November 2024

Newsletter of the County of Orange Radio Amateur Civil Emergency Service

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OCRACES Meeting

Monday, November 4th, at 7:30 p.m., on Zoom

Orange County Sheriff's Department
Emergency Management Division

CRO's Nest

by Ken Bourne, W6HK, OCRACES Chief Radio Officer

Parallel Transmission Lines

Coaxial cable is not necessarily the best way to feed an antenna, especially if it's an HF wire antenna. Coax works okay with a resonant half-wave antenna, but if you try to use that antenna on other bands, it is no longer resonant and SWR becomes a problem. Parallel, open-wire transmission lines allow the use of non-resonant antennas on multiple bands, with an antenna tuner, and with lower loss than coax.

A multiband antenna will radiate efficiently on any band, as long as it is at least a half-wavelength long at its lowest frequency, even if it is not resonant, provided that it is fed properly, such as with an open-wire (parallel) transmission line and an antenna tuner.

The three most common parallel transmission lines used by radio amateurs are 300-ohm twin-lead, true ladder-line, and window-line (now mostly called ladder-line). My first antennas back in 1956 were Amphenol folded dipoles, consisting of regular 300-ohm twin-lead for the element and heavy-duty 300-ohm twin-lead for the transmission line. Regular 300-ohm twin-lead was common back then for feeding TV antennas. I used a Heathkit 4:1 balun to reduce antenna impedance to 75 ohms.

Before window-line became popular, hams constructed their own true ladder-lines (open-wire lines). It consisted of two wires, usually either clad in a DC-insulator or coated with a durable lacquer, held apart by insulated spacers between a constant 2 to 5 inches, depending on the wire and the desired impedance. The rungs are spaced about every 5 to 12 inches. The ratio of chosen wire spacing to wire diameter determines the line's characteristic impedance, usually 500 to 600 ohms, but depends on the wire insulation's relative permittivity and conductive loss in the rung insulators.

True ladder-line feeding a packaged dipole.

Window-line (commonly called ladder-line).

300-ohm twin-lead.

Transmission efficiency is maximum when the impedance of the antenna, the characteristic impedance of the parallel transmission line, and the impedance of the transceiver are the same. For this reason, a balun with an appropriate ratio is commonly used. It transforms the transmission line's impedance to match the impedance

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CRO's Nest *Continued from page 1*

of the 50-ohm coaxial cable connecting to the other end of the balun, and it transforms the balanced, symmetric transmission line to the nominally unbalanced coax input.

A parallel transmission line, such as ladder-line, window-line, or twin-lead, is not lossy like coax at high SWR. Also, its characteristic impedance is closer to the antenna's impedance range, which is lower at odd half-wavelengths and higher at even half-wavelengths. A balun (such as 4:1) is commonly used to transfer the balanced higher impedance line to an unbalanced lower impedance line such as 50-ohm coax, which then runs to an antenna tuner in the ham shack to match the transceiver's 50-ohm impedance. In other cases, a remote tuner is used at the antenna's feed point. Contrary to popular opinion, antenna tuners are not very lossy, unless the output (antenna side) impedance is less than 50 ohms. However, baluns can be lossy and require a change in ladder-line length. For example, I added about 3 feet to the ladder-line length to my G5RV antenna and reduced the balun loss.

A G5RV or dipole fed in the middle is a balanced antenna. The RF current in each conductor of ladder-line feeding it is equal and opposite. The ladder-line then does not radiate because of the resulting phase cancellation and, therefore, does not provide a vertical polarization component to the antenna system. However, off-center-fed antennas such as Windoms and end-fed arrays require chokes and baluns that can heat up and waste power if fed with ladder-line.

With a parallel transmission line, a high-quality choke or balun should be used at or near the antenna tuner, to reduce common-mode current and resulting RF feedback. Avoid using a length of ladder-line that would be multiple of a half-wavelength on any band of operation. Try to run the ladder-line perpendicular to the antenna to avoid picking up the antenna's magnetic field.

