March 2025

County of Orange RACES
NetControl

Newsletter of the County of Orange Radio Amateur Civil Emergency Service

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

AM and Selective Fading on HF

Next OCRACES Meeting

Monday,
March 3, 2025
on Zoom

Severe Fire Weather Patrol Training

Orange County Sheriff's Department
Emergency Management Division

I miss the "good old days" on HF. I had many enjoyable rag chews on 10 and 15 meters AM back in the 1950s and '60s. There was very little "doubling" compared to today's single-sideband QSOs, because you could tell during a pause if the ham was still transmitting, because his carrier was still detected. On SSB, you don't know if he is pausing or listening—or if he released PTT or is using VOX. Those HF AM transmissions sounded so good and natural. SSB transmissions have their advantages, such as power efficiency, spectrum efficiency, and better copy under weak signal conditions, but they don't sound as natural, especially if you don't tune precisely to their operating frequency.

I was disappointed when Collins introduced its high-end S-Line equipment without AM capabilities. However, most modern HF transceivers provide that mode, which sounds pretty good, but you can't beat vintage "boat anchor" transmitters and receivers for the best AM sound quality. Here are some common frequencies where you can join in on the enjoyment of AM QSOs:

- 160 meters: 1.885, 1.900, 1.945, 1.985 MHz
- 75 meters: 3.870 MHz
- 40 meters: 7.290, 7.295 MHz
- 20 meters: 14.286 MHz
- 17 meters: 18.150 MHz
- 15 meters: 21.285, 21.425 MHz
- 10 meters: 29.000-29.200 MHz
- 6 meters: 50.4 MHz

AM sounds great when working local stations, but a phenomenon called *selective fading* can add varying distortion when working distant "skip" stations—signals being refracted by the ionosphere.

Selective fading occurs when different parts of a transmitted signal arrive at the receiver via varying ionospheric paths, causing certain frequencies within the signal to be out of phase with each other. This can lead to distortion and fluctuations in signal strength. (This is minimal on SSB, which is another advantage of SSB over AM.)

AM signals are particularly susceptible to selective fading. This is because an AM signal's strength is directly associated with its amplitude, which can be significantly affected by ionospheric fading. Locally, an AM signal can flutter due to reflections off of passing aircraft. During long-distance QSOs, ionospheric fading will attenuate different parts of the AM signal's frequency spectrum, resulting in distortion.

The only HF FM activity is at the high end of 10 meters, such as 29.600 MHz, plus repeater outputs at 29.620, 29.640, 29,660, and 29.680 MHz. FM signals are generally more resistant to selective fading compared to AM signals. This is because the information in an FM signal is embedded in the frequency variations, not the amplitude, so changes in amplitude due to selective fading have less of an impact. FM signals can still experience some distortion due to multipath propagation. ✦

Yaesu FTM-510DRASP Digital/FM Dual-Band

The Yaesu FTM-510DRASP C4FM digital/FM 144/430 MHz dual-band mobile transceiver offers 55 watts (VHF) and 50 watts (UHF) transmit power. As an advanced version of the FTM-500DR, it provides improved reception quality and enhanced user-friendliness with new features.

The "Super DX" function, available in both C4FM digital and FM analog modes, increases the sensitivity of the RF amplifier, improving the reception of weak signals. The "ASP" (Audio Digital Signal Processor), activated in FM analog mode, filters out noise from FM signals for clearer audio reproduction. The ASP AUTO mode automatically activates this function when weak signals are detected.

Other improvements over the FTM-500 include the PMG system, which automatically adjusts the received signal display, hiding historical signals after 2 seconds. New PMG scan modes automatically detect and simultaneously play up to two active channels. The My Group (M-GRP) function, which is a new feature in the

Yaesu FTM-510DRASP digital/FM radio.

MAG system, allows flexible selection of memory channels regardless of the frequency band.

