March 2026

Newsletter of the County of Orange Radio Amateur Civil Emergency Service

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**Next OCRACES Meeting**

**for OCRACES Members Only**

**Thursday, March 5, 2026, at 7:00 p.m., on Zoom**

# CRO's Nest

## *by Ken Bourne, W6HK, Chief Radio Officer Emeritus*

### Counterpoise for Half-Wave Verticals and End-Feds

Several years ago I discovered that the local Sears store was phasing out its stock of CB radios and accessories, including antennas at a very low price. One of those antennas was a new half-wave 11-meter vertical for only $15.00. It was about 16.5 feet high. (An electrical half wave would be 17.34 feet, but velocity factor of the aluminum tubing would need to be considered, which is about 95 percent, or 16.5 feet.) Having no interest in CB, I immediately thought that I could easily modify the antenna for 10 meters and maybe it would provide some gain over a quarter-wave vertical. So I bought it and removed a few inches from the vertical element until it achieved resonance around the middle of 10 meters. It worked great, and I discovered it performed very well as a quarter-wave vertical on 20 meters.

You might wonder why I shortened the antenna for 10 meters, rather than trying to make it work as a 5/8-wave antenna, which has more gain. (A half-wave vertical has 0.7 to 1.2 dB gain over a quarter-wave, whereas a 5/8-wave vertical has 1.5 to 2.0 dB gain.) However, even at the high end of 10 meters, where I was considering using it on 29.6 MHz FM, a 5/8-wave antenna would be 18.7 feet tall (considering velocity factor). In the middle of 10 meters, it would need to be 19.5 feet tall. It's easier to shorten an antenna, rather than lengthen it!

Quarter-wave vertical antennas normally have counterpoise radials that are also a quarter wave, which would be about 96 inches on 10 meters. But this half-wave antenna had some short horizontal stubs instead. Short radials on a half-wave vertical antenna serve a nuanced but important role in shaping the antenna's electrical environment, even though a half-wave vertical doesn't require a traditional ground radial system like a quarter-wave vertical does.

Short radials on a half-wave vertical stabilize the feed-point impedance. Even though a half-wave antenna is voltage-fed at the base (high impedance), short radials help stabilize the impedance by providing a consistent reference potential. This improves matching and reduces variability due to ground conditions.

Short radials reduce common-mode currents. Without radials or a proper counterpoise, RF can travel back down the feedline as common-mode current, leading to unwanted radiation, interference, and unpredictable patterns. Short radials act as a counterpoise, helping to suppress this.

Short radials improve radiation pattern symmetry. While the antenna itself radiates most of the energy, short radials help maintain a balanced current distribution, which can slightly improve the symmetry and elevation angle of the radiation pattern.

Short radials minimize ground losses. Even though the half-wave doesn't rely on ground return like a quarter-wave, any interaction with lossy ground can degrade performance. Short radials lift the current

*(Continued on page 2*

# CRO's Nest Continued from page 1

node slightly above ground, reducing coupling to lossy earth.

Half-wave verticals typically have two to four radials (mine has three), each 0.05 to 0.15 wavelength long and arranged symmetrically around the base. They are elevated above ground or laid flat, depending on the installation.

To summarize, these radials aren't about completing a ground return—they're about controlling the feed environment, improving efficiency, and reducing unwanted RF behavior. They are useful for optimizing antenna performance.

Because a half-wave vertical is twice as tall as a quarter-wave, you might wonder why it doesn't have twice the gain (3 dB). It does **not** double the radiated power in the main lobe. Its current distribution is not uniform. The pattern only slightly compresses toward the bottom. Real-world matching losses often eat part of the theoretical advantage. As a result, the gain is approximately 1 dB rather than 3 dB.