Some opinions recommend using odd eighth-wave multiples of the antenna's fundamental (lowest) frequency. The formula for length is 123 ÷ MHz × VF, ×1, ×3, ×5, ×7, etc. VF is the velocity factor which is about 0.91 to 0.92 for window-line. Such lengths supposedly will place impedance extremes between bands and more moderate impedances within bands for easier matching. Odd eighth-wave multiples will transform both low and high impedance to a range needed by the antenna tuner.

The manual for the MFJ-976 Balanced Line Tuner gives the following suggestions, which are useful for easily matching an antenna and ladder-line with a tuner:

- Never center feed a half-wave multi-band antenna with a high impedance feed line that is close to an odd multiple of a quarter-wave long.
- Never center feed a full-wave antenna with any feed line close to a multiple of a half-wave long.
- If this tuner will not "tune" a multi-band antenna, add or subtract an eighth wave of feed line (for the band that won't tune) and try again.
- Never try to load a G5RV or center fed dipole on a band below the half-wave design frequency. If you want to operate an 80-meter antenna on 160 meters, feed either or both conductors as a long-wire against the station ground.
- To avoid problems matching or feeding any dipole antenna with high impedance open wire lines, keep the lines around these lengths. [The worst possible line lengths are shown in brackets]:
  - 160 meter dipole: 35-60, 170-195 or 210-235 feet [Avoid 130, 260 ft]
  - 80 meter dipole: 34-40, 90-102 or 160-172 feet [Avoid 66, 135, 190 ft]
  - 40 meter dipole: 42-52, 73-83, 112-123 or 145-155 feet [Avoid 32, 64, 96, 128 ft]

  Some slight trimming or adding of feed line may be necessary to accommodate the higher bands.

WA1FFL Ladder-Loc strain relief and mounting support for 450-ohm ladder-line.

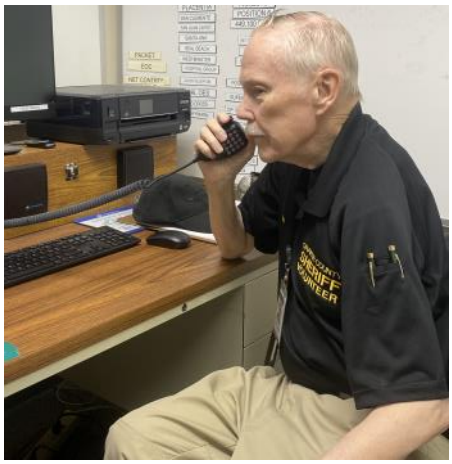
To increase ladder-line ruggedness, use 14-gauge stranded ladder-line, rather than 18-gauge solid line. Twist it about one twist every two feet to prevent it from oscillating in the wind. I use a WA1FFL Ladder-Loc strain-relief and mounting support for my 450-ohm ladder-line and 102-foot G5RV. ✸

OCRACES Meeting: November 4th on Zoom

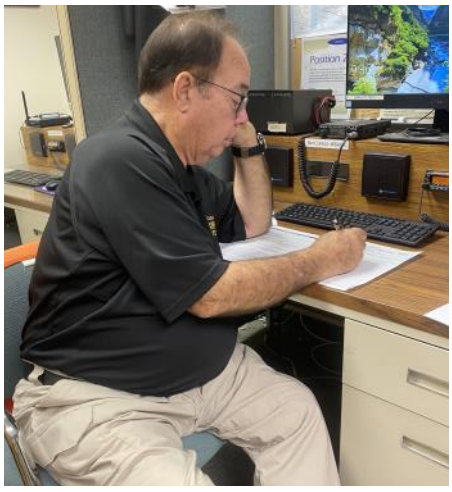
The next OCRACES meeting will be on Monday, November 4, 2024, at 7:30 p.m. on Zoom. The meeting will be hosted by Joe Selikov, KB6EID. ✸