It has a dual front speaker with AESS (Acoustic Enhanced Speaker System). ✦

Icom IC-2730B Black Edition Dual-Band Radio

The Icom IC-2730B Black Edition dual-band VHF/UHF transceiver features a new high-contrast black LCD display for improved visibility. Power output is 50 watts covering the 2-m (144-148 MHz) and 70-cm (430-450 MHz) bands. It is equipped with an HM-207 remote-control hand mic. An optional VS-3 Bluetooth headset is available and requires a UT-133/A Bluetooth module to be installed in the radio. ✦

Icom IC-2730B Black Edition dual-band VHF/UHF transceiver.

Connect Systems CS7000 M17 PLUS Radio

The Connect Systems CS7000 M17 PLUS is the first amateur digital radio that has the ability to have multiple digital protocols in a single radio. This first version has DMR, M17, and analog FM protocols. (See pages 1 and 2 of the August 2024 issue of *NetControl* for a description of the M17 digital protocol.)

Its 2-megabyte program memory allows the CS7000 to have DMR, analog, M17, and other protocols such as D-STAR, P25, etc. Its 1-megabyte RAM allows the radio to overlay large programs unique to different protocols.

Connect Systems claims the radio's processor is three times faster than what is normally used in DMR radios, to allow the ability to develop new algorithms to advance the state of the art of communications and allow the radio to work better than the commercial radios that are currently sold.

The CS7000 M17 PLUS provides the ability to easily get in the native boot mode of the microprocessor to unbrick the radio without opening the radio. Connect Systems says this is important when developing new features because of the chance of bricking the radio.

The CS7000 M17 PLUS has built-in GPS, Bluetooth, man-down sensor, and vibrator.

The radio features a dual-conversion superheterodyne receiver and front-end varactor tuning. Frequency coverage is 400 MHz to 512 MHz. It has IP67 waterproof rating. Included is a 2400-mAh battery with belt clip. The 1.8-inch color display is 160 x 128. A programming cable is included, as well as a power supply and charger.

Features include voice auto record, channel voice annunciation, CTCSS/DCS encode and decode, DTMF/MDC1200/2-tone/5-tone encode and decode, dual priority scan, and VOX. ✦

Connect Systems CS7000 M17 PLUS multiple-protocol UHF radio.

Kenwood TM-D750A Digital Triband Radio

Kenwood introduced its TM-D750A digital triband mobile transceiver that operates across the 2-meter, 1.25-meter, and 70-centimeter amateur bands. Awaiting FCC approval, features and specifications are pre-release and subject to change.

The TM-D750A is APRS protocol compliant for real-time 2-way data communications. It is D-STAR digital protocol compatible, and includes Bluetooth, USB, and wireless LAN. The D-STAR network can be accessed directly using Direct Mode, without the need for external devices. In Reflector Terminal Mode, the built-in MMDVM command enables easy access to D-STAR reflectors via a Windows PC or Android device using a USB connection or Bluetooth.

Dual simultaneous signal reception is provided for digital voice and data. A built-in KISS TNC supports APRS operations with a standalone digipeater function. PC connection enables 1200/9600 bps packet communications and iGate station operation.

The remote operation panel with multiple knobs and push buttons has a 3.45-inch TFT color LCD and built-in

Kenwood TM-D750A digital triband mobile transceiver.

speaker. The transceiver has a built-in GPS module and patch antenna.

Connectivity is provided with a USB-C port and microSD card slot on both the remote head and RF deck.

Voice guidance features include 4-step variable speed and over 900 phrases. ✦

Yaesu FTX-1F HF/VHF/UHF All-Mode QRP Rig

The new Yaesu FTX-1F HF/50/144/430 MHz all-mode QRP portable transceiver is designed with SDR technology and provides 6 watts of output power. Its 5670-mAh lithium-ion battery pack enables 9 hours of standalone SSB operating time on the HF bands and 8 hours of operating time on the VHF/UHF bands, FM mode (based on a 6-6-48 duty cycle). Up to 10 watts of power output is available when using an external DC power supply. Two speakers are provided.

Operating modes include SSB, CW, AM, FM, and C4FM digital. It is WIRES-X compatible. It uses SDR technology and has 3DSS (3-dimensional spectrum stream), with a 4.3-inch touchscreen display.

Two independent receiver circuits provide true simultaneous dual-band operation, whether in the same band or in different bands. For example, you can run SSB on HF bands and C4FM digital communications on VHF/UHF bands.