### 5/8-Wave Vertical Antennas

At 2 meters or 70 centimeters, 5/8-wave vertical antennas are more common than half-wave antennas because of higher gain. They both have short radials, rather than quarter-wave radials for a quarter-wave vertical. The added length, which is not that much longer on those bands, does not contribute much to gain. Rather, its current distribution and radiation pattern are optimized for maximum low-angle radiation. A half-wave has a nice low-angle lobe, but still wastes some energy upward. A 5/8-wave produces a stronger, flatter lobe right at the horizon, improving ground wave and DX performance, and giving approximately 1.5 to 2 dB advantage over a quarter wave and 0.5 to 1 dB advantage over a half-wave.

The 5/8-wave element is the longest you can make a single vertical radiator before the pattern breaks down. A longer element produces high-angle lobes, which ruin the low-angle gain. However, stacking two 5/8-wave element would give an additional 2 to 2.5 dB gain, rather than a full 3 dB because of not-ideal current distribution and phasing/matching losses.

### Horizontal Half-Wave End-Fed

The theory behind short radials or counterpoise elements in an HF horizontal half-wave end-fed antenna (EFHW) is quite similar to the half-wave vertical. Even though the EFHW is a resonant antenna and doesn't require a traditional ground plane, it still benefits from a counterpoise or grounding strategy to manage feed-point behavior and suppress unwanted currents.

A counterpoise helps in an EFHW antenna, which is fed at one end at a high-impedance point (typically 2,000 to 5,000 ohms), often through a 49:1 or 64:1 transformer. This end is also a voltage maximum, which makes it sensitive to grounding and nearby conductive objects.

Without a counterpoise, the coax shield or feedline can act as the return path for RF current, leading to common-mode radiation, RFI, and unpredictable patterns. A short counterpoise helps redirect this current away from the feedline.

A counterpoise provides improved matching and efficiency. It provides a more stable electrical reference, which can improve the transformer's performance and reduce losses. It also helps maintain consistent impedance across different installations.

Especially in portable or stealth setups, the lack of a counterpoise can cause the antenna to interact with nearby metal, trees, or buildings. A counterpoise helps isolate the antenna system from these influences.

The length of an EFHW counterpoise is typically 0.05 to 0.15 wavelength (e.g., ~6 to 20 feet on the 40-meter band). The counterpoise can be laid on the ground, elevated, or even coiled loosely. Often just one wire is sufficient, but adding a second can help in noisy environments.

As an alternative, a good RF choke or isolator (1:1 balun or ferrite beads) on the feedline can also help suppress common mode currents if a counterpoise isn't feasible.

Even though a resonant EFHW doesn't "need" a ground plane, RF always seeks a return path. A short counterpoise or radial gives it a clean, predictable one—improving performance, reducing interference, and protecting your radio.

Some participants in the OCRACES 60-meter net on Saturdays at 10:00 a.m. use an EFHW, which is about 98 feet long (compared to 88 feet for a half-wave dipole). Feedpoint impedance is very high but predictable when using a 49:1 or 64:1 transformer and maybe a small series capacitor. In most cases, it is resonant, but a tuner might help. Its radiation pattern is similar to a half-wave dipole at 0.15 to 0.2 wavelength above ground, which is ideal for Near Vertical Incidence Skywave (NVIS), which is necessary for the OCRACES net coverage throughout the Cal OES Southern Region and beyond.

A 5/8-wave end-fed antenna on 60 meters would be about 123 feet long, and its pattern is also mostly NVIS/high-angle. It acts like a slightly long dipole with a bit more pattern complexity (some azimuth lobes/nulls). The impedance is high and reactive. It needs a tuner, and the transformer ratio is unpredictable. It's probably not worth the time and effort to try to make it work (probably no more effectively than an EFHW), and it requires a larger lot size. ✸

# World Amateur Radio Day: April 18th

Ham Radio Open House for World Amateur Radio Day 2026 will involve all amateur radio operators worldwide on Friday, April 18, 2026, at 0000 UTC until Saturday, April 19, 2026, at 0000 UTC, but the Ham Radio Open House can be held any time in April by local amateur radio clubs. This global event will cover all regions of the International Amateur Radio Union (IARU)

World Amateur Radio Day, held on April 18 each year, is celebrated worldwide by radio amateurs and their national associations, which are organized as member-societies of the IARU. It was on this day in 1925 that the IARU was formed in Paris. American Radio Relay League (ARRL) Co-Founder Hiram Percy Maxim was its first president.

