



County of Orange RACES *NetControl*

Newsletter of the County of Orange Radio Amateur Civil Emergency Service

Captain's Corner

by RACES Captain Ken Bourne, W6HK, Chief Radio Officer

Lithium Battery Safety

Included in supplies recommended to be maintained during the COVID-19 pandemic are batteries. Not only should we have a good supply of AA and AAA batteries for our flashlights, TV clickers, etc., but we should also keep batteries charged for our handheld radios, laptops, cell phones, and portable stations. In some cases, that poses a danger.

A few weeks ago, when I was charging the battery for my Yaesu VX-8R handheld radio, I noticed it became unusually hot—too hot to touch. I quickly unplugged the charger to prevent a fire or explosion and moved the battery to a noncombustible surface. I wondered if the cause was the CD-41 charger, which was made in China for Yaesu, or if it was the FNB-102LI 7.4-V, 1800-mAh, 14-Wh, lithium-ion battery pack made in Japan. Fortunately, I had a spare Yaesu battery, the 1100-mAh, 8.2-Wh FNB-101LI. It charged ok, so I concluded that my charger was probably ok and that the FNB-102LI battery had become faulty—and dangerous.

Since that incident, I avoid charging a handheld-radio or laptop lithium-ion battery overnight or when I'm not home. An exception is my cell phone, which I charge overnight on a noncombustible (granite) surface.

Lithium-ion batteries catching fire are nothing new. Newsworthy incidents have occurred on airplanes with exploding headphones and cell phones catching on fire. Hoverboard batteries have been a major issue.

Lithium-ion batteries generally are safe, but are not foolproof, especially when damaged by dropping. If you drop your handheld radio or cell phone, you might issue a sigh of relief if it continues to work, but be aware that you might have damaged your battery and made it dangerous.

OSHA has released important information on lithium battery hazards. Damage to lithium batteries can occur immediately or over a period of time, from physical impact, exposure to certain temperatures, and/or improper charging. Physical impacts that can damage lithium batteries include dropping, crushing, and puncturing. Damage to all types of lithium batteries can occur when temperatures are too high (e.g., above 130°F). External heat sources (e.g., open flames, heaters, etc.) can also accelerate failure in cells with defects or damage from other causes. Damage to lithium-ion batteries can occur when the batteries themselves or the environment around the batteries is below freezing (32°F) during charging. Charging in temperatures below freezing can lead to permanent metallic lithium buildup (i.e., plating) on the anode, increasing the risk for failure. Charging a device or battery without following manufacturer's instructions may cause damage to rechargeable lithium-ion batteries. For example, some manufacturer-authorized chargers will cycle the power to the battery on and off before it is fully charged, to avoid overcharging. Since ultra-fast chargers may not cycle power, do not use them unless the manufacturer's instructions

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**OCRACES
Online Meeting
on Zoom:
Monday, May 4,
2020, at 7:30 PM**

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include them as an option.

OSHA points out that heat released during cell failure can damage nearby cells, releasing more heat in a chain reaction known as a thermal runaway. The high energy density in lithium batteries makes them more susceptible to these reactions. Depending on the battery chemistry, size, design, component types, and amount of energy stored in the lithium cell, lithium cell failures can result in chemical and/or combustion reactions, which can also result in heat releases and/or over-pressurization.

In a lithium-ion battery is a thin and porous slip of polypropylene that keeps the electrodes from touching. If that separator is breached, the electrodes come in contact and become extremely hot. The battery is also filled with a flammable electrolyte. In chemical reactions, by-products from the electrolyte solution and electrodes can increase the pressure in the cell to the point where the cell walls expand and by-products leak out. Chemical by-products usually include carbon monoxide, carbon dioxide, hydrogen, and hydrocarbons. In many cases, the by-products are also combustible and could ignite. In combustion reactions, a thermal runaway releases by-products that may ignite to cause smoke, heat, fire, and/or explosion. The by-products from a lithium battery combustion reaction are usually carbon dioxide and water vapor. In some lithium batteries, combustion can separate fluorine from lithium salts in the battery. If mixed with water vapors, fluorine may produce hydrofluoric acid, which is particularly hazardous.