October 5th ACS Drill Shakes Orange County

Simulating a powerful earthquake in Orange County that knocked out all RACES repeaters, the City/County RACES & EmComm ACS Drill on October 5, 2024, assumed extensive damage, looting, and injuries. A countywide emergency was supposedly declared, requiring auxiliary communications to be provided to county and city law-enforcement agencies. According to the scenario, street and highway traffic flow was disrupted, and bridges had collapsed. Power, water, and telephone infrastructures were disrupted, and heavy damage had occurred to hospitals, banks, and schools. In addition, all repeaters had failed, and all communications therefore were on simplex frequencies. All OCRACES communications were on 146.595 MHz simples, 5371.5 kHz upper sideband on 60 meters, and Winlink. During the first half hour, City RACES and EmComm units conducted roll calls on their primary simplex frequencies, and then, at 0930, began giving reports to OCRACES on 146.595 MHz simplex.



Chief Radio Officer Ken Bourne, W6HK, communicates at Loma Ridge during the October 5th ACS drill.



Radio Officer Scott Byington, KC6MMF, monitors 2-meter simplex operations during the October 5th drill.

OCRACES net control was run from the Orange County EOC RACES Room at Loma Ridge. Chief Radio Officer Ken Bourne, W6HK, scheduled the participation. Radio Officer Scott Byington, KC6MMF, assisted with instructing operations at the various positions. OCRACES Applicant Dick Palm, KN6RVU, handled simplex net control on 146.595 MHz, with PSR Bill Griffin as scribe for incoming traffic. Joel Bishop, AJ6ZP, was net control on 60 meters. Scott MacGillivray, KM6RTE, conducted Winlink operations.

OCRACES participants in the field on 146.595 MHz simplex included: Assistant Radio Officer Randy Benicky, N6PRL; Ted Lavino, KG6LZP; Chi Nguyen, KE6MVS; Robert Stoffel, KD6DAQ; and Ken Tucker, WF6F.

City RACES units participating on 146.595 MHz simplex included Anaheim, Brea, Costa Mesa, Dana Point, Fountain Valley, Irvine, Laguna Niguel, Laguna Woods, Los Alamitos, Mission Viejo, Orange, Placentia, San Clemente, San Juan Capistrano, and Seal Beach. EmComm units included American Red Cross, Newport Beach Repeater Club, OCHEART, and U.S. Coast Guard Auxiliary.

Check-ins on 5371.5 kHz (60 meters) upper sideband included: Ken Tucker, WF6F (OCRACES); Greg Gerovac, K6GYO (Anaheim RACES); WA6FV (Fountain Valley EOC); Pete Bergstrom, K6PB (Irvine RACES); Bruce Bonbright, NH7WG, and Phil Kowal, AJ6VT (Laguna Woods RACES); Dale Tyler, W6EDT (Mission Viejo RACES); Don Poysa, K0VNJ (Orange RACES); Rich Erickson, KU6H, and Gary Frantz, KE6IXK (Seal Beach/Los Alamitos RACES); Bill Kreutinger, KM6SLF (Tri-Cities RACES); Paul Gussow, NJ6U (Cal OES CRU); and Gary Standard, K6GSX (Newport Beach Repeater Club). Non-EmComm check-ins included: Art Ewers, KW6AE (San Clemente); Bob Musser, KB6KPK (Orange); Harlan

OCRACES applicant Dick Palm, KN6RVU (left) operates net control on 146.595 MHz simplex while PSR Bill Griffin serves as scribe for incoming traffic.

Joel Bishop, AJ6ZP, handles check-ins and traffic on 60 meters during the October 5th ACS drill.