It's the Year of the Club and the second annual ARRL Ham Radio Open House event in April. It offers clubs a chance to show off their hi-tech gear and skills to their community. As an auxiliary communications unit of the Orange County Sheriff's Department, Emergency Management Division and Mutual Aid Bureau, OCRACES is not a club, but encourages local radio-club members to be actively involved in emergency communications.

ARRL is encouraging radio clubs and schools to help promote amateur radio science and technology by opening their stations to the public with an open house during the month of April. In addition, groups are encouraged to set up in public places or conduct outdoor activities, such as a Parks on the Air (POTA) activation or satellite contact. The event is built around World Amateur Radio Day on Saturday, April 18. OCRACES also invites the public to some of its promotional/operational events, such Field Day and the recent Go-Kit Event at the Sheriff's Academy parking lot on December 6, 2025.

Ham Radio Open House is intended to highlight the Amateur Radio Service for its development and practice of the latest radio communications and technology, and as a hands-on pathway into science, technology, engineering, and mathematics (STEM) fields for the next generation. This is a chance to not only shape the conversation about modern ham radio but also to show how it serves as a steppingstone and testbed for many young people pursing STEM education and future high-tech careers.

Find out more about World Amateur Radio Day by checking the IARU website and their Region 2 website. ✸

# Digital or Paper?

In a digital world, everything works correctly. But what happens when it doesn't? The following is an experience of an amateur radio club in Ohio, but is also applicable to RACES units, which are not clubs, but rather are auxiliary communications units of government agencies.

Tina Milenovic, K8RBQ, a member of the All Things Amateur Radio Association (ATARA) in Lancaster, Ohio, said her club began asking that question a couple of years ago. "What happens in a grid-down situation, when the internet, tablets, laptops, and GPS are not available? In an emergency, how can first-responders quickly navigate and travel to their intended destinations?" Milenovic said that after some thought and discussion, the answer was, well, old school ... use paper maps!

In 2023, members of ATARA began contacting the county engineer offices of Fairfield and contiguous counties to acquire fold-out, paper county maps for their Off Grid team members. The Off Grid team trains to be able to respond and provide mission-essential emergency communications in a natural or human-made disaster situation in which amateur radio operators are needed to assist first responders or other emergency officials. The intent of having the paper maps was to ensure that team members could travel to an incident scene if the power grid or internet were down and no GPS was available.

The idea blossomed into the acknowledgment that all of Fairfield County's emergency responders may also need paper maps when they travel in or out of the county or when providing mutual aid to other departments. So, the Map Packs project was created.

County engineer offices in the area were contacted and all generously donated a large quantity of paper maps for the Map Packs project.

"Once all of the maps were acquired, ATARA members assembled the Map Packs. The maps (6 county maps, 1 state map, and an atlas provided by one of the counties) were compiled into sets and placed in 9 × 12.5-inch water-resistant mesh zipper pouches paid for by donations from club members," said Milenovic.

Feedback has been very positive. Fairfield County Sheriff Alex Lape said, "These Map Packs contain folded paper maps of Fairfield County and all adjacent counties. These maps are very helpful in the event modern technology should fail. ATARA provided enough maps for all patrol vehicles and detectives."

