



Newsletter of the County of Orange Radio Amateur Civil Emergency Service

CRO's Nest

by Ken Bourne, W6HK, OCRACES Chief Radio Officer

Transmit Audio Equalizers

As RACES members, we need to strive for high understandability in our transmissions, especially under noisy conditions, rather than for professional broadcast audio with lots of “lows.”

Some hams spend a fortune on microphones that are used in the entertainment industry, thinking that they will sound as good as a professional entertainer or broadcast announcer on the air. That’s not what we need to strive for! Our objective is clarity of communications under noisy conditions.

Most modern HF transceivers have a menu setting for transmit audio, with a monitor function. Some transceivers allow you to adjust only bass levels and treble levels, but even such basic adjustments can be quite effective. More advanced transceivers provide transmit audio equalization. For example, the Elecraft K3 transceiver that we have in the Orange County EOC RACES Room provides eight bands of transmit (and receive) audio equalization. (So do other transceivers, such as the FLEX-6000 Series.) This feature can be used to compensate for variations in microphones and your voice.

Outboard equalizers, such as from W2IHY Technologies, are available for older transceivers. Radio amateurs who strive for professional-quality transmit audio, such as on ESSB (extended single-sideband) transmissions, or who use vintage AM transmitters on 75 meters and seek to sound like AM broadcast stations, will use equalizers such as the Behringer



W2IHY Technologies 8-band audio equalizer and noise gate (\$300) controls tonal qualities of your microphone and eliminates or reduces background noises. It matches practically any microphone of any impedance to practically any radio’s microphone input.



W2IHY Technologies offers the EQplus (\$390) as a stand-alone unit or to expand their 8-band audio equalizer/noise gate. It provides an adjustable compressor (to increase power), adjustable downward expander (for background noise reduction), and a limiter to manage onboard levels.

DEQ2496 Ultra-Curve Pro Mastering Processor (\$329 at Guitar Center), or will even spend several thousand dollars for high-end equalizers/processors. Behringer offers the FBQ800 ultra-compact 9-band graphic equalizer, with feedback elimination (\$59 at Guitar Center). However, whether you purchase an equalizer for \$59, \$329, or

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OCRACES
Online Meeting
on Microsoft
Teams:

Monday,
October 4, 2021
at 7:30 PM

CRO's Nest *Continued from page 1*



Behringer ULTRA-CURVE PRO DEQ2496 high-precision digital 24-bit/96-kHz equalizer, analyzer, feedback destroyer, and mastering processor. It provides dual 31-band graphic equalizers, 31-band virtual para-graphic equalizers, and 10-band parametric equalizers.

more than \$4,000, if it's not designed for amateur radio operation, it will possibly be susceptible to radio-frequency interference (RFI), which could be a challenge to eliminate by the use of RF chokes on all leads going into and out of the equalizer. Equalizers from amateur radio equipment manufacturers, such as W2IHY Technologies, are supposedly well shielded against RFI.

Under most circumstances, equalizers should be used with minimal adjustments for improved transmit audio performance. Excessive equalization should be avoided. Focus first on establishing good audio conditions, including choosing a high-quality microphone, minimizing local noise (such as fans), and employ proper techniques in using your microphone.

Experiment with microphone placement. Some voice characteristics require speaking directly into your microphone, whereas other characteristics speaking to the side. Either way, avoid picking sounds of your breathing. Perhaps holding your microphone 3 to 5 inches from your mouth would be ideal. Remain at a constant distance from your microphone, to assure consistent volume.

Do not "crowd" your microphone. Base-sounding tones are enhanced by "close talking" a directional microphone, thus decreasing the crispness that you want and making you more prone to "popping your Ps" when a burst of air from your mouth overloads and distorts the microphone. Pop filters, while effective for stopping "B" and "P" sounds, don't typically help with *sibilance*, which is the overproduction of the high-frequency hiss at the beginning of an "S" sound. A de-esser is an audio processor developed purely to eliminate sibilance. Careful use of your microphone will reduce the need for filters and de-essers, but high quality equalizers with processors, such as the Behringer DEQ2496, can help.