If your lithium-ion battery is beginning to bulge, its chemicals are probably producing gas, as a result of damage. Consider replacing it permanently, before something tragic happens.

Lithium polymer (LiPo) batteries are also dangerous. On Saturday, March 7, 2020, Tony Long, KC6QHP, plugged in a car jump starter to recharge overnight in his garage. These devices contain a rather large 50-Wh LiPo battery in the case. Tony believes the overcharge protection circuitry failed. After about 7 hours of charging, the cells heated up, ruptured, and burst into flames. He woke up the next morning to insistent knocking at his front door by someone who was driving by and noticed smoke pouring from his garage. Tony called 911, and the Redondo Beach Fire Department arrived quickly, but too late to save nearly all of his RF test equipment and 24-GHz radio that were stored in his garage. He advises never to leave LiPo batteries charging unattended.

A lithium polymer battery is a rechargeable battery of lithium-ion technology using a polymer electrolyte instead of a liquid electrolyte. High conductivity semisolid (gel) polymers form this electrolyte. These batteries pro-

vide higher specific energy than other lithium battery types and are used in applications where weight is a critical feature.

Just as with other lithium-ion cells, LiPos work on the principle of intercalation and de-intercalation of lithium ions from a positive electrode material and a negative electrode material, with the liquid electrolyte providing a conductive medium. To prevent the electrodes from touching each other directly, a microporous separator is in between, which allows only the ions and not the electrolyte particles to migrate from one side to the other.

The voltage of a LiPo cell depends on its chemistry and varies from about 2.7 to 3.0 V (discharged) to about 4.2 V (fully charged), for cells based on lithium-metal-oxides (such as LiCoO_2); this compares to 1.8 to 2.0 V (discharged) to 3.6 to 3.8 V (charged) for those based on lithium-iron-phosphate (LiFePO_4).

The exact voltage ratings should be specified in product data sheets, with the understanding that the cells should be protected by an electronic circuit that won't allow them to overcharge nor over-discharge under use. That circuit may have failed in Tony's case.

For LiPo battery packs with cells connected in series, a specialized charger may monitor the charge on a per-cell basis so that all cells are brought to the same state of charge (SOC).

After hearing about Tony's experience via the San Bernardino Microwave Society's e-mail list, Doug Millar, K6JEY, asked whether it was a Bioenno lithium iron phosphate (LiFePO_4) or a regular LiPo battery. In the e-mail string, Kevin Zanjani, KI6DHQ, responded that Tony's battery was a lithium polymer jump starter. They are not stable. He said the Bioenno LiFePO_4 battery is ultra stable with a battery management system (BMS) function using cylindrical cells. Kevin mentioned that lithium polymer batteries for car jump starters have problems when the polymer stack can short out. Usually this happens when the unit was dropped on a hard surface a few times.

LiFePO_4 (lithium iron phosphate) or LFP (lithium ferrophosphate) batteries use a new type of cathode material that provides several advantages over traditional Li-ion batteries based on LiCoO_2 . LiFePO_4 batteries provide much higher specific capacity, superior thermal and chemical stability, enhanced safety, improved cost performance, enhanced charge and discharge rates, compact size, light weight, and enhanced cycle life. LiFePO_4 batteries can offer a cycle life of potentially 2,000-3,000 charge cycles. Typical LFP batteries have an average lifetime of between 5 to 10 years and can be expected to deliver reliable and consistent performance throughout their service life.