An optional automatic antenna tuner (sold separately) can be attached to the rear of the transceiver with the battery pack. An optional cooling fan, which is necessary for FT8 operation, can also be combined with the antenna tuner.

Yaesu FTX-1F HF/50/144/430 MHz all-mode QRP portable transceiver.

The RF front-end and low-noise reference oscillator enable excellent multi-signal receiving characteristics. QRM rejection is effective with high-speed 32-bit IF DSP.

With the PMG (Primary Memory Group) function, you can register and monitor up to five frequently used frequencies. The MAG (Memory Auto Grouping) function enables memory channels to be categorized in each band that can be quickly recalled by band groups (HF/VHF/UHF/AIR/others).

USB ports support CAT operation, audio input/output, and TX control. ✦

Next OCRACES Meeting: March 3 on Zoom

Severe Fire Weather Patrol training will be included at the next OCRACES meeting, which will be on Monday, March 3, 2025, at 7:30 p.m., on Zoom. The training will be conducted by Renalynn Funtanilla, Orange County

Fire Watch Program Coordinator—Fire Prevention & Management, Irvine Ranch Conservancy. City RACES members may also attend. RACES PSRs may register for this meeting on the InTime Calendar. ✦

Emergency Preparedness Act Re-Introduced

WASHINGTON—U.S. Senators Roger Wicker, R-Miss., and Richard Blumenthal, D-Conn., and Representatives August Pfluger, R-Tex., and Joe Courtney, D-Conn., announced their joint re-introduction of legislation in the Senate and House to restore the right to amateur radio operators to install the antennas necessary to serve their communities.

Homeowner association rules often prevent amateur radio operators from installing antennas at their homes even though amateur radio has proven to be essential in emergencies and natural disasters such as hurricanes when other means of communication fail.

"Mississippians should have access to every possible means of warning for natural disasters, including amateur radio operators. In an emergency, those warnings can mean the difference between life and death," Senator Wicker said. "The Amateur Radio Emergency Preparedness Act would remove unnecessary roadblocks that could help keep communities safe during emergencies like tornadoes, hurricanes, and fires."

"When disaster strikes, amateur radio operators provide vital, often life-saving information, which shouldn't be hindered by prohibitive rules or confusing approval processes. The Amateur Radio Emergency Preparedness Act eliminates obstacles for ham radio enthusiasts, allowing them to continue their communications and serve their communities in the face of emergencies," said Senator Blumenthal.

"Natural disasters and other emergency situations that hinder our regular lines of communication are unfortunately unavoidable, which is why we must bolster our emergency preparedness by removing the barriers amateur radio operators often run into when installing antennas. Amateur radio plays a vital role in public safety by delivering critical information to people at all times. My district is home to dozens of amateur radio operators ready to volunteer in the event of an emergency, and I am proud to lead this legislation," said Congressman August Pfluger.

"As we know from recent natural disasters, amateur radio operators in Connecticut can be a critical component of disaster response and emergency management. It is in our communities' best interest that we give them the capabilities to operate at the highest level, and with the re-introduction of this bill, we've taken a strong step in that direction," said Congressman Courtney.

Background:

The Amateur Radio Emergency Preparedness Act of 2025 (H.R. 1094 and S. 459) would require homeowner associations to accommodate the needs of FCC-licensed amateur radio operators by prohibiting the enforcement of private land use restrictions that ban, prevent, or require the approval of the installation or use of amateur radio station antennas. Homeowner associations have often prevented installation and use of such antennas through private land use restrictions. This has hindered voluntary training for emergency situations and blocked access to necessary communications when disaster strikes.

Among other provisions, this legislation would:

- Prohibit homeowner association rules that would prevent or ban Amateur Radio antennas;
- Specify an approval process for installing Amateur Radio antennas;
- Provide a Federal private right of action to Amateur Radio operators in disputed cases.

On behalf of America's amateur radio licensees, Rick Roderick, the President of The American Radio Relay League, re-confirmed the ARRL's full support for the passage of the Amateur Radio Emergency Preparedness Act of 2025 and extended his thanks and appreciation to Senators Wicker and Blumenthal and Congressmen Pfluger and Courtney for their unflagging leadership of the bi-partisan effort to support and protect the rights of all Amateur Radio Operators.