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October 5th ACS Drill *Continued from page 3*

Parameter	Value	Details / Comments
Total number of messages received and sent during the 24-hour exercise *- Most every message received was sent a reply or acknowledgement*	83 (32% decrease from May 2023 drill)	Compares to: - May 2024: 122 - May 2023: 75 Oct 2023: 70 - May 2022: 91 Oct 2022: 51 - Oct 2021: 82
Messages received from unique Winlink accounts *- Many operators sent multiple messages from same Winlink account*	32 (9% decrease from May 2023 drill)	Compares to: - May 2024: 35 - May 2023: 30 Oct 2023: 26 - May 2022: 31 Oct 2022: 25 - Oct 2021: 31
Types & Numbers of Attached Forms	- Check-In (33) - Other or No Form Attached (3)	- Good results from using simple Check-In form
Approx Data Handled by Gateway KM6RTE-10	- 25 Messages to CMS - 48 Messages from CMS - 123,550 Bytes to CMS - 265,874 Bytes from CMS - 13 Operators Connected	This is probably lower data traffic than what would be expected during a real emergency
Utilized "Standard" City Callsigns	- CAORARC: American Red Cross - CAORMVJ: Mission Viejo	- *Way to Go!!*

Summary of Winlink results during the October 5th City/County RACES & EmComm ACS Drill, as noted by Scott MacGillivray, KM6RTE.

Rogers, K6BS (Orange); and Tony Scalpi, N2VAJ (Orange).

Several scenario messages were transmitted from the field during the drill. For example, OCRACES Assistant Radio Officer Randy Benicky, N6PRL, reported shots fired in Lake Forest; suspect is armed and barricaded. Robert Stoffel, KD6DAQ, reported an aftershock in northwest Fullerton; a two-story motel collapsed at Malvern and Gilbert; first responders are needed at a shopping center at Bastanchury west of Brea Boulevard. Brea RACES reported flooding at a water reservoir; water engineering equipment is needed. Costa Mesa said no resources were needed. Tri-Cities RACES (at Dana Point) reported a collapsed overpass; hills erosion at Pacific Coast Highway; equipment needed. Fountain Valley RACES reported their EOC was on emergency power; traffic jam at I-405 and Magnolia; injuries; help needed from OCHEART. Laguna Niguel ACS said a building had collapsed; rescue needed; water needed. Laguna Woods RACES requested fuel. American Red Cross reported major damage in Placentia. Newport Beach Repeater Club said the harbor is closed due to a tidal wave; fissures in the road. OCHEART reported hospitals have lost power.

Scott MacGillivray, KM6RTE, emphasized that the drill gave Winlink operators the opportunity to gain experience and demonstrate operation of their stations by transmitting a message with an attached form. The drill assessed the level of Winlink usage across the county and identified current Winlink operators: KA6TCR, CAORARC, K6WDA, KF6BRC, W6SOI, WA6RUZ, KE6SWE, CAORMVJ; KN6NXJ; KJ6OKV; W6EIF; AI6ZN; KM6ZPO; KA6ANA; KM6OQY; KE6MVS; KG6LZP; KW6REX; KN6FFD; KK6OEX; KM6SLF; WF6F; K6FUL; N6IPD; K6PB; W6EDT; KC6BWK; KN6VFB; KG6IMB; NG6H; and KN6BMO.

Scott noted that, overall, there was a good turnout on Winlink. It was slightly less than the May drill, but it was the most ever for an October drill. This time, a simple Winlink check-in form was used. The drill was successful, even though the KM6RTE -12 gateway at Loma Ridge was offline. The KM6RTE-10 gateway at Panorama Heights was offline briefly at the beginning of the drill, but was quickly restored. ✸

Scott MacGillivray, KM6RTE, at the Winlink position at the EOC RACES Room during the October 5th drill.

OCRACES Conducts Oct. 17th ShakeOut Drill

Orange County RACES conducted a drill simulating a powerful earthquake in conjunction with the Great California ShakeOut on Thursday, October 17, 2024, from 1000 to 1100 hours, on the 146.895 MHz repeater. Net control operated from the County EOC RACES Room at Loma Ridge. At Loma Ridge were Chief Radio Officer Ken Bourne, W6HK, and Radio Officer Scott Byington, KC6MMF. Applicant Lance Rzepiejewski, KO6CXL, efficiently ran the net, with excellent assistance from PSR Bill Griffin, serving as scribe for check-ins and incoming messages. Scott MacGillivray, KM6RTE, took Winlink check-ins as he operated from the field.