May 4th OCRACES Meeting to Be on Zoom

Due to the COVID-19 pandemic and Sheriff's Department orders to stand down on all RACES activities outside the home, the next OCRACES meeting will be online, using Zoom. A test Zoom meeting was held successfully on Monday, April 20, 2020, at 7:30 PM, hosted by Joe Selikov, KB6EID, on his Zoom Pro account, with 11 OCRACES check-ins plus OCSO Emergency Communications Coordinator Peter Jimenez, KI6UTE. The next OCRACES Zoom meeting will be on Monday, May 4th, at 7:30 PM, with the meeting ID and password sent to the mailing lists for OCRACES members and city RACES and MOU officers and selected members. Joe will once again be the meeting host. Everyone who wishes to participate should download and install the Zoom software at <https://zoom.us>. The "Basic" plan is free.

No Sheriff's Department business will be conducted during OCRACES Zoom meetings, due to security concerns. Zoom meetings are for socializing only, such as discussing amateur radio technical projects and on-the-air activities. We will not discuss activation policies and procedures, EOC RACES equipment, etc.

Portable Drill to Replace ACS Radio Rodeo

ACS Radio Rodeo, which was planned for Saturday, May 2, 2020, has been canceled due to the COVID-19 pandemic and Sheriff's Department order to cancel all RACES outside group activities until further notice. However, we can't let a perfectly good Saturday go to waste! On May 2nd, we will conduct a limited City/County RACES & MOU Portable Drill. Members will operate portable stations from their own property (such as their backyard), using battery power and portable antennas. From 0900 to 1000 hours, operations will be on the 146.595 MHz OCRACES simplex frequency. Net control will be OCRACES Chief Radio Officer Ken Bourne, W6HK, using his home station and high-gain chimney-mounted antenna, so that he can hear calls from much of Orange County. Relay stations will be appointed throughout the county, so that even low-power handheld radios should be able to check in. Ken will begin the drill by calling for check-ins from cities in alphabetical order, then from MOUs, and finally from OCRACES members.

Beginning at 1000 hours, Ken will incorporate the Portable Drill into the normal Saturday morning 60-meter OCRACES ACS net on 5371.5 kHz USB ("channel 4" dial frequency). This net covers the 11 counties in the Cal OES Southern Region plus northern Arizona and southern Nevada. Home stations may check in, but portable operation is preferred (using battery power and portable antennas such as Hamsticks, end-fed wires, etc.). Ken will also operate from his home station for this net, using a 102-foot G5RV antenna up about 35 feet. At the conclusion of the net, time permitting, Ken will move his operation to a low-power portable station in his backyard, using a Hamstick dipole up about 9½ feet on a tripod mast. The 60-meter net and overall drill will conclude at 1100 hours.

Nationwide Red Cross Drill: May 30th

Brian McDaniel, N4AE, Executive Director, American Red Cross of the Illinois River Valley, mentioned in the *ARES E-Letter* for April 15, 2020, that amateur radio operators affiliated with the American Red Cross will conduct a nationwide communication drill on May 30th. The drill will simulate the types of message traffic that is typical of a national disaster response, such as a hurricane or wildfire. Hams will utilize digital modes to move a variety of Red Cross data, with special focus given to methods that do not require infrastructure such as a repeater or the internet. The drill features a local option where ARES organizations can work with local Red Cross Chapters to drill local and regional functionality. For more info, contact Rhode Island Section Emergency Coordinator [Paul Silverzweig, W1PJS](#).

Welcome Back: Fran Needham, KJ6UJS

County of Orange RACES has always had a policy that members are not allowed to belong to more than one RACES unit, to avoid conflicts during simultaneous activations. After careful consideration, that policy has now been relaxed. OCRACES members may now belong to another RACES unit or an MOU organization, provided that they give first priority to OCRACES during activations. Because of our policy relaxation, Fran Needham, KJ6UJS, is rejoining OCRACES, while continuing his membership in City of Orange Amateur Radio (COAR, the city's RACES unit). Fran has a close relationship with both OCRACES and COAR and has worked with COAR on several projects. We are glad that Fran will be able to continue serving the City of Orange's excellent RACES unit, while contributing his valuable services once again to OCRACES.