An equalizer (EQ) is a filter that allows you to adjust the level of a frequency or frequency range of your voice audio. In its simplest form, an EQ allows you to turn the treble and bass up or down. A graphic EQ controls gain of a set of fixed center frequencies, such as the 8 bands in the W2IHY Technologies EQ and in the Elecraft K3 and K4 and FLEX-6000 Series transceivers. The Kenwood TS-990S has an 18-band transmit DSP EQ, enabling notches to be inserted to a specific frequency. The Yaesu FTDX101 has a 3-band microphone parametric EQ. A

parametric EQ continuously controls the audio signal's frequency content, which is divided into several bands of frequencies. A fully parametric EQ controls the bandwidth (range of frequencies affected), the center frequency of each band, and the level (boost/cut) of each band. It also separately controls the Q , which is the ratio of the center frequency to the bandwidth (not adjustable with a semi-parametric EQ). If the center frequency is fixed, bandwidth is inversely proportional to Q , so if you increase Q , you narrow the bandwidth. Continuous bandwidth control and/or continuous Q control in a fully parametric EQ allows you to attenuate or boost a very narrow or wide range of frequencies. With a very narrow bandwidth (higher Q), you can isolate a particular frequency (such as your voice's nasal quality) and remove or reject it (notch it out). Likewise, a narrow bandwidth can boost pleasant tones as well. A broad bandwidth accentuates or attenuates a larger band of frequencies. The broad and narrow bandwidths (high and low Q) are usually used in conjunction with one another to achieve the desired effect.

A shelving EQ attenuates or boosts frequencies above or below a specified cutoff point. Low-pass shelving filters pass all frequencies below the specified cutoff frequency while attenuating all the frequencies above it. A high-pass filter passes all frequencies above the specified cut-off frequency while attenuating everything below. For effective, clean, and pleasant-sounding transmit audio, apply a high-pass (low-cut) filter, since extremely low voice frequencies simply waste transmit power.

Before boosting the desired frequencies, cut out the unwanted frequencies (such as in the low range or nasal range). After cutting undesired frequencies, you might discover that you don't need to boost the other frequencies. Frequency boosts are easier to hear than cuts, which might cause you to boost frequencies you might want to bring out, rather than cut problem frequencies. That's not good. If you boost at 3 kHz to achieve greater presence, your transmit audio might become harsh and cutting. Also, if you boost all of the frequencies (such as extreme lows, upper midrange, and high end) around an undesired frequency (such as lower-mid), rather than cutting the undesired frequency, you might overload the EQ gain stage and cause distortion.

UHF Channels in Orange County

by Robert Stoffel, KD6DAQ

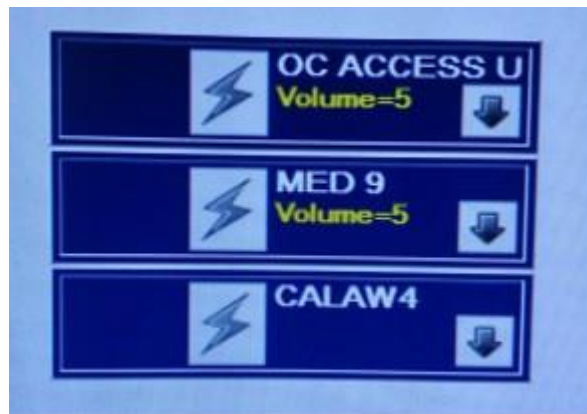
As RACES members, we are sometimes called upon to operate on public-safety radio channels, either from the Orange County Emergency Operations Center (EOC) on Loma Ridge, or in the field with the Control 7 communications response vehicle. In this continuing series, I am sharing information about these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

This month, we take a look at the UHF Band, and the channels that RACES members may be asked to monitor or transmit on. Orange County operates a number of UHF channels for interoperable communications with agencies in Southern California that use UHF as their primary radio system. In this band we have two types of channels, simplex and repeated. First, let's take a look at the repeated channels.

