March 2020

Newsletter of the County of Orange Radio Amateur Civil Emergency Service

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Next OCRACES Meeting:

Monday, March 2, 2020, at 1930 Hours

840 N. Eckhoff Street, Suite 104, Orange

John Pilger, K6PIO: Maricopa County Sheriff's Communications Posse

Orange County Sheriff's Department
Communications & Technology Division

Captain's Corner

by RACES Captain Ken Bourne, W6HK, Chief Radio Officer

Comparing NXDN, DMR, P25

We are looking forward to a presentation by Steve Clark, KC6FEW, at an upcoming OCRACES meeting on the ZUMspot digital hotspot, which, like other hotspots, is essentially a personal digital voice repeater and gateway. The ZUMspot RPi Nextion 2.4 Kit sold by Ham Radio Outlet supports DMR, P25, D-STAR, System Fusion, NXDN, and POCSAG. Some of you might not be familiar with all of these digital modes. In this article I will focus on NXDN, plus some comments about DMR and P25.

NXDN

NXDN stands for "Next Generation Digital Narrowband." It is a digital narrowband trunked radio protocol developed jointly by Kenwood and Icom. It is used in commercial, business and industry, transportation, and public-safety professional radio systems, but rarely by radio amateurs.

NXDN uses Frequency Division Multiple Access (FDMA), employing a 4-level FSK modulation scheme similar to Yaesu's System Fusion, but the two modes are not compatible. Kenwood calls theirs "NEXEDGE" and the Icom brand is "IDAS" (Icom Digital Advanced System).

An NXDN channel is either 12.5 kHz or 6.25 kHz wide. A 6.25-kHz dual-channel system can be configured to fit within a 12.5 kHz channel, effectively doubling the spectrum efficiency compared to an analog FM system occupying a 12.5 kHz channel. Two NXDN channels within a 12.5 kHz channel can be allocated as voice/voice, voice/data, or data/data.

There are two main modes, NXDN48 and NXDN96. NXDN48 bandwidth is 6.25 kHz, symbol rate is 2400 baud, data rate is 4800 bps, with two FDMA channels per 12.5-kHz channel, speech code rate is 3600 bps, and C4FM frequency deviation is ±1050 Hz, ±350 Hz. NXDN96 bandwidth is 12.5 kHz, symbol rate is 4800 baud, data rate is 9600 bps, with one FDMA channel per 12-kHz channel, speech code rate is 3600 bps (7200 bps option), and C4FM frequency deviation is ±2400 Hz, ±800 Hz.

Kenwood's NXDN radios are an ITU-R accepted Common Air Interface (CAI) NEXEDGE digital two-way radio system. Enhanced Mixed Zone allows any digital CAI and/or FM analog to reside in the same zone. Zone scan automatically sets all users in the same zone in the same RX/TX mode. The NX-5000 and NX-3000 Series radios are able to communicate in analog, NXDN, DMR, and P25 formats.

A few years ago, the FCC forced existing commercial users to "narrowband," transitioning from 25 kHz bandwidth to 12.5 kHz. But that was just a stepping stone to 6.25 kHz, which is incompatible with analog voice. Two technologies evolved from this—one based on TDMA (Time Division Multiple Access) and the other on FDMA (Frequency Division Multiple Access). Those two technologies are not compatible with each other.

Captain's Corner Continued from page 1

TDMA transmissions (such as DMR) have 12.5 kHz bandwidth, but two groups can transmit at the same time, effectively creating two equivalent 6.25 kHz channels. FDMA transmission bandwidth is 6.25 kHz. Multiple transmissions are divided by being on different frequencies.

NXDN supports the European dPMR (Digital Private Mobile Radio) standard but does not comply with all aspects of it.