Cleaning and Disinfecting During Pandemic

The following information on cleaning and disinfecting is provided by the Centers for Disease Control and Prevention (CDC). Wear disposable gloves to clean and disinfect.

Clean surfaces using soap and water. Practice routine cleaning of frequently touched surfaces. High-touch surfaces include tables, doorknobs, light switches, countertops, handles, desks, phones, keyboards, radios, toilets, faucets, sinks, etc.

To disinfect, first clean the area or item with soap and water or another detergent if it is dirty. Then use disinfectant (EPA-registered household disinfectant recommended). Follow the instructions on the label to ensure safe and effective use of the product. Many products recommend keeping the surface wet for a period of time (see product label) and precautions such as wearing gloves and making sure you have good ventilation during use of the product. Diluted household bleach solutions may also be used if appropriate for the surface. Check the label to see if your bleach is intended for disinfection, and ensure the product is not past its expiration date. Some bleaches, such as those designed for safe use on colored clothing or for whitening, may not be suitable for disinfection. Unexpired household bleach will be effective against coronaviruses when properly diluted. Follow the manufacturer's instructions for application and proper ventilation. Never mix household bleach with ammonia or any other cleanser. Leave the solution on the surface for at least 1 minute. To make a bleach solution, mix 5 tablespoons ($\frac{1}{2}$ cup) bleach per gallon of water or 4 teaspoons bleach per quart of water. Alcohol solutions with at least 70% alcohol may also be used.

For soft surfaces such as carpeted floor, rugs, and drapes, clean the surface using soap and water or with cleaners appropriate for use on these surfaces. Launder items (if possible) according to the manufacturer's instructions. Use the warmest appropriate water setting and dry items completely. Otherwise, disinfect with an EPA-registered household disinfectant that meets EPA's criteria for use against COVID-19.

For electronics such as tablets, touch screens, keyboards, remote controls, ATM machines, and amateur radio communications equipment, consider putting a wipeable cover over the product. Follow manufacturer's instruction for cleaning and disinfecting. If no guidance, use alcohol-based wipes or sprays containing at least 70% alcohol. Dry the surface thoroughly.

For clothing, towels, linen, and other laundry items, launder items according to the manufacturer's instructions. Use the warmest appropriate water setting and dry items completely. Wear disposable gloves when handling dirty laundry from a person who is sick. Dirty laundry from a person who is sick can be washed with other people's items. Do not shake dirty laundry. Clean and disinfect clothes hampers according to guidance above for surfaces. Remove gloves and wash hands right away.

Cleaning and Disinfecting Your Home (or Other Facility) if Someone Is Sick

Close off areas used by the person who is sick. Open outside doors and windows to increase air circulation in the area. Wait 24 hours before you clean or disinfect. If 24 hours is not feasible, wait as long as possible. Clean and disinfect all areas used by the person who is sick, such as offices, bathrooms, common areas, shared electronic equipment like tablets, touch screens, keyboards, remote controls, radios, and ATM machines. If more than 7 days since the person is sick visited your home or used the facility, additional cleaning and disinfection is not necessary. Continue routine cleaning and disinfection.

When Cleaning

Wear disposable gloves and gowns for all tasks in the cleaning process, including handling trash. Additional personal protective equipment (PPE) might be required, based on the cleaning/disinfectant products being used and whether there is a risk of splash. Gloves and gowns should be removed carefully to avoid contamination of the wearer and the surrounding area. Wash your hands often with soap and water for 20 seconds. Always wash immediately after removing gloves and after contact with a person who is sick. If soap and water are not available and hands are not visibly dirty, an alcohol-based hand sanitizer that contains at least 60% alcohol may be used. However, if hands are visibly dirty, always wash hands with soap and water. Additional key times to wash hands include: after blowing one's nose, coughing, or sneezing; after using the restroom; before eating or preparing food; after contact with animals or pets; and before and after providing routine care for another person who needs assistance (e.g., a child).