Orange County operates three simulcast and repeated UHF systems for interoperable communications. OC ACCESS U (pronounced "O-C-Access-You") is an Orange County channel available to any discipline, CALAW4 (pronounced "C-A-Law-Four") is a statewide channel available to any law-enforcement agency, and Med 9 (pronounced "Med-Nine") is used to coordinate medical communications between ambulance companies, the Orange County Chapter of the American Red Cross, and the State EMS Agency. A single-site repeater, known as Maroon Channel, is also available for use. Each of these channels is monitored 24/7 by Control One.

Control One is able to electronically connect the OC ACCESS U, CALAW4, Med 9, and Maroon radio channels to any conventional radio channel or 800 MHz Countywide Coordinated Communications System (CCCS) talkgroup, allowing for communications between users of these channels 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 these radio channels for a specific situation or incident being supported by the EOC or in the field with Control 7. While Orange County does not operate any repeaters for the UHF national interoperability channels, they are programmed into Control 7, should their use be needed. These channels are known as UTAC41 (pronounced "You-Tac-Forty-One"), UTAC42, and UTAC43.

Each of the UHF channels listed above, except OC ACCESS U and Maroon, may also be used in simplex mode. The



Screen shot of the Loma Ridge EOC public-safety radio console, inside the RACES radio room, showing some of the UHF channels.

channel names when in simplex mode are CALAW4D (pronounced "C-A-Law-Four-Direct"), Med9D (pronounced "Med-Nine-Direct"), UTAC41D (pronounced "You-Tac-Forty-One-Direct"), UTAC42D, and UTAC43D. An Orange County specific UHF simplex channel is also available for use by any discipline, known as Amber-TA. RACES members may be asked to monitor any of these simplex channels in the field, perhaps from the Control 7 communications response vehicle.

Finally, Control 7 is programmed with a number of private UHF channels, by agreement with the organization. For example, several channels used by the Orange County Chapter of the American Red Cross are available, and RACES members may be asked to monitor one of these channels from the Control 7 communications response vehicle.

This completes our review of the UHF Band. Next month we will continue our journey by taking a look at the 700 MHz Band.



Control 7 radio operator position.

Next OCRACES Meeting: October 4 on Teams

Our next OCRACES meeting will be on Monday, October 4, 2021, at 7:30 PM. Joe Selikov, KB6EID, will host this 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 and EmComm units are invited to attend this meeting.

At this meeting, we will review the October 2nd City/County RACES & EmComm ACS Exercise. We will especially focus on simplex coverage of the county, Winlink successes, and AREDN mesh, which is the first time we have incorporated that important technology into an OCRACES City/County exercise.

ARRL Provides Free RF Exposure Calculator

The FCC has adopted guidelines and procedures for evaluating environmental effects of RF emissions. Under the new FCC rules, some amateurs need to perform routine station evaluations to ensure that their stations comply with the RF exposure rules. This can be as simple as running an online calculator to determine the minimum safe distance between any part of your antenna and areas where people might be exposed to RF energy from your station. Although amateurs can make measurements of their stations, evaluations can also be done by calculation.



The FCC guidelines already incorporate two tiers of exposure limits based on whether exposure occurs in an occupational or “controlled” situation, or whether the general population is exposed or exposure is in an “uncontrolled” situation.

To make this easy for amateurs, ARRL now provides an RF exposure calculator at <http://arrl.org/rf-exposure-calculator> on its RF Exposure page. To use the calculator, enter your transmit peak-envelope power (PEP) and operating mode, and answer the questions about the maximum amount of time you might be transmitting. The calculator will give you the minimum distance people must be from your antenna and human exposure.

You can print the results and keep them in your station records. There is no requirement to send your results to the FCC.

U.S. 8-Meter Experimental Station on the Air

[WL2XUP](#) is an FCC Part 5 Experimental station operated by Lin Holcomb, N14Y, in Georgia. It’s licensed to operate with up to 400 W effective radiated power (ERP) between 40.660 MHz to 40.700 MHz.