Simulated earthquake intensity observations were reported using the Modified Mercalli Intensity Scale. OCRACES members checking in from the field included Assistant Radio Officer Randy Benicky, N6PRL, Joel Bishop, AJ6ZP, Steve Livingston, NJ6R, Scott MacGillivray, KM6RTE, Chi Nguyen, KE6MVS, and Robert Stoffel, KD6DAQ. OCRACES applicant Dick Palm, KN6RVU, also checked in.

City RACES units were also active in the ShakeOut Drill, including two members from Fountain Valley RACES, eight from Laguna Woods RACES, three from Seal Beach/Los Alamitos RACES, two from Tri-Cities RACES, one from Costa Mesa RACES (MESAC), two from Orange RACES (COAR), one from Mission Viejo RACES, and one from Placentia RACES. A member from American Red Cross also checked in.

Besides Mercalli ("Mike-Mike") reports, typical scenario messages included cars rocking, windows damaged, moderate damage to structures, solar panel loose, power outage, power lines down, multiple roofs collapsed, and fires. ✸

Radio Officer Scott Byington, KC6MMF (background), observes OCRACES Applicant Lance Rzepiejewski, KO6CXL, running the ShakeOut net on the 146.895 MHz repeater while PSR Bill Griffin (foreground) serves as scribe for incoming messages.

Handbook 101: New Generation of Ham Radio

ARRL® The National Association for Amateur Radio® has announced the next generation of *The ARRL Handbook*.

The ARRL Handbook is a complete guide to wireless technology, experimentation, practice, and development Its more than 1,200 pages delve into radio electronics, circuit design, digital modulation techniques, and equipment construction.

The 101st edition's new editor, Greg Lapin, Ph.D., N9GL. and his team have revised entire chapters on radio fundamentals, transmission lines, general safety, assembling a station, etc. Major updates include:

- Information on electromagnetic analysis and inexpensive tools for modeling circuits, antennas, and propagation.
- New material on higher-level modeling of transmitters and receivers.
- A new section on preparing your station for emergency operations.
- Radio astronomy receiver and antenna design information.
- A new section on batteries and battery safety.
- A new section on NEC4 and the antenna modeling software built on it.
- New material on SWR meters and related tests.
- The latest on RF safety and compliance with FCC exposure regulations.

Handbook 101 comes with an e-Book download, including the fully searchable digital edition of the printed book, plus expanded supplemental content, software, PC board templates, and other support files.

The ARRL Handbook is available in a six-volume set and softcover book for $69.65 from the ARRL Store or ARRL dealer (such as HRO).

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

Seal Beach/Los Alamitos RACES

Incoming Seal Beach RACES Chief Radio Officer John Breiding, KG6IMB, submitted excellent reports of the Seal Beach/Los Alamitos RACES participation in the City/ County RACES & EmComm ACS Drill on October 5, 2024, and the Great ShakeOut Drill on October 17th.

During the October 5th drill, after reconfiguring laptop settings, they were able to send a Winlink message. They checked in to Loma Ridge on VHF with their station at the Seal Beach Police Department, and on 60 meters from stations to the north. They used their mesh phones and left a message on Mesh Chat. Participants included: Rich Erickson, KU6H; Jerry Grandt, KD6JPD; Mike Goldberg, KC6BWK; Gary Frantz, KE6IXK; Bob Spence, KF6KVR (incoming Seal Beach Assistant Radio Officer); Michael Peer, WD6CDN (Los Alamitos Chief Radio Officer); and John Breiding, KG6IMB (incoming Seal Beach Chief Radio Officer).

They had 18 participants during the October 17th drill. They called into OCRACES on the 146.895 MHz repeater and used their UHF repeater for full coverage throughout Los Alamitos and Seal Beach. They also used the AREDN mesh phone with five members and mesh cameras at two locations.

