August 2021

County of Orange RACES
NetControl

Newsletter of the County of Orange Radio Amateur Civil Emergency Service

OCRACES Online Meeting on Microsoft Teams:

Monday, August 2, 2021, at 7:30 PM

Orange County Sheriff's Department
Emergency Management Division

CRO's Nest
by Ken Bourne, W6HK, OCRACES Chief Radio Officer

Drones in RACES

Is there a future for drones in RACES? It's something to think about. Since the COVID-19 pandemic began, drones have had an increasing role in emergency response efforts, in accessing hard-to-reach areas, spraying disinfectants in public areas such as arenas, and tracking crowds to assist authorities in maintaining group size and distancing.

Drones are being used to deliver crucial medical aid and test kits, while minimizing interaction between groups of people. If future outbreaks of the pandemic occur, drones will assist even more. Cellular-connected drones might be used for quick delivery, such as to transport prescriptions from pharmacies to homes, collect samples for drop-off at laboratories, provide medical equipment and devices to people at remote locations, shuttle blood from blood banks to hospitals, and work with all levels of the health system.

Some RACES members are experimenting with drones and are thinking about how to use them during emergencies. Eventually, from a keyboard, they can configure a flight, walk to the drone, and place an item—perhaps a portable transceiver or repeater—and have it arrive minutes later at a critical location. A payload-capable drone would be required, with advanced control and navigation software, and a compact IoT gateway providing a secure and reliable drone-to-cellular connection. If, during an emergency, cellular systems fail, perhaps hams will have developed a drone-to-UHF or microwave connection. Perhaps that is far-fetched, and more prob-

able is a drone-to-5G-network connection. The next-generation cellular network can enable more data to be transferred at near-zero latency. Drones eventually will use artificial intelligence (AI) applications via the cloud.

RACES and SKYWARN might use drones to monitor the weather and to check communities for storm damage (such as down powerlines), relaying the information in real time, along with images, to the EOC or to first responders.

Researchers in Europe are working on a system to locate victims, using a drone, a cellphone, and AI. The drone is equipped with a portable cellular base station and sent over a specific area, detecting signals from phones in that area. The drone then finds the location of the phone and sends it back to the rescuers. Normally, three cell towers are used to locate a phone by triangulation. But a drone and its portable "cell tower" can move to three or more locations and triangulate the signal for pinpointing the exact location. During a disaster, if cell towers are disabled, this system would still work for locating victims or could even substitute as a makeshift cellular network.

The same principal could be used to locate radio interference or a RACES member lost in a wilderness area. It would be equipped with a remotely programmable receiver tuned to the frequency of interest and a directional antenna. On a coordination frequency, the drone would transmit the antenna bearing and the drone's location (using data from its onboard GPS receiver) to a central computerized monitor-

CRO's Nest *Continued from page 1*

ing point. Imagine having an elaborate T-hunt (fox hunt) using this technology!

A simple use of a drone in amateur radio is to inspect a tower-top antenna installation or tower damage from wind or corrosion, without climbing the tower (except, of course, to repair discovered damage). The drone's camera supplies more detail than binoculars, and from all angles around and above the tower and antennas.

Events such as Field Day are enhanced by drone pictures and videos. Many drones use autopilot systems that interpret your commands (throttle, yaw, pitch, etc.) and splice that with input from various sensors to maintain altitude as well as position, regardless of wind. Most gimbal-equipped drones let you adjust the pitch (pointing straight ahead or down) of the camera, to capture great footage. The gimbal gets inertial measurement unit (IMU) data—representing the complete velocity and orientation of the drone from various sensors, including an altimeter, accelerometer, and gyro—from the autopilot system to determine how to best position the camera with a combination of instant pan, tilt, and roll adjustments.

Half-wavelength HF dipole antennas supported by ropes in trees are popular with hams. These antennas are commonly used during Field Day. Getting a pilot line (for hauling up a heavier guy rope) over a tall tree branch is sometimes achieved by throwing a tennis ball with an attached light line, or using a sling shot or bow and arrow. A drone could be more effective, but care must be taken not to snag the line in the tree, thus hanging the drone out of reach. It would be best to fly the drone to at least twice the height of the tree and drape the line over tree, rather than pulling the line through the tree. The drone should have propeller guards, to avoid contacting the line on the way down.

A drone could assist with raising an HF antenna at a field location during an emergency. Hams have used drones for hanging wire and even Yagi antennas from a high tree branch. One example is a drone that was used for an amateur lift, carry, and drop application. Its open-source operating code was written around the Arduino processor. The code was written so certain I/O functions could be modified by changing parameters in the setup software—hence no actual new code needed to be written and compiled.

