



Newsletter of the County of Orange Radio Amateur Civil Emergency Service

Inside this issue:

Captain's Corner	1
InfraGard	2
OCRACES Meeting	3
ACS Radio Rodeo	3
New Ham Licenses	4
60-Meter ACS Net	4
Cooperative T-Hunt	5
Field Day	5
RACES/MOU News	6
Events Calendar	7
OCRACES Members	8

Captain's Corner

by RACES Captain Ken Bourne, W6HK, Chief Radio Officer

Bidirectional Amplifiers

What are bidirectional amplifiers (BDAs), and where are they used? You often hear RF engineers and technicians referring to BDAs when discussing public-safety two-way radio systems they are working on, but BDAs are not common in amateur radio systems—or are they?

A BDA is a signal booster that is used to cover “dead spots” such as inside buildings or other areas where signals do not penetrate, such as tunnels, parking garages, stairwells, etc. BDAs are common in cellular or public-safety two-way radio systems, mostly at UHF and microwave frequencies. They receive signals from an outside source and retransmit the signals into the dead areas, and also receive, amplify, and retransmit signals from inside dead areas to the outside—all at the same time in both directions.

BDAs are amplifiers/repeaters with specified gain and power. They can be part of a distributed antenna system (DAS), which is a network of separate antenna nodes connected to a common transport medium.

BDAs for public-safety two-way radio systems are different than those for cellular systems. BDAs are also used to extend the range of Wi-Fi systems. Models typically are available with power ratings from 100 milliwatts to 25 watts, for use in the 300-500 MHz, 700 MHz, 900 MHz, 1.3 GHz, 2.4 GHz, 3.5 GHz, 4.0-5.0 GHz, and 5.8 GHz bands. Some radio amateurs have incorporated BDAs in 900 MHz systems as well as Broadband-Hamnet (formerly

called HSMM-Mesh) and AREDN (Amateur Radio Emergency Data Network) mesh systems.

The FCC allows Part 90 licensees (such as public-safety) to use BDAs without additional licensing, under certain conditions. Class A BDAs are “channelized” or channel-selective narrowband signal boosters. Class B BDAs are broadband or band-selective, and all signals within the passband of the signal booster are amplified. The passband width is typically many kilohertz or megahertz.

A digitally programmed BDA uses digital filtering. If the bandwidths are programmed to only pass one licensee’s channels, it is a Class A signal booster by FCC definition. If the bandwidths are programmed to pass not only the licensee’s channels but also non-licensee’s channels, it is an FCC Class B signal booster.

BDAs can be a source of interference. Several instances of interference from cellular BDAs in the 824-849 and 869-894 MHz bands have been reported. The FCC is quite particular about their use, stating that “licensees may install in-building radiation systems without applying for authorization or notifying the FCC, provided that the locations of the in-building radiation systems are within the protected service area of the licensee’s authorized transmitter on the same channel or channel block.” A licensee’s authority to install a BDA does not permit a subscriber to install a BDA, unless that subscriber has receive explicit authorization from the licensee to do so.

Continued on page 2

Next OCRACES Meeting:

**Monday,
May 7, 2018,
at 1930 Hours**

**840 N. Eckhoff
Street, Suite 104,
Orange**

**David Corsiglia,
WA6TWF, on
FlexRadio FLEX-6600**



Captain's Corner *Continued from page 1*

Some subscribers have installed poorly designed imported BDAs to boost their cellular coverage, only to be confronted with complaints from public-safety agencies experiencing interference from those “runaway” BDAs after the agencies (or the FCC) locates the offending devices by direction-finding techniques.

In some cases, BDAs in 700-MHz systems have caused receivers for the control channel in a trunked radio system to become desensitized so the channel is not activated to transmit radio calls.

As stated by Jack Daniel, KD6VYL (SK), who was a well-known expert on BDAs, most BDA feedback oscillation problems are caused by poor, unstable hardware designs and by improper installation. To avoid installation problems, outside-to-inside antenna isolation (loss) should be at least 15 dB more than the BDA's gain.

Channelized (Class A) systems often have higher gain than broadband (Class B) BDAs, resulting in outside-to-inside antenna isolation that is difficult to maintain. Because of higher output power per channel, the oscillation interference level can be much higher than from a lower power broadband BDA.

The FCC specifies -13 dB maximum on out-of-band emissions. Most BDAs are designed with automatic gain control to stay within this limitation, which is near the amplifiers' 1 dB compression point.