Milenovic recommended that amateur radio clubs and operators may want to consider replicating this Map Packs project for their communities. Some RACES or EmComm units might consider doing the same. For more information, contact ATARA at president@atara-w8atr.fun. ✸

# FCC: Update FRN Contact Info Within 10 Days

ARRL The National Association for Amateur Radio® reports that the Federal Communications Commission (FCC) adopted changes to its rules to require that every holder of an FCC Registration Number (FRN) update their contact information in the CORES system (email and postal addresses) within ten business days of a change.

Because every FCC licensee—including amateur radio operators—must have an FRN to file applications, this requirement applies to all licensed amateurs. FRN contact information is handled separately and apart from contact information related to a license in the License Manager System. Both records must be kept up-to-date, and each requires a separate update.

Until now, no specific deadline existed for updating FRN or license contact information. Instead, the amateur rules at sections 97.21 and 97.23 provide that a license may be suspended or revoked "if FCC correspondence is returned as undeliverable because of an incorrect address/email." These provisions remain in effect as well as the 10-day deadline applicable to FRN information.

If your FRN information is current and has not changed, no immediate action is required, but you must adhere to the 10-day rule for future changes. It is recommended to periodically check both the CORES and License Manager System to ensure contact information is accurate, even if no changes have occurred.

The new deadline (section 1.8002(b)(2) of the Commission's Rules) became effective on February 5, 2026, as part of a proceeding that was limited to further constraining robocalls. Although the proceeding focused on robocall issues, the 10-day update requirement applies broadly to all FRN holders. On February 6 the FCC confirmed in a Public Notice that the new deadline applies to all FRN holders. The amendment replaces language adopted in 2001 that required FRN holders to keep their contact information up-to-date but had not imposed a deadline for doing so.

Numerous requests for clarification from non-robocaller interests led the FCC to issue a Public Notice on February 6 (see also PDF) clarifying that fines imposed on those subject to the robocall rules for not keeping contact information up-to-date do NOT apply to licensees such as radio amateurs, but that the 10-day deadline does apply to all FRN holders.

See the following resources for updating FRN and license information.

- FCC Tutorial on updating FRN information: https://apps.fcc.gov/cores/html/Update_FRN_Information.htm
- ARRL information on how to update license information: https://www.arrl.org/call-sign-renewals-or-changes

For assistance, call the FCC FRN Help Desk: (877) 480-3201 (available 8 a.m. to 6 p.m. ET). ✸

# NCVEC QPC Removes Three Questions

The National Conference of Volunteer Examiner Coordinators (NCVEC) Question Pool Committee (QPC) has removed two questions from the General Class question pool and one question from the Extra Class pool from use.

Due to recently published FCC rule changes affecting the 60-meter band (see previous ARRL News story), General Class questions G1A04 and G1C09 are no longer valid and must be removed from use on examinations. Extra Class question E4D05 must also be removed because it contains more than one correct answer. All affected questions should be removed from examinations as soon as possible.

Updated General Class question pool files, including the errata and new information, have been posted to the NCVEC General Class question pool web page at www.ncvec.org/index.php/2023-2027-general-question-pool-release. The current Element 3 General question pool became effective on July 1, 2023, and it is valid through June 30, 2027.

Updated question pool files have also been posted to the NCVEC Extra Class question pool web page at www.ncvec.org/index.php/2024-2028-extra-class-question-pool-release. The current Element 4 Extra question pool became effective on July 1, 2024, and it is valid through June 30, 2028.

The ARRL VEC advises the amateur radio community, and particularly Volunteer Examiners (VEs), to regularly check the NCVEC website at www.ncvec.org for updates to the question pools, which may include errata and withdrawn questions. ✸

# Next OCRACES Meeting: March 5th on Zoom

The next County of Orange RACES meeting will be on Thursday, March 5, 2026, at 7:00 p.m., on Zoom. This will be a members-only meeting, to discuss training and open positions for taking on responsibilities to improve our capabilities to serve the OCSD Emergency Management Division, the Mutual Aid Bureau, and the Department.