John Desmond, EI7GL, reports that as of mid-July, WL2XUP was intermittently transmitting on Weak-Signal Propagation Reporter (WSPR) on 40.662 MHz (1500 Hz) for 2 minutes out of every 10, with an output power of 20 W ERP into an omnidirectional antenna. For FT8 check-ins and tests, an ERP of 100 W may be used. The band is affected by several propagation modes, including tropospheric ducting, sporadic E, transequatorial propagation (TEP), and F2 propagation. As Desmond notes, the 40 MHz band will open a lot earlier than 50 MHz and could be a useful resource for stations monitoring the transatlantic path.



A 2019 *Petition for Rulemaking* ([RM-11843](#)) asked the FCC to create a new 8-meter amateur radio allocation on a secondary basis. The Petition suggests the new band could be centered on an industrial-scientific-medical (ISM) segment somewhere between 40.51 and 40.70 MHz. The spectrum between 40 and 41 MHz is currently allocated to the federal government and, as such, within the purview of the National Telecommunications and Information Administration ([NTIA](#)).

ARRL member Michelle Bradley, KU3N, of Maryland, filed the petition on behalf of REC Networks, which she founded and described in the *Petition* as “a leading advocate for a citizen’s access to spectrum,” including amateur radio spectrum.

Thanks to ARRL.

PSR Meeting: Tuesday, October 19

OCSD Sgt. Jason McLennan announced that an “all hands” PSR meeting will be held on Tuesday, October 19, 1920, from 1800 to 2000 hours, at the Orange County Sheriff’s Regional Training Academy, 15991 Armstrong Ave., in Tustin. At this meeting, Sgt. McLennan will introduce himself, set expectations, and hear thoughts, ideas, and concerns going forward. There will also be a training portion.

RACES PSRs are reminded to register for this event on the Reserve Tracker Calendar. It is important not only to register for scheduled events and meetings but also to manually log your hours for any RACES activities, such as weekly net check-ins (one-half hour for each check-in), time in the EOC RACES Room, attending webinars on emergency preparedness, etc. PSRs are required to log at least 10 hours per month (120 hours per year) to remain in the Department (and as OCRACES members), so be diligent about using the Reserve Tracker User Time Entry.

City/County ACS Exercise: October 2

The next City/County RACES & EmComm ACS Exercise will be on Saturday, October 2, 2021, from 0900 to 1130 hours (30 minutes longer than previous drills). We will focus again on portable operations, especially testing coverage throughout Orange County, plus we will include Winlink and AREDN (Amateur Radio Emergency Data Network using mesh nodes).

The voice communications portion of the exercise will simulate repeater failure and will be conducted only on 2 meters simplex and 60 meters. Most stations (except net control) will operate portable. Net control will be at the Orange County EOC on Loma Ridge. During the first 30 minutes of the exercise, from 0900 to 0930 hours, OCRACES will call only its own members, on 146.595 MHz simplex, and each city RACES and MOU or other EmComm unit will call its members on their primary simplex frequency. From 0930 to 1030 hours, OCRACES net control will call the roll of City RACES and EmComm units on 146.595 MHz simplex. The designated member of each unit will respond, with a report of the number of stations that checked in on the unit’s primary simplex frequency. After the roll call, net control will stand by for any other radio amateurs who wish to participate.

From 1000 to 1030 hours, OCRACES net control will run a net on 60 meters channel 4 (5371.5 kHz dial frequency, upper sideband), using the same roll call of Orange County City and County RACES and EmComm stations as on the Saturday morning OCRACES ACS net. This half hour will run concurrent with the last half hour of the 2-meter simplex net. At about 1030 hours and until 1130 hours, net control will call for additional RACES and EmComm stations in Orange County that were not on the weekly Saturday roll call. Relay stations inside and outside Orange County will assist OCRACES net control in covering various areas of Orange County. OCRACES net control will then call the roll of RACES/ACS stations outside Orange County, using the weekly Saturday roll call. OCRACES net control will then call the roll of non-EmComm stations. Finally, net control will stand by for visitors who wish to participate.