The text of the House version can be found at this link: H.R. 1094. ✦

RigExpert's Administrative Office Destroyed

Many county and city RACES members use RigExpert antenna and cable analyzers to adjust their antennas to resonance and lowest SWR. Because these popular instruments are manufactured in Ukraine, members have voiced concern that the war in that country might have disrupted or destroyed future availability of these analyzers. The ARRL reports that on February 12, 2025, RigExpert's administrative office, in Kyiv, Ukraine, was destroyed by a Russian ballistic missile. All employees are

reported to be safe. Officials said they are committed to restoring operations as soon as possible.

"Our top priority is the safety of our team and the continuity of our operations," said Ashot Andeev, Chief Executive Officer. "While our administrative office is in ruins, our production facilities survived, allowing us to continue serving our customers and partners." The company is working to minimize delays and fulfill its commitments while maintaining customer support operations. ✦

Do Not Use DeepSeek on RACES Computers!

RACES PSRs are warned not to use DeepSeek AI. In January 2025, a Chinese artificial-intelligence company called DeepSeek rolled out its AI app that plummeted shares of AI stalwarts such as Nvidia, a prominent manufacturer of advanced chips engineered for AI development. DeepSeek's low development costs were apparently only $6 million. By comparison, OpenAI, Google, and other major U.S. AI companies are reportedly investing a total of about $1 trillion in AI over the coming years.

Based in Hangzhou, Zhehiang, DeepSeek is owned and funded by the Chinese hedge fund High-Flyer. DeepSeek was founded in July 2023 by High-Flyer co-founder Liang Wenfeng, who also serves as the CEO for both companies. The company launched an eponymous chatbot alongside its DeepSeek-R1 model in January 2025.

Released under the MIT License, DeepSeek-R1 provides responses comparable to other large language models (LLMs), such as OpenAI's GPT-4o and o1. Its training cost is reported to be significantly lower than other LLMs. The company claims that it trained its V3 model for $6 million compared to $100 million for OpenAI's GPT-4 in 2023, and approximately one-tenth of the computing power used for Meta's comparable model, Llama 3.1. DeepSeek's success against larger and more established rivals has been described as "upending AI."

The low cost of training and running the language model was attributed to Chinese firms' lack of access to Nvidia chipsets, which were restricted by the US as part of the ongoing trade war between the two countries. This breakthrough in reducing expenses while increasing efficiency and maintaining the model's performance in the AI industry sent "shockwaves" through the market. It threatened the dominance of AI leaders like Nvidia and contributed to the largest drop in U.S. stock-market history, with Nvidia alone losing $600 billion in market value.

DeepSeek has built many open-source resources, including the LLM v3, which rivals the abilities of OpenAI's closed-source GPT-4o. Because this powerful technology is open and replicable, it provides an opportunity to use it more freely in malicious ways, such as to create bioweapons, launch large-scale phishing campaigns, or fill the internet with advanced spam.

A major concern centers on data. Most LLMs, including DeepSeek, are built upon sensitive or faulty databases, such as formation from data leaks of stolen biometrics.

DeepSeek is causing national security concerns in the U.S., over fears that its AI models could be used by the Chinese government to spy on American civilians, learn proprietary secrets, and wage influence campaigns. The National Security Council is considering the potential security implications of DeepSeek. The U.S. Navy has banned its personnel from using DeepSeek due to "potential security and ethical concerns."

There are concerns about how DeepSeek could use users' data. The company's privacy policy states that it automatically collects a large amount of input data from its users, including IP addresses and keystroke patterns, and may use that to train their models. Users' personal information is stored in "secure servers located in the People's Republic of China," the policy reads.

DeepSeek recently topped the Apple App Store in the U.S. RACES members who have downloaded this app are urged to delete it from their cell phones. Banning DeepSeek is similar to the in-limbo TikTok ban, as both are Chinese. One reason that TikTok was initially banned in the U.S. was due to concerns over how much data the app's Chinese parent company, ByteDance, was collecting from Americans.