Radio amateurs have hoisted vertical wire antennas with kites and helium-filled balloons, and are now doing the same with drones. Of course, these are not permanent installations, but are useful for short-duration contacts with impressive signal strength. For example, a ham might want to try for unusual DX contacts on 160 meters (about 1900 kHz) at sunrise or sunset, when propagation might be enhanced. A half-wave vertical wire hung from a drone would be about 250 feet long, and could be quite effective. A drone with suitable lifting power for the wire gauge and length should be able to keep the wire vertical, except during fierce Santa Ana winds.

Many radio amateurs experiment with antennas, and some take measurements to verify their performance as predicted by antenna models (such as EZNEC) or other specifications. An important parameter is the antenna's radiation pattern. A drone will help to determine if the antenna is correctly constructed and adjusted to produce the desired pattern. It will also show nearby metallic objects (such as a Yagi-loaded tower) that could distort the omnidirectional pattern of a vertical antenna.

To measure a radiation pattern, a small transmitter with a short wire antenna could be hung from a drone flying in a precise circular course around the antenna under test. The distance and height are both variables. The distance would be selected to move out of the near field, and the height would be selected for various take-off angles. The test antenna on the ground would drive a receiver or detector with the signal level led to a computer. Software on the computer would combine the transmitter location data from the drone's telemetry with the signal-level data and create a pattern slice similar to what is produced by the modeling programs. If the test antenna rotates, the drone could be at a fixed position. In the past, antenna pattern measurements were accomplished with a military helicopter and were an expensive operation. Now with drones, radio amateurs can do something similar at an affordable price.

When equipped with an amateur radio transceiver, a drone must be operated in accordance with FCC rules. But the pertinent government agency is really the Federal Aviation Agency (FAA). Drones should not fly above 400 feet and should not be within 3 miles of an airport. Depending on local laws, you need to get approval of anyone appearing in your drone's video. Safety is of prime consideration. In the case of radio or electronic failure, what happens if you lose control of your drone and it flies into a crowd of people or damages property? I recall a member of a city RACES unit telling me a few years ago that he was watching a drone fly over some swimmers at a beach. Unfortunately, the drone kept going...and going...and going...out over the ocean, until it was out of site and out of radio coverage of the person trying to control it. Luckily, it did not crash into a swimmer, but I heard about a drone that crashed into a group of Boy Scouts and caused serious injuries. It's rare to lose a drone flying out of range. Some GPS-enabled drones will record their home position before takeoff. If the control signal is lost, it will fly back home and land safely Drones can be useful tools in amateur radio and RACES, but they are dangerous if not flown carefully and responsibly.

VHF Low Band Channels in Orange County
by Robert Stoffel, KD6DAQ

As RACES members, we are sometimes called upon to operate on public-safety radio channels, either from the Loma Ridge EOC, or in the field with the Control 7 communications response vehicle (right photo). In this continuing series, I am sharing information about these radio systems and channels, providing our members with a better understanding on what they are and how they are used here in Orange County.

Peter Jimenez, KI6UTE, stands in front of Control 7 at the 2019 Radio Rodeo.

This month, we take a look at VHF Low Band, and the channels that RACES members may be asked to monitor or transmit on. Of all the public-safety radio bands, we have the fewest channels in VHF Low Band. In fact, RACES members only need to know about three VHF Low Band channels, known as OA-1, OA-2, and LLAW1.

OA-1 and OA-2 are a part of the Operational Area (OA) Radio System. This system was established for communications between Emergency Operations Centers (EOC) in Orange County. This system is used primarily for dissemination of information from the County/OA EOC at Loma Ridge to all participating City, County, and Operational Area EOCs. It may also be used as a backup mode of communication between the EOCs when normal methods of communication are disabled. For example, if telephones, the internet, fax machines, email, and other ways we normally communicate are lost, this simplex radio system will still be available to communicate information amongst the EOCs.

When RACES members are working in the radio room at Loma Ridge during an EOC activation, we are always tasked with monitoring and transmitting messages over OA-1 and OA-2. To help alleviate channel overload, users are permanently assigned to either OA-1 or OA-2. OA-1 contains City EOCs, County agencies, colleges, and universities. OA-2 is primarily K-12 school districts. This radio system is used to share information from the County/OA EOC to the Operational Area during an EOC activation, by transmitting various informational messages. RACES members transmit these messages when they are released by the OA.