NXDN complies with FCC requirements for 6.25 kHz channel equivalence. In the commercial market, cost is relatively low compared with other digital modes. It is backwards compatible with analog and with LTR (Logic Trunked Radio) networks. NXDN is commonly thought to sound better than DMR. Trunked NXDN products from different manufacturers (such as Kenwood and Icom) are not compatible with each other, but trunking is not an issue in amateur radio. Portable battery shift life is shorter than with DMR radios, due to the FDMA transmission format compared with DMR's TDMA transmissions that 27.5 ms long every 60 ms. NXDN FDMA technology is also outdated and proprietary.

Amateur repeaters using NXDN are rare. The only one I see listed in California on *RepeaterBook* is WA6YLB on 443.500 MHz (+) in Visalia.

DMR

DMR operates in 12.5 kHz channels and uses 2 slot TDMA to achieve 6.25 kHz equivalence. Tier II is conventional (as used by radio amateurs) and Tier III is trunked. Data throughput is similar to P25 Phase 2, at 9600 bps (symbol rate of 4800 symbols per second). With 4FSK modulation, there is no need for linear transmitters and cost is about the same as analog FM transmitters. Coverage is about the same as analog FM.

DMR is a non-proprietary open standard. TDMA extends radio battery life when compared with 12.5 kHz analog FM radios or P25 Phase 1 radios. However, it does not provide full-duplex operation.

Both DMR and dPMR/NXDN/NEXEDGE/IDAS appear to achieve one communications path per 6.25 kHz of spectrum. However, Tait Communications points out that, in the case of an emergency, when you need the radio system the most, dPMR/NXDN/NexEdge will suffer increased interference, which means a user can only reliably use every other 6.25 kHz channel. Tait says DMR will achieve one communications path per 6.25 kHz of spectrum, irrespective of loading, twice the capacity of analog narrowband FM. Despite Tait's touting of DMR over NXDN, it has an impractical aspect for amateur use. In a typical DMR repeater system, several talkgroups exist on each time slot. A typically long ham conversation (compared to shorter communications on commercial channels) will tie up one DMR time slot so that other talkgroups on that time slot are unusable at the time. If there is a pause in the conversation, someone on another talkgroup might "hi-jack" the time slot and the original conversation will be disrupted or lost. That problem can be overcome through the use of a hotspot, such as the ZUMspot that Steve Clark, KC6FEW, will talk about at an upcoming OCRACES meeting.

P25

P25 is a common format in commercial and public-safety radio systems, but there are very few P25 amateur radio repeaters. The original P25 Phase 1 uses a C4FM modulation scheme (similar to Yaesu's System Fusion, but not compatible). Data throughput is similar to DMR. There is no need for linear transmitters; thus, cost and size are about the same as an analog transmitter. Transmitter output spectrum fits into existing 12.5 kHz narrowband FM analog channels.

P25 Phase 2 is a 2-slot TDMA system. It has a lower data throughput than TETRA (a European standard for a digital trunked radio system) at 12,000 bps (symbol rate of 4800 symbols per second). Modulation schemes are intended to optimize performance and simplify terminal design. It uses HDQPSK modulation in the downlink (base station to terminals), requiring a more expensive and larger linear base-station transmitter. Transmitter output spectrum fits into existing 12.5 kHz narrowband FM analog channels.

P25 is a non-proprietary open standard, designed particularly for public safety. It provides conventional, trunked, and simulcast options, including combinations of these options. Equipment can operate in analog FM mode, in digital P25 mode, or in dual mode. It supports simplex mode (repeater talkaround) for direct communications outside network coverage. It also allows secure end-to-end encryption (not legal for amateur radio communications). Phase 1 provides only 12.5 kHz channel efficiency (FDMA). Phase 2 provides 6.25 kHz channel equivalence (TDMA), but only for voice. While P25 radios can be dual-mode (analog FM or digital P25), trunked P25 networks cannot provide analog FM. In general, P25 systems are relatively expensive.

March 2nd OCRACES Meeting: Arizona Posse!

