Grant	07/10/2002	Expiration	09/29/2012
Effective	01/06/2011	Cancellation	
Control Points			
1	855 N SAN PEDRO ST, SAN JOSE, CA P: (408)277-5766		
Licensee			
FRN	0004120457	Type	Governmental Entity
Licensee			
SAN JOSE, CITY OF 855 WEST SAN PEDRO STREET SAN JOSE, CA 95110-1718 ATTN GENERAL SERVICES COMMUNICATIONS		P:(408)794-1260 F:(408)297-2534 E:bill.rich@sanjoseca.gov	
Contact			
SPECTRUM RESOURCES EDWARD P TOBIASZ 10525 MIRA VISTA ROAD CUPERTINO, CA 95014-2707 ATTN FCC CONTACT		P:(408)996-8223 F:(408)255-7910 E:fcc@spectrum-resources.com	



# Agency Radios-FCC License

ULS License

Public Safety Pool, Conventional License - WNVD228 - SAN JOSE, CITY OF

## Locations Summary

Call Sign	WNVD228	Radio Service	PW - Public Safety Pool, Conventional
5 Total Locations 10 Locations per Summary Page			
<div>[SC] = Special Condition    [TP] = Termination Pending</div>			
Location	Transmitter Address /Area of Operation	Latitude, Longitude	Status
1 - Fixed	2700 CAROL DR SAN JOSE, CA SANTA CLARA County	37-17-14.8 N, 121-51-56.8 W	
2 - Fixed	SILVER CREEK RD WATER TANK SAN JOSE, CA SANTA CLARA County	37-16-07.8 N, 121-46-32.8 W	
3 - Fixed	855 N SAN PEDRO ST SAN JOSE, CA SANTA CLARA County	37-21-00.8 N, 121-54-19.8 W	
4 - Fixed	2077 AIRPORT BLVD SAN JOSE, CA SANTA CLARA County	37-22-10.8 N, 121-55-45.8 W	
5 - Mobile	56.0 km radius around centerpoint	37-20-15.8 N, 121-53-27.8 W	
5 Total Locations 10 Locations per Summary Page			

In this case, the center of San Jose

In this case, the center of San Jose

# Agency Radios-FCC License



## Federal Communications Commission Public Safety and Homeland Security Bureau

### RADIO STATION AUTHORIZATION

LICENSEE: SAN JOSE, CITY OF

ATTN: GENERAL SERVICES COMMUNICATIONS  
SAN JOSE, CITY OF  
855 WEST SAN PEDRO STREET  
SAN JOSE, CA 95110-1718

Call Sign  
WNVD228

File Number  
0005294227

Radio Service  
PW - Public Safety Pool, Conventional

Regulatory Status  
PMRS

Frequency Coordination Number

FCC Registration Number (FRN): 0004120457

Grant Date	Effective Date	Expiration Date	Print Date
07-03-2012	07-04-2012	09-29-2022	07-04-2012

### STATION TECHNICAL SPECIFICATIONS

#### Fixed Location Address or Mobile Area of Operation

- Loc. 1 Address: 2700 CAROL DR  
City: SAN JOSE County: SANTA CLARA State: CA  
Lat (NAD83): 37-17-14.8 N Long (NAD83): 121-51-56.8 W ASR No.: N/A Ground Elev: 133.0
- Loc. 2 Address: SILVER CREEK RD WATER TANK  
City: SAN JOSE County: SANTA CLARA State: CA  
Lat (NAD83): 37-16-07.8 N Long (NAD83): 121-46-32.8 W ASR No.: N/A Ground Elev: 222.0
- Loc. 3 Address: 855 N SAN PEDRO ST  
City: SAN JOSE County: SANTA CLARA State: CA  
Lat (NAD83): 37-21-00.8 N Long (NAD83): 121-54-19.8 W ASR No.: Ground Elev: 19.0
- Loc. 4 Address: 2077 AIRPORT BLVD  
City: SAN JOSE County: SANTA CLARA State: CA  
Lat (NAD83): 37-22-10.2 N Long (NAD83): 121-53-10.0 W ASR No.: N/A Ground Elev: 15.0
- Loc. 5 Area of operation  
Operating within a 56.0 km radius around 37-20-15.8 N, 121-53-27.8 W,  
SANTA CLARA county, CA

# Ham Radio

- One of the few radio services that are allowed to pick their own frequencies
- A wide variety of equipment
  - Base stations
  - Mobiles
  - Handhelds
  - Repeaters