The Winlink portion of the exercise is open to all licensed radio amateurs. Participants will use Winlink Express software, which is a free download from <https://winlink.org>. Communications may be via a Winlink RMS (Radio Message Server) gateway by RF or via telnet (direct internet connection). Messages will be transmitted with an attached check-in form, using a template built into Winlink Express under “Standard Templates,” then “GENERAL Forms,” then “Winlink Check In.txt.” Detailed instructions for creating a message with the Check In form, as well as sending it, are posted on the ocsd-races.groups.io website. In the left navigation menu, click the Files entry, click on the Winlink folder, and then click on the file WinlinkMessageForm_2021Oct02_V1.pdf to download it. Winlink messages will be accepted for the 24 hour period from 3:00 pm Friday through 3:00 pm Saturday).

The AREDN portion of the exercise, running from 1030 to 1200 hours on Saturday, will determine which County and City RACES units and EmComm organizations can pass traffic or establish VoIP phone calls using the Orange County AREDN network. It will also determine which of these units and organizations can monitor and capture images from a camera on the OC AREDN network. The exercise will also determine which RACES units and EmComm organizations can send a Winlink message with an attachment, using the OC AREDN network as the Winlink telnet transport layer. The AREDN portion is open to all radio amateurs having access to the Orange County AREDN network. To participate in the VoIP objective, the participant must also have a VoIP phone attached to their node or use a smartphone app such as Lincphone. To participate in the Winlink objective, the participant must also have Winlink Express pre-installed on their computer. Net control for the AREDN portion of the exercise will be from an AREDN mesh node (using a hot spot) at Loma Ridge. Access can be via RF or an internet tunnel.

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.**

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Huntington Beach RACES

Huntington Beach RACES will provide communications support to the Pacific Airshow on October 1-3, 2021, which runs from 10:30 AM to 4:30 PM each day. Costa Mesa RACES (MESAC) will assist HBRACES at this event. The 5th annual show line-up will feature the U.S. Navy Blue Angels, the Canadian Forces Snowbirds, U.S. Army Golden Knights, U.S. Air Force ACC F-35 Demo Team, the U.S. Marine Corps V-22 Osprey Demo Team, and the U.S. Navy EA-18G Growler Legacy Flight Team. The Pacific Airshow is free to the public, although upgraded seating options are available for purchase. Show center is located on Pacific Coast Highway and Huntington Street. Anywhere along the beach north and south of this location will be ideal for viewing the show.

Placentia RACES

Placentia RACES will provide communications support to the 59th Annual Placentia Heritage Festival and Parade on Saturday, October 9, 2021. The event begins at 7:00 AM with a pancake breakfast. The festivities at Tri-City Park will start at 10:00 AM and include family games, inflatables, food booths, crafters, home-based businesses, a business expo, and a variety of non-profit displays. The event will also feature the 34th Annual Heritage Festival Car Show.

Seal Beach RACES

Dick Crowe, KG6XJ, will be the next Seal Beach RACES Chief Radio Officer. Dave Sansenbach, KM6CNF, will be the Assistant Radio Officer.

OCSD PSRs

All OCSD Professional Services Responders (PSRs), including RACES PSRs, are reminded to register on the Reserve Tracker Calendar for the PSR Meeting on Tuesday, October 19, 2021. The meeting will run from 6:00 PM to 8:00 PM at the Orange County Sheriff's Regional Training Academy, 15991 Armstrong Avenue, in Tustin. It will showcase and provide insight

on the future of the PSR program.

PSRs and sworn Reserve Deputies are required to take a CPR class once every two years. Classes are scheduled on the Reserve Tracker Calendar. The next CPR training is on Saturday, October 23, 2021, from 8:00 AM to 5:00 PM, at the Sandra Hutchens Regional Law Enforcement Training Center, 1900 W. Katella Avenue, in Orange.