Orange County Sheriff's Department

Former Orange County Sheriff Brad Gates passed away on Friday, October 25, 2024, at the age of 85. He served six terms in office, from 1975 to 1999, which were defined as "24 Years of Progress." He took the helm of this agency at the age of 35 after only 14 years into his law-enforcement career. Although it has now been over 24 years since Sheriff Gates retired, much of what the Department has in place today are a result of initiatives he began.

He constructed the Intake Release Center (IRC), expanded the Theo Lacy Facility, guided the Countywide Coordinated Communications System (CCCS), established the Regional Narcotics Suppression Program (RNSP), instituted new technologies at the Crime Lab, expanded the use of civilian job classifications, founded the Sheriff's Advisory Council (SAC) and Drug Use is Life Abuse, and led the way as the first large law-enforcement agency to have video cameras installed in patrol units.

Sheriff Gates had an affinity for the West. He enjoyed riding horses, was often spotted in a cowboy hat, and even won his first election as Sheriff with an endorsement by western actor John Wayne. In Old West times, a peace officer was commonly referred to as a "lawman." Lawmen like Wyatt Earp are credited with bringing order to the chaos of the Wild West and making the frontier a safe place to live and raise a family. Our current Sheriff Don Barnes said, "The West was tamed long before Brad Gates became Sheriff, but like the lawmen before him, he ensured a rapidly growing county was kept safe."

Sheriff Barnes continued, "Brad Gates epitomized the best of a lawman, he led with integrity, possessed tremendous strength, and stood tall in defense of the public he was sworn to serve. History books will record Brad Gates as Orange County's 10th Sheriff, but he will always rank as top lawman in the hearts of those he so ably led."

Sheriff Gates is survived by his wife Deedee, son Scott, daughter Deedee Jo, her husband Eddie, grandchildren Joanna, Emma, and Nathan, big brothers Stillman and Robert, and little sister Margaret Lapham.

Orange County Sheriff's Museum & Education Center

The Orange County Sheriff's Museum & Education Center will hold its 20th Anniversary Fundraising Gala on Saturday, November 23, 2024, from 5:30 p.m. until 10:00 p.m. at AOCDS (Association of Orange County Deputy Sheriffs), 1600 N. Main Street, in Santa Ana.. Parking and entrance are off of N. Sycamore Street behind (west of) the AOCDS building. The gala will include a guest speaker, dinner, and silent auction. Tickets are $100. Business casual. Please pay in advance to PayPal or OCSM&EC, 22365 El Toro Road #174, Lake Forest, CA 92630.

November 2024

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

Upcoming Events:

- **November 4, 1930-2130 hours:** OCRACES Meeting, online
- **November 6, 1830 hours:** Orientation for Professional Services Responder (PSR) applicants, Orange County Sheriff's Regional Training Academy, 15991 Armstrong Ave., Tustin
- **November 15, 1900 hours:** Orange County Amateur Radio Club Meeting, American Red Cross (George M. Chitty Building), 600 Parkcenter Drive, Santa Ana. Ken Miller, K6CTW, will talk on American and International Morse code and their history.
- **November 23, 1730-2200 hours:** Orange County Sheriff's Museum & Education Center 20th Anniversary Fundraising Gala, AOCDS, 1600 N. Main Street, Santa Ana
- **November 28:** Happy Thanksgiving!

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
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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https://ocraces.org
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Questions or Comments?
Contact *NetControl* Editor Ken Bourne, W6HK
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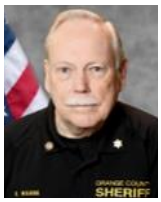
"W6ACS ... Serving Orange County"

Meet Your County of Orange RACES Members!

Officers



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NJ6R

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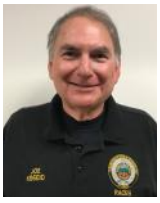
KM6RTE

Robert Moore
KW6B

Ron Mosher
K0PGE

Fran Needham
KJ6UJS

Chi Nguyen
KE6MVS



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