John Pilger, K6PIO, will give an exciting presentation on his experiences with the Maricopa County Sheriff's Communications Posse at the next OCRACES meeting. Also at this meeting will be an MOU signing ceremony between OCRACES and the Orange County Hospital Emergency Amateur Radio Team (OCHEART). This meeting will be on Monday, March 2, 2020, at 7:30 PM, at OCSD Communications & Technology Division, 840 N. Eckhoff Street, Suite 104, in Orange.

Preparing for the Coronavirus

A coronavirus case occurring in Orange County was covered in February 2020 *NetControl*. In case the deadly new COVID-19 coronavirus is declared a pandemic, it would be advisable to have already collected a list of items suggested by virologist Ian Mackay, adjunct Associate Professor at the University of Queensland, Australia, as reported by *Newsweek*. He said we can reduce our risk of being infected and cut the chance of running out of essential foods and goods. RACES members are advised to check this list, to protect our families and to maintain our health in case we need to respond during a pandemic to assist with communications between the Orange County Health Care Agency's and OCSD's EOCs.

Mackay's list includes extra prescription medications, asthma relief inhalers, and over-the-counter anti-fever and pain medicines (such as paracetamol and ibuprofen); feminine hygiene products; toilet paper, tissues, and paper towels; and vitamins "in case food shortages limit the variety in your diet." He also advised buying items including soap, alcohol hand rub, and household cleaning products (such as bleach, floor cleaner, toilet cleaner, surface-cleaning spray, and laundry detergent). His list also included "batteries for anything that needs batteries."

In terms of food, Mackay suggested purchasing cereals, grains, beans, lentils, and pasta; tinned food such as fish, vegetables, and fruit; oil, spices, and other flavorings; dried fruit and nuts; powdered milk; items for pets; as well as soft drinks, candy, and chocolate for treats. He also urged people to consider the needs of elderly relatives.

Mackay also provided a list to be used in the event that a "severe" pandemic cuts access to fresh foods. The products "should be the last things to buy if you have a hint of when supplies might slow or stop for a (hopefully) short time." Those include bread and wraps, meat for freezing, milk, eggs, yogurt, and fruit and vegetables. Car fuel should also be bought at this time, he said.

OCRACES Repeater Operations

Several years ago, The Orange Radio Amateur Club was given permission to conduct a brief net on the OCRACES 146.895 MHz open repeater. Their net is every Wednesday morning at 0900 hours and typically lasts less than 10 minutes. Later that morning, their members meet at the Orange Senior Center, 170 S. Olive Street, in Orange.

The Orange County Hospital Emergency Amateur Radio Team (OCHEART), which is participating in an MOU signing ceremony at the March 2nd OCRACES meeting, plans to conduct a brief net every Wednesday evening at 1900 hours on the OCRACES 146.895 MHz open repeater.

Because the OCRACES 2-meter, 6-meter, and 1.2-GHz repeaters are open, brief nets (preferably less than 15 minutes, with permission from the OCSD Emergency Communications Coordinator or the OCRACES Chief Radio Officer) and normal amateur radio communications may occur whenever OCRACES is not using the repeater for activations, drills, or events. Non-RACES radio amateurs using the OCRACES open repeaters are asked to keep their conversations to less than 15 minutes, to allow others to use the repeaters and to encourage non-distracted monitoring by OCRACES members. The OCRACES 10-meter and 1¼-meter repeaters are also open, but are currently down for maintenance.

The four OCRACES private 70-centimeter repeaters may only be used by OCRACES members and OCSD staff for normal amateur radio communications. City RACES and MOU units may check into OCRACES nets and drills on those repeaters, and may use those repeaters for emergency communications, tests, brief nets (with permission), and prior-approved events, but not for normal amateur radio communications.

Every Monday at 1900 hours, OCRACES conducts a City/MOU/County ACS net on the 2-meter repeater. Every fourth Monday, the 2-meter net is followed by roll calls on one of the four OCRACES private 70-centimeter repeaters (rotating between each of those repeaters each month), and then on the 52.62 MHz repeater. CTCSS subaudible tones ("PLs") are listed on page 7 of this newsletter.