Orange County operates one VHF Low Band channel for interoperable communications with agencies that use VHF Low Band as their primary radio system. This channel is called LLAW1 (pronounced "L-Law-One"). This nationwide, repeated, Law Enforcement interoperability channel is primarily used for communications with the California Highway Patrol, as they are the only local agency that uses VHF Low Band for day-to-day communications. The LLAW1 radio channel is programmed into all CHP mobile radios statewide. Control One is able to electronically connect the LLAW1 radio channel to any conventional radio channel or any 800 MHz Countywide Coordinated Communications System (CCCS) talkgroup, allowing for communications between users of the LLAW1 channel and the 800 MHz CCCS. The electronic connecting of channels is referred to as "a patch." While RACES personnel would not be tasked with implementing the patch, we may be asked to monitor this radio channel for a specific situation or incident being supported by the EOC or in the field with Control 7.

That completes our look at the VHF Low Band channels. Next month we will continue our journey by taking a look at the VHF High Band.

OC Deputy Sheriff Uniform Bottle Coolie

The Orange County Sheriff's Museum & Education Center is now offering a bottle coolie that is an accurate replica of the current Orange County Sheriff's Department's Deputy uniform. It fits and insulates hot or cold bottled drinks. The price is $10.00 each (tax included). A 10% discount is available for orders over five pieces. Shipping is $5.00 to CONUS addresses. Cash, checks, or PayPal is accepted. Checks should be made out to the Orange County Sheriff's Museum and mailed to OCSM&ED, P.O. Box 221, Los Alamitos, CA 90720. For online purchases, visit the Sheriff's Museum website Store page at http://ocsheriffmuseum.com/store.html.

COVID-19 Still Rages in Orange County

With the COVID-19 delta variant surging, we are still not sure when the EOC at Loma Ridge will be open to card access by all OCRACES members or when we will be able to meet in person at the EOC. For now, we will continue holding our meetings online via Microsoft Teams.

County facilities are returning to a mandatory mask policy. The Orange County Superior Courthouse in Santa Ana did that on Monday, July 26, 2021, for all employees and visitors, regardless of vaccination status, after two people in the building tested positive for the coronavirus. The change is in line with guidance from numerous state and county health agencies. It is meant to prevent those coming and going from the building, and everyone they subsequently come into contact with, from spreading the virus. The order will expire in two weeks from July 26th if no new cases are reported at the courthouse. But it could be extended if officials learn of another person testing positive for the virus who may have been in the building during that time.

Current data in Orange County shows that unvaccinated individuals are over six times more likely to become infected with COVID-19 than those who are fully vaccinated. Between July 15 and July 21, the county experienced an increase in the seven-day average case rate, from 2.95 to 6.1 per 100,000 people, with the average number of daily COVID-19 cases increasing from 121 to 209. The positivity rate also increased from 2.2 percent to 4 percent, and hospitalizations jumped from 119 to 149 per day.

The Orange County Health Care Agency reminds those who experience COVID-19 symptoms to get tested, regardless of their vaccination status. Self-collection, at-home COVID-19 test kits can be ordered at no cost by visiting https://occovid19.ochealthinfo.com/covid-19-testing.

Individuals seeking information about the COVID-19 vaccines are encouraged to follow credible sources to learn more about their benefits, safety, and effectiveness. The World Health Organization, for example, recently updated a list of questions and answers (Q&A) to address COVID-19 vaccine safety. Other sources include the Centers for Disease Control and Prevention, the CDPH, the Food and Drug Administration, and the American Academy of Pediatrics.

Orange County COVID-19 case counts and testing figures are updated daily, Monday through Friday, at https://occovid19.ochealthinfo.com/coronavirus-in-oc. Individuals interested in receiving a COVID-19 vaccine can schedule an appointment by visiting https://www.othena.com or calling the OC COVID-19 Hotline at (714) 834-2000.

QSO Today Virtual Ham Expo: August 14-15

The next QSO Today Virtual Ham Expo is scheduled live from August 14-15, 2021, and then on-demand for 30 days. With over 90 speakers, networking, and exhibitors, you'll learn about new ideas, equipment, and practical techniques. Topics include (sample list): Emergency Services; Antennas; HF Operation; Contesting; DXpeditions; Ham Radio on a Budget; Satellite Communication; VHF and Above; Digital Modes; QRP; Homebrewing; Field, Mobile; Software Defined Radio; Test Equipment and Repair; and more. See a complete speaker list at https://www.qsotodayhamexpo.com/spkrlist.html.

Watch as many presentations as you want. Return anytime within 30 days to listen to any live speakers you missed, as well as explore exhibitor offerings. At the last Expo, 7,500 attendees downloaded 100,000 presentations. You can download speaker times directly to your Google or Outlook calendar. You can participate in live video lounges to interact with exhibitors and fellow hams.

