

October 2019



Newsletter of the County of Orange Radio Amateur Civil Emergency Service

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## Captain's Corner

*by RACES Captain Ken Bourne, W6HK, Chief Radio Officer*

### Delete Symbol-Rate Limits?

As a radio amateur for 63 years, I have always treasured the opportunities as a ham to experiment with new radio-electronics technologies, especially where such experimentation could result in improved (or new) emergency communications capabilities. Unfortunately, some experimentation is unduly restricted by obsolete or ill-defined FCC rules. One of those rules defines symbol-rate limits for data transmissions. Considering pros and cons, I think that such limits should be eliminated and replaced by bandwidth limits instead. The following comments are from an ARRL September 18th news release.

On September 17, 2019, ARRL renewed its request that the FCC delete symbol-rate limits for data transmissions in the Amateur Service rules. As it did in its initial filing, ARRL asked the FCC to couple the removal of the symbol rate limits with the adoption of a 2.8 kHz bandwidth limit. In response to a 2013 ARRL Petition for Rulemaking (RM-11708), the FCC proposed deleting the symbol-rate limits but declined to replace them with the 2.8 kHz bandwidth that ARRL wanted.

"This proceeding addresses an update to the Commission's rules that is needed because a limitation in the rules unintentionally is inhibiting US amateurs from employing the latest improvements to some of the digital modes," ARRL said in its remarks. "Data signals commonly used for daily communications as well as in disaster situations have bandwidths in the range of 2.5 kHz and must co-exist with other modes that use bandwidths as narrow as 50 Hz."

ARRL said the 1980s-era symbol-rate limits now inhibit the use of some efficient

data modes. "The symbol rate limit uniquely prevents radio amateurs in the United States from experimenting and innovating with a class of modern digital communication techniques that already are widely used in other countries," ARRL told the FCC. "The limit also impairs the ability of amateurs to improve support that they offer in times of disaster."

Repealing the symbol-rate limit would "allow shortened transmission times for the same amount of data without increasing the bandwidth occupied by the signal," ARRL contended. "Other amateurs would benefit by the resulting reduction in potential interference."

One issue of concern expressed by some radio amateurs involves automatically controlled digital stations (ACDS). Concerns focused on interference that could occur with a move away from symbol-rate criteria. ACDS with signals wider than 500 Hz and below 29.7 MHz are confined to specific subbands. ARRL recommended that the FCC consider rule changes that would have all ACDS stations and digital stations with bandwidths greater than 500 Hz share identified subbands.

ARRL said if additional signals are added to the ACDS subbands, as recommended, that it would strongly support expanding the HF ACDS subbands.

Refuting encryption claims, ARRL noted that FCC rules permit the use of "new and innovative digital modes" without prior approval, if specified conditions are met. Digital techniques must use approved codes with publicly documented technical characteristics, and their purpose must be to facilitate communications and not to obscure content.

### Next OCRACES Meeting

Monday,  
October 7, 2019,  
at 1930 Hours

840 N. Eckhoff Street,  
Suite 104,  
Orange

NBEMS by  
Bob Morris, KK6BXJ,  
and David Bell, K6DJB



Orange County Sheriff's Department  
Communications & Technology Division

## Letters to the Editor

*This correspondence from Joe Moell, KØOV, adds interesting information to the CONELRAD article that appeared in September 2019 NetControl.—Editor.*

Hi Ken,

Interesting article in *NetControl* about CONELRAD. I didn't realize there were so many different CONELRAD receivers and monitors. I had the ubiquitous Heath CA-1 hooked to an old All-American-Five radio in my station.

I think you may have confused CONELRAD with the fear of missile attacks. CONELRAD predated the missile era and was actually intended to confuse the pilots of enemy bombers who might try to use AM broadcasters as navigation aids. If all the stations were on 640 kHz or 1240 kHz, how would the pilots know where they were?