DeepSeek is concerning because of its potential to promote Chinese values and political aims, or to be a tool for espionage or cyberattacks.

DeepSeek is a danger to users of iPhones and Android cell phones. In particular, the iOS app was discovered to transmit device information "in the clear" without any encryption to encapsulate the data. This means the data being handled by the app could be intercepted, read, and even modified by anyone who has access to any of the networks that carry the app's traffic.

The DeepSeek iOS app globally disables App Transport Security (ATS), which is an iOS platform level protection that prevents sensitive data from being sent over unencrypted channels. Since this protection is disabled, the app can (and does) send unencrypted data over the internet.

The app does selectively encrypt portions of the responses coming from DeepSeek servers. But mobile security company NowSecure also found it uses an insecure and now deprecated encryption algorithm called 3DES (aka Triple DES), and that the developers had hard-coded the encryption key. That means the cryptographic key needed to decipher those data fields can be extracted from the app itself.

U.S. congressional offices are warned not to use the app. A notice from the chief administrative officer for the House of Representatives states, "Threat actors are already exploiting DeepSeek to deliver malicious software and infect devices. To mitigate these risks, the House has taken security measures to restrict DeepSeek's functionality on all House-issued devices.

The Orange County Sheriff's Department has taken a similar step. Because DeepSeek poses significant security and compliance risks to County systems and data, RACES PSRs are prohibited from accessing the DeepSeek AI platform on any OCSD network computer, such as in the EOC RACES Room. Furthermore, RACES PSRs also must not access DeepSeek on non-network (OCRACES-only) computers in the RACES Room, and are urged not to access DeepSeek on their personal computers or install the DeepSeek app on their smartphones. ✦

Countywide RACES/EmComm News

Countywide Winlink P2P Exercise
by Scott MacGillivray, KM6RTE

Based on the successful previous exercises, the next countywide Winlink Peer-to-Peer (P2P) practice exercise is planned for the morning of Saturday, March 8th. This exercise provides an opportunity to gain experience using the Winlink P2P Operating Mode.

The exercise will again focus on sending a Winlink P2P message with an attached form to "Drill Ops" located at Loma Ridge in central Orange County. Details are fully described in the instructions currently being finalized and will be distributed prior to the exercise.

It is important to note that this is an informal practice exercise (organized by me) and not associated with any organization. Your participation is solely for your own personal benefit, and the exercise is not to conflict with any official city or county government activities.

Importance of Winlink P2P. For those not familiar with Winlink P2P, it is one of the four Operating Modes that Winlink supports and does not rely on intermediate Radio Message Server (RMS) or "gateway" for connection to the internet. It is valuable to understand how to operate this mode since it is expected to be a critical Winlink mode used after a major disaster when phone, text, and internet services are not available in our area. I highly recommend that you take advantage of this exercise to gain experience with P2P. However, make sure your Winlink equipment can operate using Conventional Mode (i.e., using a local "gateway") before participating in this drill. The main purpose of this drill is not to verify that your Winlink equipment works, but instead focuses on becoming familiar with how to operate P2P mode.

You are encouraged to mention this article to other individuals and organizations that you feel might be interested in taking advantage of this practice exercise. This includes any operators that can reach Loma Ridge directly or through a Winlink gateway operating as a relay.

For more information on Winlink Global Radio Email: https://www.winlink.org.

Orange County Amateur Radio Club (OCARC)

The next meeting of the Orange County Amateur Radio Club (OCARC) will be on Friday, March 21, 2025, at 7:00 p.m. at the American Red Cross (George M. Chitty Building), 600 Parkcenter Drive, in Santa Ana. The March speaker will be Michael Rickey, AF6FM. He will be talking on "Meshtastic" mesh networking system for amateur radio.

Current Air Quality

If you are RACES-activated, especially in the field, you may wish to check local air quality before you are deployed. You may wish to include a breathing mask in your go-kit. Air quality may be checked on the AirNow app or online at https://www.airnow.gov. The website and app highlights air quality in your local area first, while providing air quality information at state, national, and world views. AirNow's interactive map even lets you zoom out to get the big picture or drill down to see data for a single air quality monitor. AirNow's Fire and Smoke map, a collaborative project with the U.S. Forest Service, uses a variety of products including low-cost sensors to provide detailed, up-to-date information that can be critical to users experiencing smoke events.