# Ham Radio

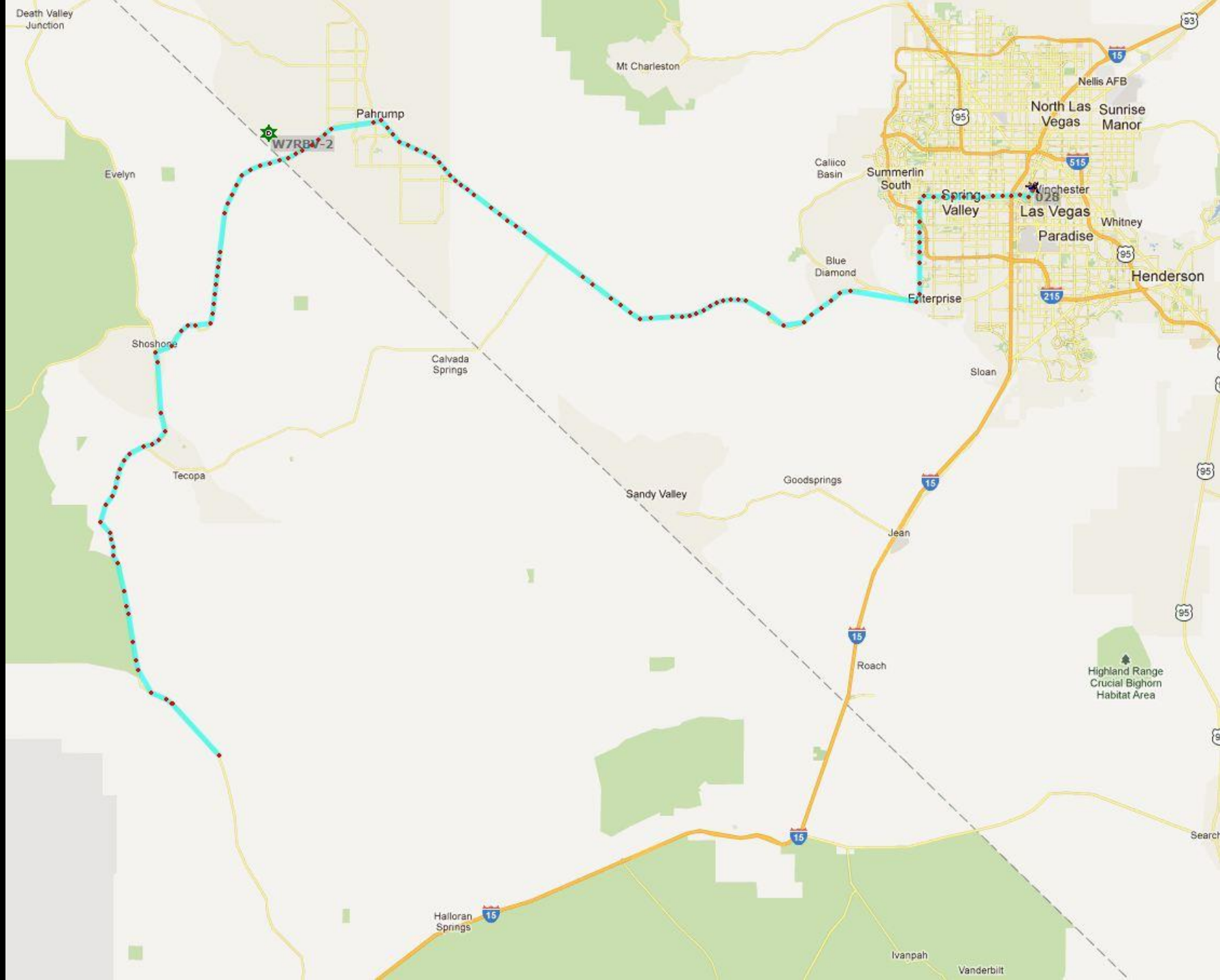
- Where do I find these people?
  - Department RACES/ACS/DCS groups
  - County RACES/ACS/DCS groups
  - CERT
  - Community Amateur Radio Clubs
  - Salvation Army (SATERN)
  - Red Cross
  - Kaiser Permanente

# APRS Tracking

- Using Ham Radio for vehicle tracking
- We set up a complete infrastructure for this tracking network across the racecourse
- We set up a web site that shows the follow vehicle location during the race
  - But you have to be somewhere that has Internet service to see the site
  - Remember that 1/3 of the course has no cell phone ("smart phone" and "air card") coverage

# APRS Tracking

- It would be the team's responsibility to obtain their own tracking device
  - The device has to be under the "control" of a licensed ham radio operator
  - Many of the Ham Radio groups already do APRS tracking and have the equipment



# On-line Communications Form

- Link will be on the web site:
  - [www.bakervegas.com](http://www.bakervegas.com)
- Works on all hardware and software platforms
- Filing period will be  
January 17 – February 14, 2020



# On-line Communications Form

- The key to everything is your team number
- It's not last years team number; they change every year based upon your finish
- Use your department name for your team name; I have to match numbers to departments
- Don't enter "Uber Roadrunners"
- Don't abbreviate: SBCDA = ?