*(Joe is correct. The establishment of CONELRAD in 1951 was before the Soviet Union claimed in 1957 to have an ICBM. My reference to the preparation for a possible nuclear attack should have emphasized how CONELRAD was originally intended to confuse enemy pilots trying to use AM broadcast stations as navigation aids. When radio amateurs began complying with CONELRAD in 1957, it was right around the time when both the Soviet Union and the U.S. were beginning to test ICBM capabilities (not very successfully at first). As I recall, I was more concerned in the late 1950s about enemy pilots homing in on my signal than guided missiles doing that, so I agree with Joe's statement. CONELRAD was replaced with the Emergency Broadcast System (EBS) in August 1963, when ICBMs had become more of a concern than enemy bombers.—Editor.)*

The system was only tested once, on July 20, 1956, and no detailed report of the success of that test was made public.

Quickly moving the frequency of an AM station isn't easy. The tuning units for typical AM stations are designed to match 50-ohm transmitters to the antenna impedance (rarely close to 50 ohms) over a very narrow bandwidth. Each station had to figure out how to change the L's and C's in those tuning units. It wasn't as simple as retuning the pi network in your old AM ham rig. It was even more difficult for directional stations with more than one tower. Those stations typically went to one-tower non-directional operation for CONELRAD.

For instance, our local radio station's engineer had to figure out how to move from 1450 kHz to 1240 kHz, not an easy move for a station on a tower that was already less than a quarter-wavelength high.

The solution for our local station was to use a separate flat-top antenna and tuning unit just for CONELRAD. This antenna had been approved for temporary use on 1450 kHz earlier while the station was building a new tower, then the tuning unit was modified for 1240 kHz to be ready for CONELRAD. As a result, it was one of the first stations back on the air during the test.

Moving frequency of a vintage transmitter wasn't trivial either. The station had to have a 640-kHz or 1240-kHz crystal at the ready, and these crystals usually required ovens. Then each stage had to be tuned, oscillator to final. Fortunately, many of those adjustments had vernier dials that could be marked in advance of the correct adjustments to save time when the QSY had to take place.

The switching between stations on 640/1240 kHz was supposed to be controlled via special leased phone lines, which would also carry Presidential messages.

When I worked at two radio stations while in college, there wasn't CONELRAD any more but we still had EBS. It was activated via the news teletype at the AM station but the FM station didn't have teletype so we monitored the primary EBS station in Omaha. Both stations had an envelope that was to be opened only in case of a real activation. It had a list of code words that were compared to the message on the teletype to authenticate that it was an actual emergency. Then we were to read a special script in the envelope and go off the air.

73,

Joe

*We also received correspondence from Ray Grimes, N8RG, who is a big fan of Cold War items and in particular CONELRAD.—Editor.*

Hi Ken,

I really enjoyed your CONELRAD article. The Motorola Ratelco is interesting, as it's basically a Motorola model 57A AC/DC table radio that RATELCO fabricated (formerly the premier Motorola MSS in Seattle that made the famous RA-TELCO 12-V high-current bench power supplies). The 57A has a small sub-chassis that appears to be a Motorola SP production item, based on the construction, components, and quality. The sub-chassis monitors AGC voltage and the lack of signal at 640 kHz or 1240 kHz causes a relay to drop out, lighting a light and blowing white noise from lack of a station.

73,

Ray

## Next OCRACES Meeting: Monday, Oct. 7th

The next County of Orange RACES meeting will be on Monday, October 7, 2019, at 7:30 PM, at OCSD Communications & Technology Division, 840 N. Eckhoff Street, Suite 104, in Orange. At this meeting, Bob Morris, KK6BXJ, and David Bell, K6DJB, will give a presentation on NBEMS (Narrow Band Emergency Messaging Software), which is an open-source software suite that allows radio amateurs to reliably send and receive data using nearly any computer (Windows, Mac, and Linux) and any analog radio without requiring a dedicated digital infrastructure or specialized modem hardware. NBEMS works on VHF/UHF FM and on HF. NBEMS uses the FLDIGI suite of software routines that emulate the hardware modem, compute the error correction, and format many standard message forms (including ICS forms).