AirNow reports air quality using the official U.S. Air Quality Index (AQI), a color-coded index designed to communicate whether air quality is healthy or unhealthy for you. When you know the AQI in your area, you can take steps to protect your health.

AirNow is a partnership of the U.S. Environmental Protection Agency, National Oceanic and Atmospheric Administration (NOAA), National Park Service, NASA, Centers for Disease Control, and tribal, state, and local air quality agencies. Agencies all over the country send their monitoring data to AirNow for display. The Department of State provides data from U.S. Embassies and Consulates to inform personnel and citizens overseas, and the U.S. Forest Service and NOAA provide fire and smoke data.

March 2025

Sun	Mon	Tue	Wed	Thu	Fri	Sat
						1 Weekly 60 m ACS Net
2	3 Weekly 2 m ACS Net & OCRACES Meeting	4	5	6	7	8 Weekly 60 m ACS Net & Winlink P2P Exercise
9 Daylight Saving Time Begins	10 Weekly 2 m ACS Net	11	12	13	14	15 Weekly 60 m ACS Net
16	17 Weekly 2 m ACS net	18	19	20	21 Orange County Amateur Radio Club Meeting	22 Weekly 60 m ACS Net
23	24 ACS Nets on 2 m & 70 cm	25	26	27	28	29 Weekly 60 m ACS Net
30	31 Weekly 2 m ACS Net					

Upcoming Events:

- **March 3, 1930-2130 hours:** OCRACES Meeting on Zoom; Severe Fire Weather Patrol Training
- **March 8:** Winlink P2P Exercise (not official OCRACES)
- **March 9:** 0200 hours: Daylight Saving Time begins.
- **March 21, 1900 hours:** Orange County Amateur Radio Club meeting, American Red Cross (George M. Chitty Building), 600 Parkcenter Drive, Santa Ana

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)
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 (down for repair)
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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Questions or Comments?
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"W6ACS ...
Serving
Orange County"

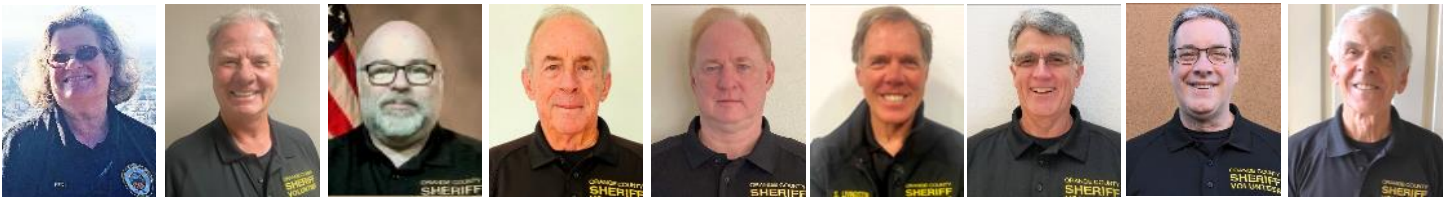# *Meet Your County of Orange RACES Members!*

Officers →

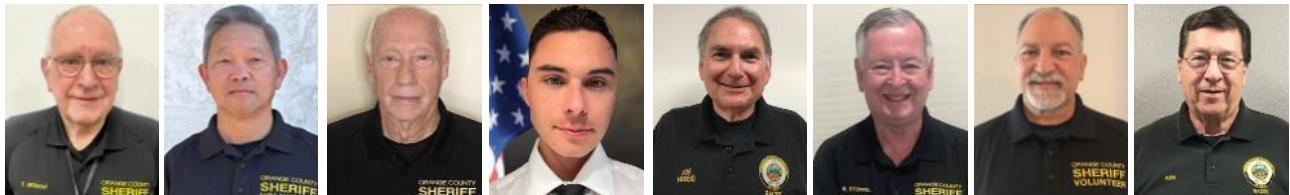| Ken Bourne W6HK | Scott Byington KC6MMF | Randy Benicky N6PRL |

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