# On-line Communications Form

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- Before you start, you'll need to know:
  - Your Communications Person name, email address, and phone number.
  - If you are filling out this form and will not be able to answer our questions about your communications equipment, list someone who can.

# On-line Communications Form

- Before you start, you'll need to know:
  - The name, and phone numbers for two different people who will answer their phone during the race if we need to deliver an emergency message.
  - This is not your dispatch center back home; these are people who are at the race.

# On-line Communications Form

- Technical information on your radio equipment.
- There is no way to save a partial form, so have your information ready before you make your entry. Please hover over any input box to read the hints for each question on the right side of the screen.

# On-line Communications Form

- To make it easier for 2020:
  - Ham Radio information will be requested on a separate form (ICS205)
  - We will be collecting the technical information on rental radios directly from the rental companies

0% Welcome Page

## 2016 TEAM COMMUNICATIONS FORM

Completion of this form is mandatory for all teams, even if you are not planning on using any communications.

Your form is not complete until you reach the confirmation page with the "SUCCESS" message.

DEADLINE for submission is February 6, 2016.

### BEFORE YOU BEGIN, you need the following information:

1. Your Communications Person name, email address, and phone number. If you are filling out this form and will not be able to answer our questions about your communications equipment, list someone who can.
2. The name and phone numbers for two different people who will answer their phones during the race if we need to deliver an emergency message. This is not your dispatch center back home; these are people who are at the race.
3. Technical information on your radio equipment, including GMRS radios, CB radios, rental radios (including the rental company information), agency radios, ham radios, and APRS tracker radios.

There is no way to save a partial form, so have your information ready before you make your entry.

Please hover your mouse over any input box to read the hints for each question.

Priority will be given to those teams who request the same frequencies they used the previous year.

**Team Number \***

Enter a number between 1 and 299.

**Agency / Team Name \***

Next Page

0% Welcome Page

**There was a problem with your submission.**Errors have been **highlighted** below.

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Please hover your mouse over any input box to read the hints for each question.

Priority will be given to those teams who request the same frequencies they used the previous year.

**Team Number \*****This field is required. Please enter a value.****Agency / Team Name \*****This field is required. Please enter a value.**[Next Page](#)

## 8% Contact Information

**Communications  
Contact Person \***  
First Last**Communications  
Contact Email \*****Communications  
Contact Phone  
Number \*** -  -   
### ### ####

This is the name of the person who can answer our questions about your communications request. If you are renting radios, This is NOT the rental company person. If you are renting radios, enter the person on your team who signed the contract with the rental company.

**Emergency Contacts**

We collect this information because the Communications Group may need to relay responsible party from your team during the race. Please do not list your dispatch center as we need people we can reach at the race.

**Race Weekend  
Primary Emergency  
Contact \***  
First Last**Primary Emergency  
Phone Number \*** -  -   
### ### ####**Race Weekend  
Secondary  
Emergency Contact \***  
First Last**Secondary  
Emergency Phone  
Number \*** -  -   
### ### ####

Will your team have any "base camps" or "communications posts" along the race course? If so, where?



**Will your team have any "base camps" or "communications posts" along the race course? If so, where?**



We use this information in case we need to send a messenger to contact your team.

## B2V2016

**17%** Are You Using Any Communications?

**Is your team using any communications (above and beyond cell phones and/or the FRS radios)? \***

- ☐ Yes  
☐ No

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You **MUST** have an FRS radio on Channel 3 / Tone 18 in your Follow Vehicle. ABOVE AND BEYOND that radio and cell phones, are you using ANY communications?

25% GMRS Radios

Are you using GMRS radios? \*

☒ Yes  
☐ No

If you request GMRS radios, you must provide a copy of a valid FCC GMRS license.

GMRS FCC license call sign \*

WQST365

GMRS first frequency requested \*

462.6500

GMRS first tone requested

100.0

Will you be using a repeater on this first GMRS frequency? \*

☐ Yes  
☒ No

GMRS second frequency requested

462.7000

GMRS second tone requested

100.0

Will you be using a repeater on this second GMRS frequency? \*

☒ Yes  
☐ No

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58% Agency Radios

Are you planning on  
using your agency  
radios during the  
race? \*

☒ Yes☐ No

Agency Radio First  
Frequency \*

Agency Radio First  
Tone

Agency Radio First  
Repeater \*

☐ Yes☒ No

Agency Radio Second  
Frequency

Agency Radio Second  
Tone

Agency Radio Second  
Repeater \*

☒ Yes☐ No

Agency Radio Second  
Repeater Input \*

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67%

Ham Radio

Is your team using  
any ham radio  
communications? \*

☒ Yes

☐ No

Ham  
Communications  
Contact Name \*

First

Last

Enter the name of the  
your ham radio person  
who can answer our  
technical questions.