Bob and David are associated with the Northwest Riverside ARES group and the American Red Cross Riverside Chapter. They conducted the ARES boot camp at the Orange County Red Cross in January 2019. The ARES boot camp chapter on NBEMS will be the source of their presentation.

Thanks to Jeff Mikoleit, KK6YUP, of City of Orange RACES (COAR), for arranging this presentation.

## Deployment Drill: October 5, 2019

The next City/County RACES & MOU Drill will be on Saturday, October 5, 2019, from 0900 to 1100 hours. This will be a deployment drill, similar to last year's drill, which proved to be very enjoyable. Unit members will set up portable stations on 60 meters as well as on OCRACES repeaters on 2 meters and 70 centimeters, especially in areas that are questionable for accessing the repeaters, such as deep in canyons or below seaside cliffs. Depending on the number of participants, some possible locations for portable stations include Irvine Park east of Orange (although having easy access to repeaters, this is the area where OCFA stages during wildfire incidents), eastern end of Carbon Canyon Road, eastern end of Silverado Canyon Road, eastern end of William Canyon Road, Modjeska Canyon Road near Tucker Wildlife Sanctuary, Rose Canyon north of Trabuco Canyon Road, Thomas F. Riley Wilderness Park, Ronald W. Caspers Wilderness Park, Dana Cove Park in Dana Point, Divers Cove in Laguna Beach, etc. (When those poor-coverage areas are located, alternate coverage via 60 meters channel 4 NVIS (near vertical incidence skywave) on 5371.5 kHz upper sideband (dial frequency) will be tested. Simplex relay will also be tested on 2 meters (146.595 MHz) and 70 centimeters (446.000 MHz), with relay stations at high points, such as Belmont Park in the Orange hills, Canyon Rim Park in Anaheim Hills, northeastern end of Hidden Hills Road in Yorba Linda, Coastal Peak Park (near Signal Peak) in Newport Beach, Top of the World or Alta Laguna Park in Laguna Beach, etc.

City and County RACES members are encouraged to set up portable 60-meter stations and experiment with various horizontal antennas such as MFJ Hamstick dipoles mounted on tripod masts. Portable and mobile stations should beacon via APRS, using a cell-phone app such as aprs.fi or a 2-meter tracker.

## Matt Luczko, KM6CAO, Silent Key

We are extremely sad to report that our dear friend and valued OCRACES member Matt Luczko, KM6CAO, passed away on Monday, September 16, 2019, at 79 years old. Matt became an OCRACES member in October 2016, while serving as an OCSD Professional Services Responder (PSR) since March 20, 2012. He was a member of the OCSD Search & Rescue Reserve Unit and was certified as a Terrorism Liaison Officer (TLO) and Cyber Liaison Officer (CLO) by the Orange County Intelligence Assessment Center (OCIAAC). He was also a member of the OCSD High-Tech Services Reserve Squad, Investigative Reserve Unit. Matt had taken several OCIAAC and OCSD training classes and was very dedicated to the Orange County Sheriff's Department and to Orange County RACES. Matt had a good attendance record at OCRACES meetings and participated in several drills and events.

Matt was born in Utica, New York, and moved to California in March 1982. He worked for Hughes Aircraft until its closure in 1995, as Facilities Director and head of major construction. He then joined the ranks of the private sector, directing his skills toward major construction projects for Disney Adventure Park, Hoover Dam, Chapman University, and Whittier College, as well as Los Angeles and Orange County school bond projects, etc. After retiring in 2008, he started his own Construction Management Contracting firm.