Cooperative T-Hunts Canceled

Cooperative T-hunts, which are normally held on third Mondays following the OCRACES 2-meter net, have been canceled, due to the COVID-19 pandemic and orders from Sheriff Barnes and Governor Newsom to stay sheltered at home. All Orange County RACES outside group activities are canceled until further notice. Although the cooperative T-hunts are not official RACES activities (anyone can participate), OCRACES nevertheless promotes the hunts and therefore has canceled them.

Field Day Might Be at Home Only

Field Day, scheduled for June 27-28, 2020, is iffy, due to the COVID-19 pandemic. Dr. Deborah Birx, the White House Coronavirus Task Force coordinator, said that, while the coronavirus trends give her “great hope” for slow re-openings over the next few months, many of the social-distancing measures that have upended American life will be a constant fixture throughout the summer. Birx said the U.S. needs a “breakthrough” on coronavirus testing to help screen Americans and get a more accurate picture of the virus’ spread. Birx said the task force intends to continue working with states to scale up testing for those sick with the virus. “At the same time,” she added, “we have to realize that we have to have a breakthrough innovation in testing” for those who have already had the virus but had either mild or no symptoms. Birx said that current diagnostic testing, which tests a sample from someone’s nose or mouth for evidence of the live virus, can “carry us through the spring and summer.” These remarks and the requirement for continued social distancing make Field Day seem unlikely for this June, at least in the tradition where groups work closely together to set up and operate Field Day stations.

This unprecedented situation might be an opportunity for RACES units to try something new for Field Day, employing a new approach that is in line with current circumstances. Social distancing and Orange County and State of California requirements will impact how—and even whether—we are able to participate in Field Day this year. ARRL, which sponsors Field Day, continues monitoring the coronavirus situation, paying close attention to information and guidance offered by the Centers for Disease Control and Prevention (CDC). If social distancing means that Class A with a 30-member team set up in a park won’t work this year, then it’s time for a Plan B. Part of the Field Day concept has always been adapting our operation to the situation at hand. At its heart, Field Day is an emergency communication demonstration. Field Day rules are flexible enough to allow individuals and groups to adjust their participation and strategies in a way that still addresses their needs while being fun. Some possibilities:

- Encourage members to operate from their home stations on emergency power (Class E)
- Use our repeaters as a means for individual participants to keep in touch during the event
- Set up a portable station in each participant’s back yard

Public visibility and interaction with visitors has always been a part of Field Day, which will be impacted this year. Local and served agency officials will not visit, but we should keep them informed of our activities, since Field Day gives us practice in serving them during future disasters. We should also seek their advice and guidance in conducting this and other emergency communications exercises.

Accessing COVID-19 Information Sources

For the latest news related to COVID-19 in Orange County, visit <https://occcovid19.ochealthinfo.com>. You may also text “OCCOVID19” to 888777 to subscribe to updates and resources related to COVID-19. The Orange County Hotline at 833-426-6411 is for all inquiries related to COVID-19.

Zoom Meetings Require Security Precautions

During the COVID-19 pandemic, OCRACES will conduct its meetings via Zoom videoconferencing, rather than at the usual Eckhoff Street location. Furthermore, no RACES members are to enter the Loma Ridge facility at this time, nor engage in any RACES activities outside the home. Due to security concerns, no Sheriff’s Department business will be discussed during Zoom online meetings.

Zoom is an American company with an American CEO, but part of its server infrastructure is in China. Loopholes have allowed trolls to insert pornographic videos, profanity, and racism into city council meetings, high-school classes, and other online meetings throughout the U.S. As a result, the San Jose company is updating its software and educating users on how to secure their meetings, but the system is not foolproof. The company has increased security measures to reduce problems, enabling virtual waiting rooms and letting only meeting hosts share their screens by default. However, city council meetings in Los Angeles County and Orange County were “Zoom-bombed” on March 27th and 31st.