Early Bird Tickets are $10.00, $12.50 at the "door." Tickets include entry for the live two-day period and the 30-day on-demand period. Access to only the exhibitor area is free. For more information, go to https://www.qsotodayhamexpo.com.

Next OCRACES Teams Meeting: August 2nd

Our next OCRACES meeting will be on Monday, August 2, 2021, at 7:30 PM. Joe Selikov, KB6EID, will host the online meeting on Microsoft Teams. You can download Teams here for your desktop and for your mobile. A meeting link will be emailed to the ocsd-races Groups.io list and to OCRACES applicants. Members of city, county, and state RACES units are invited to attend this meeting and discuss your latest homebrew projects. We will also solicit ideas during the meeting to incorporate into our next City/County RACES & EmComm ACS Exercise on Saturday, October 2, 2021.

With OCRACES administration transitioning to the Reserve Bureau and coordination to the Emergency Management Division, RACES PSRs and sworn Reserves will eventually meet in person at Sheriff's facilities. Some future meetings with expected large attendance, including non-OCRACES members, might continue to be held on Teams.

Hams Respond to Western Europe Flooding

International Amateur Radio Union (IARU) Region 1 Emergency Communications Coordinator Greg Mossop, GØDUB, reported that amateur radio volunteers have responded in the wake of widespread and catastrophic flooding in Germany, Belgium, and the Netherlands. The flooding, resulting from unprecedented heavy rainfall, has claimed more than 120 lives. Hundreds more remain unaccounted for.

The Dutch Amateur Radio Emergency Service (DARES) was on standby since July 14th, as the first reports of flooding came in. An initial attempt to establish a point-to-point link from the provincial capital of Maastricht to the north of Limburg province was halted due to heavy traffic, as residents evacuated low-lying areas. DARES volunteers were in contact with members of the Belgian Emergency Amateur Radio Service (B-EARS) to coordinate their efforts.

The European Civil Protection Mechanism was activated, and emergency groups across the region reported their governments were sending extra assistance and supplies to the areas where damage was worst. The flood water surge continued to make its way north, leading to further evacuations, and amateur radio emergency groups focused on requests for assistance. B-EARS asked to provide a backup VHF link between the emergency call center in Brussels and the province of Hainaut through Friday, while DARES had four stations active in the Limburg area ready to respond if needed.

The greatest loss of life and damage has occurred in Germany, where more than 1,000 residents remain unaccounted for. The loss of mobile telecommunication networks has slowed the effort to locate people, while many others are without power or homes. The emergency communications unit of the Deutscher Amateur Radio Club (DARC) has been handling inquiries for amateur radio support in the worst-hit areas, but members in the area have been flood victims as well, losing equipment or their homes.

"Amateur radio clubs have been in contact with relevant authorities, but there is currently no need for operational support from radio amateurs," the DARC reported. A mutual-aid arrangement exists among amateur radio organizations in Germany, Belgium, and the Netherlands. Mossop said emergency communications groups in the affected and surrounding regions are ready to respond to requests and have been coordinating their efforts as needed.

"This emergency will last for some time as infrastructure is repaired and the threat from damaged dams and more rainfall is reduced," Mossop said.

Thanks to IARU and DARC, as published on the ARRL website.

Check These Wildfire Websites

Cal OES has pointed out a couple of wildfire websites that might be of interest to RACES members:

National Interagency Fire Center (NIFC)

The NIFC FTP Server at https://ftp.wildfire.gov/ is an official site for interagency wildland fire incident data and documents. This ftp service is intended for short-term interagency sharing, not as a file archive or records repository.

Wildfire Intel Community Forum

Wildfireintel (https://forums.wildfireintel.org/) is a free and open forum for discussing everything wildfire. It covers health and safety to active incidents.

Countywide RACES/EmComm News

**"RACES/
EmComm
News" provides
an opportunity
to share
information
from all City &
County
RACES/ACS
units and
EmComm
organizations
and supportive
amateur radio
clubs in Orange
County, as well
as from Cal
OES and
federal
agencies.**

**Please send
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Huntington Beach RACES

Assistant Chief Radio Officer Greg Turlis, K6GAT, reported that Huntington Beach RACES had its first in-person meeting Monday night, July 12, 2021, since the COVID-19 pandemic started. They discussed their Field Day that took place at the beach, where they operated two stations out of their trailer. They did not make many contacts; it was more of a social event. They also discussed the upcoming Air Show on October 1 -3, 2021, and the Surf City marathon that was moved from February to September 11th. HBRACES is in the planning stage for both events. Greg predicts a busy fall for HBRACES.