**Matt Luczko, KM6CAO.**



## City/County RACES & MOU Meeting: Oct. 21st

The next City/County RACES & MOU meeting will be on Monday, October 21, 2019, at 7:30 PM, at OCS D Communications & Technology Division, 840 N. Eckhoff Street, Suite 104, in Orange. At this meeting we will review the October 5th City/County RACES & MOU ACS Exercise. We will also plan possible countywide participation in the Great ShakeOut drill on October 17th (see article below). Also at this meeting Laguna Niguel ACS Deputy Radio Officer David Gorin, KB6BXD, will give a presentation on the Orange County Hospital Emergency Amateur Radio Team (OCHEART), which is a successor to the Hospital Disaster Support Communications System (HDSCS), originally established to support the Mission Hospitals in South Orange County, but now expanding to cover more of the county, operating mostly under an official RACES activation.

## Psychological First Aid for DSWs: October 9th

The Orange County Health Care Agency Behavioral Health Services Disaster Response, in conjunction with the Orange County Sheriff's Department Emergency Management Division, will present "Psychological First Aid for Disaster Service Workers" training on Wednesday, October 9, 2019, from 6:00 PM to 8:00 PM, at Irvine City Hall, 1 Civic Center Plaza, in Irvine. The presenter is Rachael Ferraiolo, LCSW, SC I. The class is intended for volunteers with an affiliated Citizen Corps program, including CERT, RACES, Medical Reserve Corps, Volunteers in Police Service, Fire Watch, Red Cross, or partner program.

In this training, attendees will learn about Psychological First Aid (PFA), an evidenced-informed modular approach that can help individuals in the immediate aftermath of a disaster or critical incident. This interactive training will include general information on PFA such as the basic objectives and tips for working with specialty populations as well as cover the 8 Core Actions that will enable responders to deliver PFA to those in need. This interactive training also provides attendees with sample scripts and the opportunity to rehearse the 8 Core Actions. Course objectives include:

- Have a basic understanding of Psychological First Aid
- Understand and perform the 8 Core Actions of Psychological First Aid
- Learn cultural considerations for delivering Psychological First Aid

2.5 Continuing Education Credits have been approved for psychologists, Licensed Clinical Social Workers (LCSWs), Licensed Marriage and Family Therapists (LMFTs), Licensed Professional Clinical Counselors (LPCCs), and Registered Nurses (RNs).

To register for this class, contact Michelle Baldwin at [mbaldwin@ocsd.org](mailto:mbaldwin@ocsd.org).

## Great ShakeOut: Thursday, October 17th

In support of the Orange County Sheriff's Department Emergency Management Division (EMD), County of Orange RACES will activate at the EOC on Loma Ridge for the Great California ShakeOut on Thursday, October 17, 2019, from approximately 10:00 AM to 11:00 AM. The EOC RACES Room will take calls on the 146.895 MHz repeater from OC-RACES members as well as from members of City RACES and MOU units. OCRACES will also listen for requests from City RACES units to check into nets on City RACES frequencies during the ShakeOut.

The Great California ShakeOut is an annual opportunity to practice how to be safer during big earthquakes: "Drop, Cover, and Hold On." OCRACES members at the EOC should be prepared to follow any instructions given by EMD (perhaps over the EOC's PA system), especially at 10:17 AM on October 17th, when the simulated earthquake is supposed to hit. EMD might announce the beginning of the drill with a scenario of strong shaking that could last one minute. (If no EMD announcements are made, the OCRACES Chief Radio Officer might make the announcement for those in the RACES Room, and perhaps over the air (with "This is a drill" added to any over-the-air announcement). Everyone would be told to "Drop, cover, and hold on." While down on the floor, participants should look around at what would be falling on them in a real earthquake. Those items should be secured or moved after the drill. After at least one minute, whether or not announced by EMD on the PA system, the OCRACES Chief Radio Officer (or designee) will announce that the simulated shaking is over and for everyone to stand up again. If this announcement is made over the air, "This is a drill" should be added to the announcement, as before.