ACS Radio Rodeo: Saturday, May 2nd

County and City RACES and MOU Units will participate in the annual ACS Radio Rodeo on Saturday, May 2, 2020. Set-up will begin at 0800 hours. A mandatory briefing will be at 0830 hours. Operations will be from 0900 to 1100 hours. This exercise will be conducted locally by OCRACES in the rear parking lot of OCSD Communications & Technology Division, 840 N. Eckhoff Street, in Orange.

Although it began as a City/County RACES & MOU exercise in Orange County, ACS Radio Rodeo is now hosted by the California Governor's Office of Emergency Services (Cal OES), and covers the 11 counties of the Southern Region. The primary purpose of the event is to conduct radio tests among RACES/ACS mobile communications vehicles and portable stations within an Operational Area and with the Cal OES Regional EOC in Los Alamitos, which then tests communications with a station in each Operational Area central location. Each participating county in the exercise will have at least one central location where emergency communications vehicles will be gathered.

The exercise will follow standard ICS procedures. Everyone must sign the ICS 211 A Incident Personnel Check-in List when they arrive at the central location. An exercise plan (Incident Action Plan) will be e-mailed to all agencies. An ICS 205 Incident Radio Communications Plan will list the roll-call frequencies.

The first operational hour (0900-1000) will consist of local roll calls of vehicles and portable stations at Eckhoff. Our HF operation will be on 60 meters Channel 4 (5371.5 kHz upper-sideband dial frequency), and stations in other Operational Areas may also check in with us on that band. We will also have a full roll call on the 146.895 MHz repeater, followed by abbreviated roll calls on the 448.320 MHz and 52.62 MHz repeaters. Scheduling and coordination will be conducted on 146.595 MHz simplex.

During the second operational hour (1000-1100), Cal OES Southern Region will conduct roll calls from their Regional EOC in Los Alamitos. These roll calls will be on 60 meters Channel 4, Cactus 70-cm linked system, SCRN 70-cm linked system, EARN 1¼-m linked system, OCRACES 448.320 MHz repeater, LACDCS repeaters, and possibly on a Riverside County 1¼-m RACES repeater. Only one or two stations at Eckhoff will participate in the Cal OES Southern Region roll calls. During that second operational hour, local participants will communicate with each other and with their EOCs or other non-centralized stations on their agencies' RACES/ACS frequencies, and will inspect each other's mobile communications vehicles and portable stations.

Debriefing will be at 1100 to 1115 hours, followed by demobilization.

OCSD/EMD Offers Training Classes at EOC

OCSD Emergency Management Division (EMD) says as Disaster Service Workers we may be called upon to participate in exercises for preparedness or activation by the County Emergency Operations Center (EOC) in the event of a disaster. Training opportunities are available to acquaint you with the EOC, the California State mandated Standardized Emergency Management System (SEMS), as well as your role during emergencies and exercises.

EMD has released a training schedule of offered courses through June 2020. Courses for February and March are listed below. Download course descriptions and registration form from https://ocraces.org/forms.html. E-mail the registration form to Michelle Baldwin at mbaldwin@ocsd.org. Confirmation for training and a map to the EOC will be sent to you by e-mail upon receipt of your approved registration. If you have not received confirmation within one week of the training date, please e-mail Michelle.

The courses offered for March 2020 at the Orange County EOC include:

- **AlertOC Training**—Support Center; Tuesday, March 10, 1:30 PM to 3:30 PM
- **WebEOC 8.0/JIMS 8.0**—Support Center; Wednesday, March 11, 1:30 PM to 3:30 PM
- **San Onofre Nuclear Generating Station Emergency Planning Overview**—Support Center; Thursday, March 19, 1:30 PM to 3:30 PM
- **EOC Response: Action Planning, Information Analysis, Situation Awareness**—Operations Center; Tuesday, March 24, 9:00 AM to 12:00 PM

The courses offered for April 2020 at the Orange County EOC include:

- **EOC Support Pool Training**—Support Center; Wednesday, April 8, 9:00 AM to 11 AM
- **AlertOC Training**—Support Center; Thursday, April 16, 9:00 AM to 11 AM
- **WebEOC 8.0/JIMS 8.0**—Support Center; Tuesday, April 21, 10:00 AM to 12:00 PM
- **EOC Management Training**—Command Center; Wednesday, April 22, 9:00 AM to 11 AM
- **Public Information Officer & PIO Support Staff**—Support Center; Thursday, April 30, 1:30 PM to 3:30 PM

KØVNJ and KK6YUP Hide in Orange

At the fox's den are (left to right) Skip Skipper, KC6WJJ, Ron Allerdice, WA6CYY, Don Poysa, KØVNJ, Jeff Mikoleit, KK6YUP, Julie Warrick, KN6AOC, and Mark Warrick, KM6ZPO.

Don Poysa, KØVNJ, and Jeff Mikoleit, KK6YUP, from City of Orange RACES (COAR), were the fox on the monthly cooperative T-hunt on Monday, February 17, 2020. They began transmitting on the input of the 146.895 MHz repeater immediately following the 7:00 PM OCRACES net. They hid at Serrano Park in the hills of Orange. All three hunting teams compared bearings on the 448.320 MHz repeater and beaconed via APRS while hunting. The first team to find the fox consisted of Ken Bourne, W6HK, and Skip Skipper, KC6WJJ. They started at the Orange County Mining Company at Chapman Avenue and Cannon Street. They got a good north-northeast bearing and headed up Cannon Avenue to Serrano Avenue, to Serrano Park. Meanwhile, Ron Allerdice, WA6CYY, was heading east from the 55 Freeway on Katella Avenue/Villa Park Road to Cannon Street to Serrano Avenue. As he stopped for a bearing on Serrano Avenue, Ken and Skipper passed him and arrived at the park a couple of minutes before Ron arrived. The third team to arrive consisted of Mark and Julie Warrick, KM6ZPO and KN6AOC, who "enjoyed" the signal reflections in the hills of Anaheim and Orange.

The next hunt will be on Monday, March 16, 2020, immediately following the OCRACES 2-meter net (approximately 7:20 PM). The fox will hide on paved, publicly accessible property in a city or sector of Orange County to be announced a few days before the hunt. He will transmit tones on the input (146.295 MHz) of the 146.895 MHz repeater. Hunters will compare bearings via the 448.320 MHz repeater and are encouraged to beacon their positions via APRS while hunting. We are looking for a volunteer to be the fox.

The cooperative T-hunts are usually held on the third Monday of each month (except in October). The hunts are not official RACES events, so DSW (Disaster Service Worker) coverage does not apply. Please drive carefully!

To keep our cooperative T-hunts active, we need to have more participants. RACES members are urged to equip themselves with direction-finding equipment and be ready to find sources of interference to RACES repeaters and to VHF public-safety communications. These hunts provide excellent practice in working together to find such interference—plus they are great fun!

An easy-to-build tape-measure yagi for T-hunting is described at http://theleggios.net/wb2hol/projects/rdf/tape_bm.htm. Several of these were built at the August 16, 2019, meeting of the Orange County Amateur Radio Club. Fox-hunt loops and beams are available from Arrow Antenna and HRO, including the Arrow Model FHL-VHF fox-hunt loop (covers 1 MHz to 600 MHz) and the Arrow Model 146-3 three-element portable hand-held yagi. The Arrow OFHA 4-MHz offset attenuator can be useful when close to the fox, to prevent receiver overload. For on-foot hunting, the BC-146.565 three-element, hand-held, foldup, yagi antenna is available from Bob Miller Enterprises (http://www.rdfantennas.com), along with the VK3YNG MK4 sniffer. An all-mode transceiver is quite useful, allowing hunters to switch to the SSB or CW mode for detecting extremely weak signals, or to switch in a built-in attenuator, reduce RF gain, or tune slightly off frequency when dealing with extremely strong signals. Some hunters use the DF2020T radio direction finder kit, which is a Doppler system available from Global TSCM Group, Inc. (http://www.kn2c.us). A very similar system is the MFJ-5005 Doppler direction finder. Useful apps are available for iPhones and Android phones. One such app is FoxHunt Pro, available for $1.99 for iPhones.