Orange County Fire Watch

On July 1, 2021, Orange County Fire Watch Manager Tony Pointer issued a deployment plan for July 3rd and 4th. Every year during the 4th of July celebration, illegal fireworks are the leading cause for wildfires in County Parks and open-space preserves. OC Parks and Orange County Fire Authority (OCFA) asked Fire Watch to assist in their fire-prevention efforts by providing an additional presence in parks and open spaces over the peak holiday weekend. Locations were selected due to their high attendance, and potential fire activity due to illegal fireworks or historical fire activity. Shifts at these locations reflected peak attendance hours for these parks. Fire Watch volunteers were positioned at multiple locations in Orange County. On July 3rd, they were at Irvine Regional Park from 1000 to 1800 hours and at Virtual Fire Tower (on alertwildfire.org and Display.alertwildfire.org) from 1000 to 1800 hours. On July 4th, they were at Irvine Regional Park from 1000 to 1800 hours, at Laguna Coast Wilderness Park from 1000 to 2200 hours, at Laguna Niguel Regional Park/Aliso and Wood Canyons Wilderness Park from 1200 to 2000 hours, at Irvine Ranch Open Space (Black Star Canyon Gate) from 1200 to 1700 hours, at Carbon Canyon Regional Park from 1200 to 2200 hours, and at Virtual Fire Tower (on alertwildfire.org and Display.alertwildfire.org) from 1000 to 1800 hours.

California Governor's Office of Emergency Services (Cal OES)

Jim Price, Communications Center Operations, Communications Reserve Unit (CRU), Cal OES, says JS8Call is amazing how it can connect with weak signals. He also likes that, when sending out a "heartbeat," you can see which stations can hear you. "It isn't fast, but is good for short messages and to find which stations are on the air." The 40-meter frequency is 7078 kHz. Although Jim has used JS8Call, he has not yet determined how best to use it for Cal OES purposes. Marin County has been running a weekly JS8Call NVIS net.

Jim commented that the new ION2G ALE software opens up new opportunities for HF communication. Automatic Link Establishment allows HF radios to communicate with each other, in order to establish the best path. Radios send out a signal that allows other radios to build up a Link Quality Analysis (LQA) table. When a call is made, the radio uses this table to determine the best frequency to use. In the past, this capability was built into expensive radios like the Micom, Harris, Barrett, Codan, and Icom IC-8100. There is PCALE and MARSALE software that can be used with amateur radios, but is difficult to set up and use. Just released is ION2G software that runs on Windows and the Raspberry Pi. ION2G controls many amateur radios and gives them ALE capability. These radios may be "opened up" and legally used on the SHARES ALE frequencies.

Jim said that Cal OES is in the beginning stages of setting up a SHARES California Emergency Services ALE net. So far they have a station in the SOCC at Mather and one in the Southern Region in Los Alamitos. They hope to add a station for MAR-III in Redding soon. Lee Rominger, W6LFR, and Jim also have stations that they are using for testing. Los Angeles County Sheriff and the California Independent System Operator are also on their net. Jim said that Cal OES would like to add California Counties and Agencies, which are most likely eligible for a SHARES callsign, which will allow them to use the less crowded SHARES frequencies, as well as providing other benefits not restricted by FCC Part 97.

August 2021

Sun	Mon	Tue	Wed	Thu	Fri	Sat
1	2 Weekly 2 m ACS Net & OCRACES Teams Mtg	3	4	5	6	7 Weekly 60 m ACS Net
8	9 Weekly 2 m ACS Net	10	11	12	13	14 Weekly 60 m ACS Net
15	16 Weekly 2 m ACS Net	17	18	19	20 Orange County Amateur Radio Club Meeting	21 Weekly 60 m ACS Net
22	23 ACS Net on 4 Bands	24	25	26	27	28 Weekly 60 m ACS Net
29	30 Weekly 2 m ACS Net	31				

Upcoming Events:

- **August 2:** OCRACES Meeting on Microsoft Teams, 1930 hours
- **August 20:** Orange County Amateur Radio Club Meeting on Zoom, 1900 hours
- **October 2:** City/County RACES & EmComm ACS Exercise
- **October 14:** Orientation for PSRs, Sheriff's Academy, 1830 hours
- **October 23:** Prescreen for PSRs, Sheriff's Academy, 0900 hours

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
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 @!

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"W6ACS ...
Serving
Orange County"

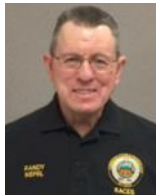# Meet Your County of Orange RACES Members!

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