The drill scenario might require evacuation of the EOC RACES Room or perhaps even of the entire EOC, unless it is determined that this would not be a safe action due to hazards from fallen or broken objects.

## KC6TWS and K6PB Hide in Orange

Peter Gonzalez, KC6TWS, and Pete Bergstrom, K6PB, were the fox on the monthly cooperative T-hunt on Monday, September 16, 2019. They hid in the back parking lot of OCSD Communications & Technology Division, near the Santa Ana River in Orange.

First to find the fox were Ken Bourne, W6HK, and Don Mikami, N6ELD. They took initial bearings from the Orange County Mining Company in the eastern part of Orange. Their bearings were almost straight west and just a tad to the north. Also hunting was Ron Allerdice, WA6CYY, who had an initial bearing to the west and slightly north from Tustin Street and Chapman Avenue. Ken had a hunch that the fox might be near OCSD/Communications on Eckhoff Street, and they drove immediately to that area and found the fox.

We will probably not have a hunt in October, due to a third-Monday conflict with the City/County RACES & MOU meeting. The next hunt will be on Monday, November 18, 2019, immediately following the OCRACES 2-meter net (approximately 7:20 PM). The fox will hide on paved, publicly accessible property in a city or sector of Orange County to be announced a few days before the hunt. He will transmit tones on the input (146.295 MHz) of the 146.895 MHz repeater. Hunters will compare bearings via the 448.320 MHz repeater and are encouraged to beacon their positions via APRS while hunting. We are looking for a volunteer to be the fox.

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



At the fox's den are (left to right) Don Mikami, N6ELD, Ron Allerdice, WA6CYY, Peter Gonzalez, KC6TWS, and Pete Bergstrom, K6PB.

## New: Icom IC-705 HF/50/144/150 MHz Radio

On the horizon (sometime in 2020, after FCC approval) is the new Icom IC-705 HF/50/144/430 MHz all-mode 10-watt SDR transceiver that is small enough to fit in one hand, yet is claimed to have "base-station performance." Dimensions are only 7.9 (W) × 3.1 (H) × 3.3 (D) inches. Weight is 2.25 pounds (excluding battery and antenna). Modes include D-STAR DV, SSB, CW, AM, and FM. It receives continuously from the medium-wave broadcast band to the 144-MHz band, including FM broadcast and aeronautical band.

The IC-705 uses RF direct sampling. A high-speed, high-resolution, real-time spectrum scope and waterfall display are incorporated on a 4.3-inch touch-screen color display. It comes with the BP-272 Li-ion battery pack. Transmit output power while using the BP-272 is 5 watts. When connected via its supplied DC power cable to a 13.8 Vdc external power source, output power is 10 watts.

D-STAR functions include DR and terminal mode/access-point mode. It allows sending and receiving and viewing saved photos without any application software. A GPS antenna is built-in. In the D-STAR DV mode, you can send and receive location information while communicating. GPS enables various functions such as GPS log and repeater search. The IC-705's microSD card slot can be used for firmware upgrades, programming, etc., as well as voice recording and saving GPS log data.

An internal antenna tuning unit is not included. Bluetooth and wireless LAN are built-in, which can be used for smartphone linking and remote control, and also for Bluetooth headsets.

A VHF/UHF whip antenna and HM-243 speaker-microphone come standard. The HM-243 is equipped with programmable buttons assignable to various functions such as frequency adjustment and volume control.

The IC-705 operates in the optional dedicated LC-192 multi-function backpack, which has holes for the antenna and holes for passing through coaxial cables and microphone cables.



Icom IC-705 HF/50/144/430 MHz all-mode 10-watt transceiver.