PSR Applicant Orientation: March 7th

There is a growing need for OCRACES members to be a part of the OCSD Reserve Team as OCSD Professional Services Responders (PSRs) or sworn Reserve Deputies. A member or applicant who is not already a PSR or sworn Reserve is urged to attend the next PSR Applicant Orientation on Saturday, March 7, 2020, at 0900 to 1100 hours, at the Sheriff's Regional Academy, 15991 Armstrong Avenue, in Tustin. See http://www.ocsd.org/divisions/fieldops/security/mutual/reserve/join for information on joining the Reserves, and http://www.ocsd.org/divisions/fieldops/security/mutual/reserve/psr for information on the PSR program.

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

Fountain Valley RACES

The next Fountain Valley RACES meeting is on Saturday, March 6, 2020, at 0800 hours.

Mission Viejo RACES

Mission Viejo RACES Chief Radio Officer Charley Speelman, WA6RUZ, submitted the following news:

"Mission Viejo RACES-ARES will again be providing communications for the 'Oso Fit Community Fair and 5K Fun Run' in Mission Viejo on February 29th (this is the 3rd annual event). Come join us for the OsoFit 5K on Saturday 2/29/20 for a morning of health, fitness, and fun! You can walk or run the 5K, and there will be a kids race (1/4 & 1/2 mile) as well! Our past bike recipients are invited to ride their bikes in the kids race. So please come and support our cause. 100% of the pre-registration fees goes to us and directly to assisting a child with special needs obtain an adaptive bike."

Irvine RACES (IDEC)

The next IDEC VikiBrek will be on Saturday, March 14, 2020, at 8:00 AM, at Knowlwood Restaurant, Sand Canyon Avenue and Burt Road. Visitors are welcome. The IDEC Spring Drill will be on Saturday, April 25, 2020.

ARRL Field Day

Several City RACES units in Orange County will participate in the ARRL's Field Day on the fourth full weekend in June (27th and 28th). Every June, more than 40,000 hams throughout North America set up temporary transmitting stations in public places to demonstrate ham radio's science, skill, and service to our communities and our nation. It combines public service, emergency preparedness, community outreach, and technical skills all in a single event. The objective is to contact as many stations as possible on the 160, 80, 40, 20, 15, and 10-meter HF bands, as well as all bands 50 MHz and above, and to learn to operate in abnormal situations in less than optimal conditions.

Orange County Amateur Radio Club (OCARC)

The next meeting of the Orange County Amateur Radio Club (OCARC) is on Friday, March 20, 2020, at 1900 hours, at American Red Cross (George M. Chitty Building), 600 Parkcenter Drive, in Santa Ana.

OCARC will once again participate in ARRL Field Day on the weekend of June 27 -28, 2020. OCRACES members are urged to participate with OCARC in this event.

OCARC's annual club auction will be on Friday, October 16, 2020.

Amateur Radio License Exams

March 14, 2020; 9:00 AM (walk-ins allowed)
Sponsor and Contact: Harrison Spain, AC6TI
714-886-8039; hmspain@gmail.com
VEC: ARRL/VEC
Siemens PLM Software, 10824 Hope St., Cypress

March 19, 2020; 5:30 PM (walk-ins allowed)
Sponsor: West Coast ARC
Contact: Ken Simpson, W6KOS
714-651-6535; w6kos@arrl.net
VEC: ARRL/VEC
Community United Methodist Church, 6652 Heil Ave., Huntington Beach

March 19, 2020; 6:00 PM (walk-ins allowed, pre-registration preferred)
Sponsor: Western ARA
Contact: George Jacob, N6VNI
562-544-7373; jac2247@gmail.com
VEC: ARRL/VEC
La Habra Community Center, 101 W. La Habra Blvd., La Habra