As noted last month, our monthly meetings are now on first-Thursdays, and the meeting time is now at 7:00 p.m., whether online or in-person. The March 5th Zoom meeting will be hosted by Joe Selikov, KB6EID. Members should check their emails for the meeting ID and passcode, and be sure to register on InTime.

Some future meetings will include a guest speaker and topics of interest for not only OCRACES members but also for members of all RACES and EmComm units and other interested radio amateurs.

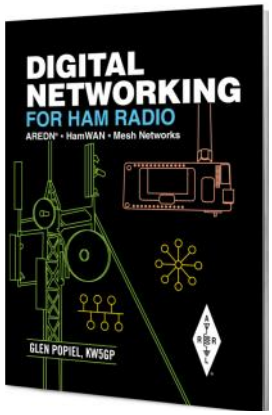
OCRACES weekly ACS nets remain on Mondays at 7:00 p.m.

# New Book: *Digital Networking for Ham Radio*

ARRL The National Association for Amateur Radio®'s new book, *Digital Networking for Ham Radio*, a practical, hands-on guide to designing and implementing high-speed data networks for amateur radio stations, is now shipping.

Written by Glen Popiel, KW5GP, the book brings together in one comprehensive resource the knowledge needed to build, configure, and expand digital networks for ham radio. From TCP/IP fundamentals to deploying mesh technologies such as AREDN®, HamWAN, and Meshtastic®, readers will find clear explanations and step-by-step guidance.

"When I began experimenting with amateur radio data networking, I realized there wasn't a single resource that clearly explained how it all works—especially TCP/IP in terms the average ham could relate to," said Popiel. "That inspired me to create a practical guide to designing and implementing high-speed amateur radio networks. Since there's no speed limit above 70 centimeters, operators can integrate webcams, IP phones, and other networked devices. I hope this book encourages hams to explore, experiment, and enjoy networking on the microwave bands."




*Digital Networking for Ham Radio* covers selecting hardware, choosing network topologies, configuring systems, and staying compliant with FCC Part 97 rules. The book is designed for both newcomers and experienced operators who want to expand their stations with resilient, high-speed networking capabilities.

*Digital Networking for Ham Radio* is now shipping. Order from the ARRL online store or through an ARRL publication dealer. ARRL Item No. 2349, ISBN: 978-1-62595-234-9, $29.95 ARRL member price, $34.95 retail.

For additional questions or ordering, call 1-888-277-5289 toll-free in the U.S., Monday through Thursday, 8 a.m. to 7 p.m. and Friday 8 a.m. to 5 p.m. Eastern Time.

# Handheld Scope Has 100-MHz Bandwidth

**YEAPOOK ADS5012h portable scope.**

An interesting instrument for servicing amateur radio equipment is the YEAPOOK ADS5012h handheld digital portable storage oscilloscope with 100-MHz bandwidth, offered on Amazon for $69.99. Maximum real-time sampling rate is 500 mega-samples per second (MSa/s). Maximum sample memory depth (record depth) is 128 kiloBytes (kB). This oscilloscope can measure v-p-p, v-p, v-max, v-min, v-avg, v-rms, frequency, cycle, dut+, dut-, tim+, and tim-. Horizontal sensitivity is 50 seconds per division down to 6 ns/div. Vertical sensitivity: 50 mV/div to 100 V/div. Analog input impedance: 1 megohm. Maximum input voltage: 80 V (1× probe) or 800 V (10×) probe. Coupling: DC or AC. Trigger modes: auto, normal, and single. Trigger types: rising/falling edge. Scan mode: support. Built-in 64 MB flash storage holds up to 2000 waveform images. Waveform manager supports browsing, viewing, flipping, and deleting waveform thumbnails, which is convenient for reading and analyzing waveform parameters.. Afterglow is adjustable from 1 to 8 seconds. Display: 2.4 inch color TFT-LCD with 320 × 240 resolution. Power supply: 3000 mAh lithium battery. Dimensions: 4.5 × 2.9 × 1.4 inch. Weight: 0.5 pound.