# RACES/MOU News from Around the County

**"RACES/MOU News" provides an opportunity to share information from all City & County RACES/ACS units and MOU organizations and supportive amateur radio clubs in Orange County.**

**Please send your news to NetControl Editor Ken Bourne, W6HK, at: kbourne.ocsd@earthlink.net**

## Costa Mesa RACES (MESAC)

MESAC Chief Radio Officer Patrick Williams, KJ6PFW, reports that the MESAC board feels that they would like to have EOC-to-EOC drills again to familiarize everyone with contacting adjacent cities and the County. *(Perhaps three drills per year would be desirable—Deployment Drill, ACS Radio Rodeo, and EOC-to-EOC—Editor.)*

MESAC has been asked to provide a presence at the annual Costa Mesa Fire and Rescue EXPO/Open House with live fire fighting and rescue demonstrations. MESAC also received a request from Huntington Beach RACES to provide communications support for the Great Pacific Airshow on October 4th, 5th, and 6th. Therefore, MESAC will not be available to participate in the October 5th City/County RACES & MOU Drill.

## Huntington Beach RACES

Huntington Beach RACES will provide communications support for the Great Pacific Airshow on October 4th, 5th, and 6th. Therefore, HBRACES will not be available to participate in the October 5th City/County RACES & MOU Drill. They will be running three "Air Nets" on three different repeaters, plus using an OCRACES 70-cm repeater as backup. Two HBRACES members will be at two different airports (John Wayne and Los Alamitos Joint Training Center) from 10:00 AM to 5:00 PM all three days of the Air Show.

## Newport Beach RACES

Jim Robertson, KK6NK, is now the Chief Radio Officer of Newport Beach RACES.

## Orange County Hospital Emergency Amateur Radio Team (OCHEART)

Laguna Niguel ACS Deputy Radio Officer David Gorin, KB6BXD, has been putting considerable effort into establishing the South Orange Hospital Emergency Amateur Radio Team (SOHEART). The concept appears to be expanding to cover more of Orange County, with a name change to OCHEART. The following is David's previous description of SOHEART.

**The South Orange Hospital Emergency Amateur Radio Team (SOHEART) is an exploratory committee composed of members of Mission Viejo RACES and Laguna Niguel Auxiliary Communications Service formed out of concern that no emergency communications support currently exists for critical medical facilities in South Orange**

**County.**

**The mission of SOHEART is to research hospital emergency communications protocols and resources in order to provide RACES Radio Officers with information useful to hospital responders in their ranks.**

**The protocols currently under consideration are for backup communications:**

- Point-to-point within the hospital
- Hospital to hospital
- Hospital to County Emergency Operations Center
- Hospital to County Healthcare/EMS

**Of primary consideration are worst case communications scenarios when landline or cellular telephone systems, the Internet, the power grid, or repeaters may be compromised or unavailable.**

**Licensed amateurs interested in participating must:**

- Be willing to adhere to the unique requirements and responsibilities of hospital emergency communications
- Be registered Disaster Service Workers affiliated with a unit of the Radio Amateur Civil Emergency service and participate only with approval of their Chief Radio Officer *(Official activations in affiliation with RACES must be declared by the agency's RACES program coordinator—Editor.)*

**SOHEART will conduct a regular net Wednesdays from 1900 to 1945 hours for discussion and training related to hospital emergency communications.**

David says his thinking has evolved from copying the ARES model followed by HDSCS. He now envisions the mission of SOHEART/OCHEART as a non-deployable association dedicated to improving hospital response by RACES Emergency Communicators through education, peer contacts, and the sharing of technical information.

David says this is more consistent with the concept of integration with RACES. "HDSCS philosophy should guide hospital responders in their specialized roles, but deployment should be according to orthodox RACES command structure and protocols."

David says SOHEART will now go by OCHEART. He plans to make a presentation about OCHEART at the next City/County RACES & MOU meeting on October 21, 2019.