Ham  
Communications  
Contact Email \*

Ham  
Communications  
Contact Phone \*

###

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## We're Just About Done!

If you are using an existing Amateur Radio system or repeater, you must include a current letter of authorization from the trustee or owner of that system before you will be approved/coordinated for the race. Email your letter to B2V@kf6nxq.net. FAILURE TO SUBMIT A CURRENT SIGNED LETTER IS GROUNDS FOR A TEAM PENALTY. "Recycled" letters from previous years are forbidden.

If you are using any other type of radio communication not already listed (including xRS radios), enter the information here.

An email confirming this form will be sent to the email address you entered for your communications contact person. THIS IS NOT APPROVAL, just an acknowledgement of your submission.

Finally, be sure to review the Communications Rules to avoid penalties and/or disqualification of your team.

**Additional  
Comments /  
Requests**



**Submit**

[Previous](#)


SUCCESS!

You have completed the form. This does NOT constitute approval/coordination, only completion of the form.

# Confirmation Message <no-reply@wufoo.com>

B2V2016

To b2v@kf6nxq.net

 If there are problems with how this message is displayed, click here to view it in a web browser.

You have successfully completed the 2016 Baker to Vegas Communications Form.

This does NOT constitute approval/coordination of your request; it is only an acknowledgement of what was submitted.

If you have changes, please do NOT complete the on-line form again. Email your changes to [B2V@kf6nxq.net](mailto:B2V@kf6nxq.net).

Thank you and good luck to your team!

Jeff Lee  
Communications Coordinator  
Baker to Vegas Challenge Cup Relay

B2V2016

Team Number *	1
Agency / Team Name *	Test
Communications Contact Person *	Jeff Lee
Communications Contact Email *	<a href="mailto:b2v@kf6nxq.net">b2v@kf6nxq.net</a>
Communications Contact Phone Number *	(760) 555-5555
Race Weekend Primary Emergency Contact *	Jeff Lee
Primary Emergency Phone Number *	(760) 555-5555
Race Weekend Secondary Emergency Contact *	Chuck Foote
Secondary Emergency Phone Number *	(760) 555-5555
Will your team have any "base camps" or "communications posts" along the race course? If so, where?	Base Camp in Shoshone
Is your team using any communications (above and beyond cell phones and/or the FRS radios)? *	No



# Confirmation Letter

- After frequency coordination is complete, you will receive a “Confirmation Letter” in the form of a PDF file
- This is what you are “approved” to use, without being penalized
- REVIEW IT and make sure it is accurate
- CONTACT ME if something changes after you receive the letter

2017 Baker to Vegas Challenge Cup Relay  
Frequency Coordination  
February 15, 2017

Team #19 / Riverside Co Sheriff #1  
Communications Contact: Kenneth Guilford

FRS Radio:

You are required to carry a FRS radio set to Channel #3 / Tone #18 in your Follow Vehicle.  
You may use FRS Channel #13 / Tone #3 for team communications if you desire.

GMRS Radio:

Your request for GMRS channel(s) is approved as listed, pending a valid license:  
462.5500 MHz / tone D245 (you will be sharing this frequency with teams 52 & 241)  
462.5750 MHz / tone D245 (you will be sharing this frequency with teams 52 & 241)

CB Radio: You did not request any CB channels.

MURS / Business Band: You did not request any MURS / Business Band frequencies.

Rental Radios: You did not indicate you were renting radios for the race.

Agency Radios: You did not indicate you were using your agency radios for the race.

Amateur Radio:

Your request for amateur radio frequencies is approved as listed:  
446.550 MHz / tone D245 (you will be sharing this frequency with teams 87/241/247)  
446.575 MHz / tone D245 (you will be sharing this frequency with teams 87/241/247)  
449.600- MHz / tone D703 (you will be sharing this frequency with teams 87/241/247)

You need to submit written permission from the repeater trustee.

If you have not already done so, please email an ICS205 Communications Plan to  
b2v@kf6nxq.net before March 10, 2017.

APRS Tracker:

You did not request coordination of any APRS trackers.