A Zoom videoconference can now be switched to webinar mode, whereby only selected participants whose turn it is to speak can share audio and video. Some city councils, to reduce the possibility of “Zoom-bombing,” are limiting their Zoom meetings to audio only.

Security measures will be followed in OCRACES meetings, which will be for socializing only. Activation procedures will not be discussed. That’s ok, because we are concerned about our fellow county and city RACES and MOU members during this COVID-19 pandemic. Checking up on each other during Zoom meetings shows we care and boosts morale.

RACES/MOU News from Around the County

"RACES/MOU News" provides an opportunity to share information from all City & County RACES/ACS units and MOU organizations and supportive amateur radio clubs in Orange County.

Please send your news to NetControl Editor Ken Bourne, W6HK, at:

kbourne.ocsd@earthlink.net

Westminster RACES

Adam Valek, N6HVC, has been appointed Westminster RACES Acting Chief Radio Officer. The new City RACES Coordinator is Sgt. Ron Weber of the Westminster Police Department.

Orange County Hospital Emergency Amateur Radio Team (OCHEART)

OCHEART has expanded its website into a showcase of its capabilities. Be sure to visit <https://ocheart.net>.

Orange County SKYWARN

On Monday, April 6, 2020, at 8:00 AM, Orange County SKYWARN Coordinator Scott O'Donnell, WX6STO, announced that the National Weather Service in San Diego requested activating SKYWARN for critical weather reports. Flooding and heavy rainfall measurements in a short amount of time were requested.

NWS issued a Flash Flood Warning from 10:23 AM to 1:30 PM for Orange County.

SKYWARN spotters were asked to send their reports via the Web at <https://inws.ncep.noaa.gov/report/>. These reports were immediately displayed on the forecasters' computer screens. Spotters could also call in their reports on a hotline number.

Reports consisted of:

- Rain and flooding (amount of rain in a given time, urban streets, ponding of water in low-lying areas or poor drainage, flash flooding, threats to life or property or disrupting traffic)
- Wind (gusts greater than 40 mph and all wind-related damage, including trees and power poles down)
- Tornadoes, funnel clouds, waterspouts, or any rotating cloud, plus confirmed injuries or damage
- Photos, including day/time and specific location

Scott deactivated Orange County SKYWARN at 7:46 PM

At 12:09 PM on Tuesday, April 7th,

Scott activated Orange County SKYWARN again, until 8:00 PM, per an NWS San Diego Areal Flood Advisory. He deactivated SKYWARN at 8:09 PM, and advised spotters that another activation was planned for Wednesday, April 8th, at 8:00 AM. Deactivation was announced at 5:06 AM on Thursday, April 9th, and spotters were advised of a reactivation at 3:00 PM, with active weather possibly lingering well into Thursday night. Another activation was declared on Friday, April 10th, at 5:00 AM. Scott deactivated OC SKYWARN at 7:36 PM.

San Bernardino Microwave Society (SBMS)

SBMS has canceled this year's running of the 2 GHz and Up Contest and Club Challenge, which would have been held May 2-3, 2020. This event and others like it are enabled by and thrive on mountaintop activations and rovers, many of which will not be possible this year due to COVID-19 related closures and local shelter-in-place and similar ordinances. As the situation is still worsening and unpredictable, SBMS does not want to encourage operators to take unnecessary risks in support of this competition. Where possible, local groups may have abbreviated home-to-home activities, but these will be off-the-record for purposes of the official SBMS competition. SBMS President Courtney Duncan, N5BF, said, "We all hope and pray that the regional, national, and worldwide situation will improve as we get into the summer and we hope we are able to see you all back in the field and on the air in the August and September ARRL competitions and on into 2021."