Orange County SKYWARN

At 3:36 PM on Friday, September 24, 2021, the National Weather Service issued an alert that "Strong thunderstorms will affect much of Orange County through 6 PM." Just prior to that alert, Orange County SKYWARN Coordinator Scott O'Donnell, WX6STO, activated SKYWARN for Orange County, but said, "PLEASE STAY HOME (if possible)." At 3:36 PM, Doppler radar was tracking strong thunderstorms over El Toro, near Mission Viejo, moving west at 20 mph. Locations impacted much of Orange County. NWS said, "If outdoors, consider seeking shelter inside a building. Torrential rainfall is also occurring with this storm and may lead to localized flooding. Do not drive your vehicle through flooded roadways. Frequent cloud-to-cloud lightning is occurring with this storm. Seek a safe shelter inside a building or vehicle."

Scott said NWS needed critical weather reports from spotters' homes. Flooding and heavy rainfall measurements in a short amount of time were requested. Wind gusts exceeding 40 mph and funnel clouds were also to be reported. Photos were requested.

At 5:23 PM, NWS said SKYWARN could stand down for the evening.

Orange County Amateur Radio Club

The next OCARC general meeting will be on Friday, October 15, 2021, at 1900 hours, on Zoom. Club members will receive Zoom sign-on information prior to the meeting. During the meeting, Ken Konechy, W6HHC, will talk on end-fed half-wave (EFHW) antennas, which are a multiband HF design. They are simple and relative low cost, compared to commercial multiband beams and vertical antennas.

October 2021

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

Upcoming Events:

- **October 2:** City/County RACES & EmComm ACS Exercise
- **October 4:** OCRACES Meeting on Microsoft Teams, 1930 hours
- **October 14:** Orientation for PSRs, Sheriff's Academy, 1830 hours
- **October 15:** Orange County Amateur Radio Club Meeting on Zoom, 1900 hours
- **October 19:** PSR Meeting, Sheriff's Academy, 1800-2000 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 (down for repair)
- 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)
- *Primary Net—Mondays, 1900 hours

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Visit Our Web Site
<https://ocraces.org>
It's Where It's @!

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**“W6ACS ...
Serving
Orange County”**

Meet Your County of Orange RACES Members!

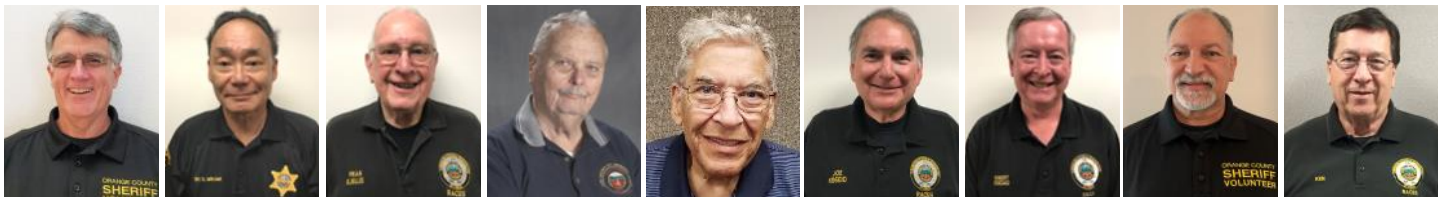
Officers →



Ken Bourne W6HK Scott Byington KC6MMF Jack Barth AB6VC Ernest Fierheller KG6LXT



Heide Aguire K3TOG Randy Benicky N6PRL Eric Bowen W6RTR Ray Grimes N8RG Peter Jimenez K16UTE Walter Kroy KC6HAM Martin La Rocque N6NTH Steve Livingston NJ6R



Scott MacGillivray KM6RTE Don Mikami N6ELD Fran Needham KJ6UJS Harvey Packard KM6BV John Pilger K6PIO Joe Selikov KB6EID Robert Stoffel KD6DAQ Chuck Streitz KK6HFS Ken Tucker WF6F

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