NOTE: If your communications plan changes, for example, you make a last-minute decision to rent radios, you MUST email me before the race (b2v@kf6nxq.net) to avoid being penalized.

JEFF LEE  
COMMUNICATIONS COORDINATOR  
BAKER TO VEGAS CHALLENGE CUP RELAY

# ICS 205 Form

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- Only required if your team is using Amateur Radio communications
- Your Amateur Radio people should know what this is and how to fill it out

Baker to Vegas Radio Communications Plan		Team Number & Name Riverside Sheriff - All Teams: #19 Open, #87 Mixed, #241 Women's, #247 Comms		Date/Time Prepared 02/15/2017 - 1200				Operational Period Date/Time 03/25/2017 @ 0700 hours through 03/27/2017 @ 1200 hours	
Ch#	Function	Channel Name/Trunked Radio System Talkgroup	Assignment	RX Freq	RX Tone	TX Freq	Tx Tone	Mode A,D, or M	Location/Remarks
1	Teams 19, 87, 241 & 247 Primary Ibex Pass Repeater	Com1 IBX		462.550	245	467.550	654	A	Repeater located at Ibex Pass Coverage: Legs 1-7
2	Teams 19, 87, 241 & 247 Primary Pahrump Repeater	Com1 PAH		462.550	245	467.550	245	A	Repeater located at Pahrump Com Site Coverage: Legs 8-15
3	Teams 19, 87, 241 & 247 Primary Las Vegas Repeater	Com1 VGS		462.550	245	467.550	654	A	Repeater located on Palms Hotel Coverage: Legs 18-20
4	Teams 19, 87, 241 & 247 Primary Direct	Com1 DIR		462.550	245	462.550	245	A	Course wide simplex
5	Team 19 and 247 Direct	Com2 DIR		462.575	245	462.575	245	A	Course wide simplex
6	Team 241 Direct	Com3 DIR		462.725	245	462.725	245	A	Course wide simplex
7	Team 87 Direct	Com4 DIR		462.700	245	462.700	245	A	Course wide simplex
8	All Teams Alternate Simplex	R-TAC1		446.550	245	446.550	245	M	Course wide simplex Mixed DMR
9	All Teams Alternate Simplex	R-TAC2		446.575	245	446.575	245	M	Course wide simplex Mixed DMR
10	All Teams Repeated - Wide Area Networked	RaceNet		449.600	703	444.600	703	M	Repeated DMR – IP Networked
11									
12									
Prepared by (Communications Unit Leader) Kenneth Guilford K6KEN / WQY2299 (951) 901-5076					Team Command Post Location: Baker in the dirt lot across from Baker H.S. & Shoshone at the SR127 x SR178 intersection.  County: San Bernardino State: CA Latitude: N Longitude: W				

The convention calls for frequency lists to show four digits after the decimal place.

Use "N" for narrowband; "W" for wide band.

Mode refers to either "A" or "D" indicating analog or digital (e.g. Project 25) or "M" indicating mixed mode.

Location/Remark – Latitude and Longitude should be used for field locations. Otherwise enter Hotel/Motel Name.

# The Rules: Chapter 10

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- Get your Communications Form turned in by February 14, 2020
  - 5 minute penalty after February 14, 2020
  - Team not allowed to run race if form not submitted

# The Rules: Chapter 10

- All types of voice communications:
  - Uncoordinated communications – 10 minutes
  - Not complying with coordination – 10 minutes
  - Non “type accepted” equipment – DQ
  - Interfering with any radio system along the course - DQ

# The Rules: Chapter 10

- Ham Radio communications:
  - Using more than 2 frequencies per band – 5 minutes
  - Interfering with existing repeaters – 5 minutes
  - Interfering with coordinated frequencies – 10 minutes
  - Not submitting a frequency plan (ICS205) – 5 minutes

# The Rules: Chapter 10

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- Digital communications:
  - Uncoordinated digital signals – 5 minutes
  - Altering APRS Tracker coordination – 10 minutes



# The Rules: Chapter 10

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- FRS communications:
  - Interfering non-assigned FRS Channel – 5 minutes
  - Interfering on restricted FRS Channel – 10 minutes

# The Rules: Chapter 10

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- Uncoordinated communications:
  - Using uncoordinated radio frequencies or radio systems - DQ

# The Big Picture

- Rule #1: “Keep the boss out of trouble”
- Being a good neighbor
- Lots of moving Communications parts within the race itself:
  - Medical Team
  - Safety Patrol
  - Motors
  - RV Support Group
- 2019: 643 coordinated frequencies in use

# How Not to Label Your Vehicle



# Questions?

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- Jeff Lee
- Communications Coordinator
- B2V@kf6nxq.net