# 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 and near Orange County, as well as from Cal OES and federal agencies.**

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

**kbourne.ocsd@earthlink.net**

## OCRACES Website

The "Forms" page, which was removed during the reconfiguration of the OCRACES website, is now back online (https://ocraces.org/forms.html). Some of the useful forms on this page include an activation checklist and announcement, earthquake net procedures and a Modified Mercalli Intensity Scale, several different ICS forms, incident debrief forms, and Monday and Saturday ACS net scripts and roll calls.

Check the "OC EmComm" page (https://ocraces.org/county-city-races.html), which provides information for all RACES and affiliated EmComm units in Orange County (such as RACES or unit Coordinators, officers, meetings, websites, open repeaters, etc.). Please review the information for your unit and send corrections and updates to Ken Bourne, W6HK, at kbourne.ocsd@earthlink.net.

## Fountain Valley RACES

Martin Arroyo, KN6FFD, is the newly elected Chief Radio Officer for Fountain Valley RACES. The Assistant Radio Officer is Garry Jones, N6NQN.

## OCRACES Newsletter via Groups.io

Most readers of this newsletter receive it and other RACES announcements via their Groups.io account. If you need to change your account e-mail address, owners of the ocsd-races.Groups.io list are unable to do that for you. You can do that easily by going to https://groups.io/settings. You will, of course, need to log in with your Groups.io password, which you can also change on that website. The list owners are not able to add a member to the list without first sending an invitation to that prospective member, who would then reply to that invitation (no text is needed in that reply).

If you are receiving this newsletter but don't have a Groups.io account, it's because you are on the personal email address book of the list owner, Ken Bourne, W6HK, who "bcc"-sends this newsletter to those he previously invited to join the ocsd-races.groups.io list. To be removed from his "bcc" invited list and not receive this newsletter and OCRACES announcements, email Ken at kbourne.ocsd@earthlink.net. Eventually, his "invited" list will be discontinued, so, to continue receiving this newsletter, subscribe to the list by sending a request to main+subscribe@ocsd-races.groups.io. To unsubscribe, email main+unsubscribe@ocsd-races.groups.io. If Ken doesn't recognize your email address when you request to be subscribed, he will send you a request for your name, call sign, and affiliation, to qualify you.

## Orange County Amateur Radio Club (OCARC)

The next meeting of the Orange County Amateur Radio Club (OCARC) will be on Friday, March 20, 2026, at 7:00 p.m., at the American Red Cross (George M. Chitty Building), 600 Parkcenter Drive, Santa Ana).

## South Orange Amateur Radio Association (SOARA)

The monthly SOARA member meeting will be held on Monday, March 16, 2026, at 6:30 p.m. at the Norman P. Murray Community and Senior Center, 24932 Veterans Way, Mission Viejo. Visitors are welcome.

## Clairemont Repeater Association (CLARA)

The Clairemont Repeater Association (CLARA) will hold its bimonthly breakfast meeting on Saturday, March 21, 2026, at 9:00 a.m., at Denny's restaurant, 1571 El Camino Real, in Tustin. The meeting is held in the meeting room in the back corner of the restaurant. If you plan to order breakfast, please arrive around 8:00 a.m.

## San Bernardino Microwave Society (SBMS)

The next meeting of the San Bernardino Microwave Society will be on Thursday, March 5, 2026, at 7:00 p.m. PDT, at the American Legion Hall, 1024 S. Main Street, in Corona. To watch the SBMS meeting live, go to the American Television Network Live on YouTube and click on the "Live Now" window.