Orange County Fair

Over the years, RACES members have attended the Orange County Fair. During some years, an amateur radio booth was shared with OCRACES. This year's Fair, which was scheduled to run July 17 through August 16, has been canceled because of ongoing concerns about the coronavirus and uncertainty over when the state may lift its ban on large events.

May 2020

Sun	Mon	Tue	Wed	Thu	Fri	Sat
					1	2 Portable Drill & Weekly 60 m ACS Net
3	4 Weekly 2 m ACS Net & OCRACES Zoom Meeting	5	6	7	8	9 Weekly 60 m ACS Net
10	11 Weekly 2 m ACS Net	12	13	14	15 Orange County Amateur Radio Club Meeting (Zoom?)	16 Weekly 60 m ACS Net
17	18 Weekly 2 m ACS Net (no T-hunt)	19	20	21	22	23 Weekly 60 m ACS Net
24	25 Memorial Day (no nets)	26	27	28	29	30 Weekly 60 m ACS Net
31						

Upcoming Events:

- **May 2:** City/County RACES & MOU Portable Drill, 0900-1000 hours on 146.595 MHz simplex and 1000-1100 hours on 60 meters channel 4
- **May 4:** OCRACES Meeting on Zoom, 1930 hours
- **May 15:** Orange County Amateur Radio Club (OCARC) Meeting, 1900 hours, American Red Cross (George M. Chitty Building), 600 Parkcenter Drive, Santa Ana, or (more likely) on Zoom
- **May 18:** Cooperative T-hunt, **CANCELED**
- **May 25:** Memorial Day (no nets)
- **June 8:** City/County RACES & MOU Meeting, 1930 hours, 840 N. Eckhoff Street, Suite 104, Orange (cancellation possible)
- **June 27-28:** Field Day (cancellation possible)



<https://ocraces.org>



Mission Statement

County of Orange RACES has made a commitment to provide all Public Safety departments in Orange County with the most efficient response possible to supplement emergency/disaster and routine Public Safety communications events and activities. We will provide the highest level of service using Amateur and Public Safety radio resources coupled with technology, teamwork, safety, and excellence. We will do so in an efficient, professional, and courteous manner, accepting accountability for all actions. We dedicate ourselves to working in partnership with the Public Safety community to professionally excel in the ability to provide emergency communications resources and services.

County of Orange RACES Frequencies

60 m: 5371.5 kHz USB (dial) (Channel 4) (OC ACS Net—Saturdays, 1000 hours)
 40 m: 7250 kHz LSB
 10 m: 29.640 MHz output, 29.540 MHz input, 107.2 Hz PL (out of service)
 6 m: 52.620 MHz output, 52.120 MHz input, 103.5 Hz PL
 2 m: 146.895 MHz output, 146.295 MHz input, 136.5 Hz PL*
 2 m: 146.595 MHz simplex
 1.25 m: 223.760 MHz output, 222.160 MHz input, 110.9 Hz PL (out of service)
 70 cm: 446.000 MHz simplex
 70 cm: 448.320 MHz output, 443.320 MHz input, 141.3 Hz PL (private)
 70 cm: 449.100 MHz output, 444.100 MHz input, 110.9 Hz PL (private)
 70 cm: 449.180 MHz output, 444.180 MHz input, 107.2 Hz PL (private)
 70 cm: 449.680 MHz output, 444.680 MHz input, 131.8 Hz PL (private)
 23 cm: 1287.650 MHz, 1287.675 MHz, 1287.700 MHz, 1287.725 MHz, 1287.750 MHz, and 1287.775 MHz outputs, -12 MHz inputs, 88.5 Hz PL
 *Primary Net—Mondays, 1900 hours

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It's Where It's @!

Questions or Comments?
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**“W6ACS ...
Serving
Orange County”**

Meet Your County of Orange RACES Members!

Officers →



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KC6MMF

Jack Barth
AB6VC

Ernest Fierheller
KG6LXT

Bob McFadden
KK6CUS

Tom Tracey
KC6FIC



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