March 28, 2020; 9:30 AM (no walk-ins, call ahead)
Sponsor: PAPA System Repeater Group
Contact: Jack Suchocki, W6VFR
954-816-8721; jack@w6vfr.com
VEC: Greater LA VEC
Marie Callender's Restaurant & Bakery, 540 N. Euclid St., Anaheim

March 2020

Sun	Mon	Tue	Wed	Thu	Fri	Sat
1	2 Weekly 2 m ACS Net & OCRACES Meeting	3	4	5	6	7 Weekly 60 m ACS Net
8	9 Weekly 2 m ACS Net	10	11	12	13	14 PSR Meeting (no net)
15	16 Weekly 2 ACS Net & Cooperative T-Hunt	17	18	19	20 Orange County Amateur Radio Club Meeting	21 Weekly 60 m ACS Net
22	23 ACS Net on Three Bands & Cal OES Nets	24	25	26	27	28 Weekly 60 m ACS Net
29	30 Weekly 2 m ACS Net	31				

Upcoming Events:

- **March 2:** OCRACES Meeting, 1930 hours, 840 N. Eckhoff Street, Suite 104, Orange
- **March 14:** Sworn Reserve Meeting, 0800-1200 hours, and PSR General Membership Meeting, 1000-1430 hours, Sheriff's Regional Training Academy, Tustin
- **March 16:** Cooperative T-hunt, 1920 hours
- **March 20:** Orange County Amateur Radio Club (OCARC) Meeting, 1900 hours, American Red Cross (George M. Chitty Building), 600 Parkcenter Drive, Santa Ana
- **April 4-5:** Baker to Las Vegas Challenge Cup Relay
- **May 2:** ACS Radio Rodeo, 0830-1100 hours, 840 N. Eckhoff Street (rear parking lot), Orange
- **June 8:** City/County RACES & MOU Meeting, 1930 hours, 840 N. Eckhoff Street, Suite 104, Orange
- **June 27-28:** ARRL Field Day
- **July 11:** HRO Ham Jam

www.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

OCSD Emerg. Comm's Coordinator
Pete Jimenez, KI6UTE, 714-704-8080

OCSD Sr. Telecommunications Engr.
Erik Schull, KE6BVI, 714-704-7937

Chief Radio Officer (Captain)
Ken Bourne, W6HK, 714-997-0073

Radio Officer (Lieutenant)
Scott Byington, KC6MMF

Assistant Radio Officers (Sergeants)
Jack Barth, AB6VC
Ernest Fierheller, KG6LXT
Bob McFadden, KK6CUS
Tom Tracey, KC6FIC

County of Orange RACES

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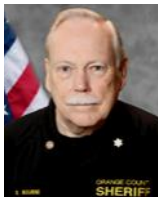
It's Where It's @!

Questions or Comments?
Contact *NetControl* Editor Ken Bourne, W6HK
kbourne.ocsd@earthlink.net

"W6ACS ... Serving Orange County"

Meet Your County of Orange RACES Members!

Officers

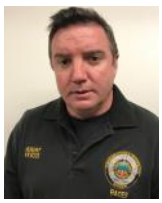


Ken Bourne
W6HK

Scott Byington
KC6MMF

Jack Barth
AB6VC

Ernest Fierheller
KG6LXT



Bob McFadden
KK6CUS

Tom Tracey
KC6FIC

Randy Benicky
N6PRL

Ray Grimes
N8RG

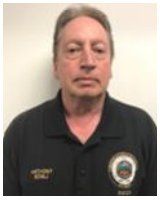
Lee Kaser
KK6VIV

Walter Kroy
KC6HAM

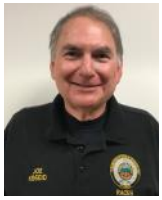
Martin La Rocque
N6NTH

Don Mikami
N6ELD

Harvey Packard
KM6BV



Tony Scalpi
N2VAJ



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