# March 2026

| Sun | Mon | Tue | Wed | Thu | Fri | Sat |
|---|---|---|---|---|---|---|
| 1 | 2 Weekly 2 m ACS Net | 3 | 4 | 5 OCRACES Meeting | 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 & SOARA Meeting | 17 | 18 | 19 | 20 Orange County Amateur Radio Club Meeting | 21 Weekly 60 m ACS Net |
| 22 | 23 Weekly 2 m ACS Net | 24 | 25 | 26 | 27 | 28 Weekly 60 m ACS Net |
| 29 | 30 Weekly 2 m ACS Net | 31 | | | | |

## Upcoming Events:

- **March 5, 1900-2100 hours:** OC-RACES meeting, online on Zoom
- **March 5, 1900 hours:** San Bernardino Microwave Society Meeting, American Legion Hall, 1024 S. Main Street, in Corona
- **March 16, 1830 hours:** South Orange Amateur Radio Association (SOARA) meeting, Norman P. Murray Community and Senior Center, 24932 Veterans Way, Mission Viejo
- **March 20, 1900 hours:** Orange County Amateur Radio Club (OCARC) meeting, American Red Cross (George M. Chitty Building), 600 Parkcenter Drive, Santa Ana
- **March 21, 0900 hours:** Clairemont Repeater Association breakfast meeting at Denny's, 1571 El Camino Real, in Tustin. (Arrive at 8:00 a.m. to order breakfast.)

## Mission Statement

■ **To provide emergency communication services for the County of Orange under the guidance of the Orange County Emergency Manager and Emergency Management Division Personnel**

■ **These services include, but are not limited to:**

- **Support to the County of Orange Emergency Management Division with auxiliary communications capabilities from County Emergency Operations Center radio room and field locations to and from:**
  - **The general population,**
  - **Orange County city RACES, EmComm, and Public Service organizations,**
  - **Adjacent counties, and**
  - **State and Federal Government organizations**
- **Provide voice and digital communication services in the event of the loss of existing communications infrastructure including public service radio services, cellphone service, internet service, conventional power, and any combination of these 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 (down for repair)
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) (down)
*Primary Net—Thursdays, 1900 hours

OCSD RACES Coordinator
Lee Kaser, KK6VIV, (714) 628-7081

Chief Radio Officer
Scott Byington, KC6MMF

Assistant Chief Radio Officer
Joe Selikov, KB6EID

Assistant Radio Officer
Randy Benicky, N6PRL

Chief Radio Officer Emeritus
Ken Bourne, W6HK

**County of Orange RACES**

**Orange County Sheriff's Department, Emergency Management Division**
**2644 Santiago Canyon Road, Silverado, CA 92676-9791**
**Telephone: (714) 628-7081 • Fax: (714) 628-7154**
**Email: LKaser@OCSheriff.gov**

# County of Orange RACES

*OCSD Emergency Management Division*
*2644 Santiago Canyon Road*
*Silverado, CA 92676*

Telephone: (714) 628-7081
Fax: (714) 628-7154
E-mail: LKaser@OCSheriff.gov

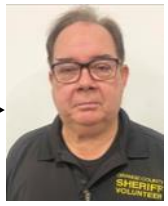
**Visit Our Web Site**
**https://ocraces.org**
**It's Where It's @!**

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*** →



Scotty Byington
KC6MMF

Joe Selikov
KB6EID

Randy Benicky
N6PRL

***OCSD RACES Coordinator*** →

Lee Kaser
KK6VIV

Heide Aguire
K3TOG

Joel Bishop
AJ6ZP

Ken Bourne
W6HK

Eric Bowen
W6RTR

Bill Ehart
KM6ZHO

Bill Griffin
KO6JHY

David Janisch
KN6HEE

Ted Lavino
KG6LZP

Scott MacGillivray
KM6RTE

Ron Mosher
K0PGE

Fran Needham
KJ6UJS

Chi Nguyen
KE6MVS

Dick Palm
KN6RVU

Lance Rzepiejewski
KO6CXL

Robert Stoffel
KD6DAQ

Chuck Streitz
KK6HFS

Luis Torres
KC6THP

Ken Tucker
WF6F