# October 2019

Sun	Mon	Tue	Wed	Thu	Fri	Sat
		1	2	3	4	5 City/County RACES & MOU ACS Exercise
6	7 Weekly 2 m ACS Net & OCRACES Meeting	8	9	10	11	12 Cal OES Southern Region ACS Meeting
13	14 Weekly 2 m ACS Net	15	16	17 Great California ShakeOut	18	19 Weekly 60 m ACS Net
20	21 Weekly 2 m ACS Net & City/County Meeting	22	23	24	25	26 Weekly 60 m ACS Net
27	28 ACS Net on Five Bands & Cal OES Nets	29	30	31		

## Upcoming Events:

- **October 5:** City/County RACES & MOU Drill, 0900-1100 hours
- **October 7:** OCRACES Meeting, 1930-2130 hours, OCSD Communications & Technology Division, 840 N. Eckhoff Street, Suite 104, Orange
- **October 12:** Cal OES Southern Region ACS Leadership Meeting, 1000-1200 hours, Los Angeles County Sheriff's Communications Center
- **October 14:** Columbus Day (OCRACES ACS net in operation)
- **October 17:** Great California ShakeOut, 1000-1100 hours (simulated earthquake at 1017 hours)
- **October 21:** City/County RACES & MOU Meeting, 1930-2130 hours, OCSD Communications & Technology Division, 840 N. Eckhoff Street, Suite 104, Orange (no co-operative T-hunt)



[www.ocraces.org](http://www.ocraces.org)



## Mission Statement

County of Orange RACES has made a commitment to provide all Public Safety departments in Orange County with the most efficient response possible to supplement emergency/disaster and routine Public Safety communications events and activities. We will provide the highest level of service using Amateur and Public Safety radio resources coupled with technology, teamwork, safety, and excellence. We will do so in an efficient, professional, and courteous manner, accepting accountability for all actions. We dedicate ourselves to working in partnership with the Public Safety community to professionally excel in the ability to provide emergency communications resources and services.

## County of Orange RACES Frequencies

- 60 m: 5371.5 kHz USB (dial) (Channel 4) (OC ACS Net—Saturdays, 1000 hours)
  - 40 m: 7250 kHz LSB
  - 10 m: 29.640 MHz output, 29.540 MHz input, 107.2 Hz PL
  - 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)
  - 23 cm: 1287.650 MHz, 1287.675 MHz, 1287.700 MHz, 1287.725 MHz, 1287.750 MHz, and 1287.775 MHz outputs, -12 MHz inputs, 88.5 Hz PL
- \*Primary Net—Mondays, 1900 hours

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Scott Byington, KC6MMF

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714-997-0073

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Ernest Fierheller, KG6LXT  
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Tom Tracey, KC6FIC

## County of Orange RACES

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Questions or Comments?  
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[kbourne.ocsd@earthlink.net](mailto:kbourne.ocsd@earthlink.net)



**“W6ACS ...  
Serving  
Orange County”**

## Meet Your County of Orange RACES Members!

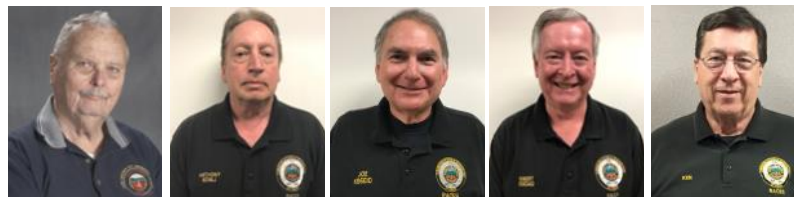
**Officers** →



Ken Bourne W6HK    Scott Byington KC6MMF    Jack Barth AB6VC    Ernest Fierheller KG6LXT    Bob McFadden KK6CUS    Tom Tracey KC6FIC



Randy Benicky N6PRL    Ray Grimes N8RG    Walter Kroy KC6HAM    Martin La Rocque N6NTH    Don Mikami N6ELD



Harvey Packard KM6BV    Tony Scalpi N2VAJ    Joe Selikov KB6EID    Robert Stoffel KD6DAQ    Ken Tucker WF6F



Tom Wright KJ6SPE



Lee Kaser KK6VIV