BDA output power will be at the maximum capacity of the amplifiers when oscillating. Oscillations may occur anywhere within the passband(s) and may vary in frequency over time, as observed by Jack Daniel. Out-of-band emissions (noise) will also increase because of the nonlinearity of the amplifiers during oscillation.

InfraGard Helps to Protect Infrastructure

RACES members are encouraged to consider joining InfraGard, a public-private partnership managed by the FBI with the purpose of sharing information concerning protection of our nation's critical infrastructure. Communications is one of those critical elements.

Applicants for InfraGard membership will undergo an FBI background investigation and, once cleared, will receive a membership document, regular e-mailed security briefings, access to the secure InfraGard Internet site, and invitations to a variety of training sessions.

The InfraGard vetted membership consists of thousands of subject-matter experts across 16 critical infrastructure sectors. Members include business executives, entrepreneurs, military and government officials, computer professionals, academia, and state and local law enforcement, dedicated to support the mission and protection of the nation's critical infrastructure and advancing national security.

Members gain an understanding of the threats posed by criminals and foreign adversaries, and receive information and tools consistent with the most current best practices.

InfraGard has 82 chapters with more than 46,000 members nationwide helping to protect and defend critical infrastructures. At the chapter level, members meet to discuss threats and other matters that impact their agencies and companies. The meetings—led by a local governing board and an FBI agent who serves as InfraGard coordinator—give everyone an opportunity to share experiences and best practices. The Los Angeles Chapter covers seven counties—Los Angeles, Orange, Riverside, San Bernardino, San Luis Obispo, Santa Barbara, and Ventura. Roger Rieger, President and CEO of InfraGard Los Angeles (IGLA), states on the IGLA Web site (<https://infragardlosangeles.org/>) that, over the past year, IGLA has accomplished each of its mandated training modules and several new advanced programs that address the changing threat matrix affecting the individual sectors and the many industries in them. Many IGLA members are involved in the National Members Alliance Special Interest Groups (SIG). IGLA has its own Cyber Intelligence Group (CIG).

Training is available from the FBI via the InfraGard program on a number of timely subjects. Some members are trained as a Terrorism Liaison Officer (TLO). The course trains students in the information sharing intelligence-gathering mission, which is crucial to the war on terrorism. The course explains the mission of the Joint Regional Intelligence Center (JRIC), the primary duties of a TLO, the proper handling of sensitive information, and the organization structure of the Intelligence Community. TLO training is available not only from JRIC but also from the Orange County Intelligence Assessment Center (OCIAC), but signing up requires an agency e-mail address (your call sign at ocraces.org doesn't count!).

Applications for InfraGard membership are accepted online only. For more information, go to <https://infragardlosangeles.org/infragard-membership.shtml>.

Next OCRACES Meeting: May 7th

The next OCRACES meeting will be on Monday, May 7, 2018, at 7:30 PM, at OCSD Communications & Technology Division, 840 N. Eckhoff Street, Suite 104, in Orange. David Corsiglia, WA6TWF, will give a presentation on his FlexRadio FLEX-6600 SDR transceiver. Also at this meeting we will review the recent May 5th ACS Radio Rodeo (see article below), with emphasis on what went well and what could be improved in planning future similar exercises. We will also discuss our Saturday morning net activities, including 40-meter and 60-meter propagation.

ACS Radio Rodeo: May 5, 2018

The California Governor's Office of Emergency Services (Cal OES), Southern Region, will host the 2018 ACS Radio Rodeo on Saturday, May 5, 2018. The primary purpose of the event is to conduct radio tests among RACES/ACS mobile communications vehicles within an Operational Area, and with adjoining participating Operational Areas to verify their inter-agency interoperability. OCRACES will participate in this event, instead of our usual first-Saturday-in-May Orange County ACS exercise. Formal message traffic will not be included in this exercise, and, therefore, we will not need to use ICS 213 message forms.

Each county in the exercise will have at least one central location where emergency communications vehicles will be gathered. Larger counties, such as Riverside and San Bernardino counties, will probably have two or more central locations. The Orange County central location will be in the back parking lot of OCSD Communications & Technology Division, 840 N. Eckhoff Street, in Orange.

Setup will officially begin at 0800 hours. All participants must sign in on the ICS 211 A Incident Personnel Check-in List. Mandatory participant briefing will be at 0830 hours. As shown in the on-site ICS 205 form, the first roll calls will be local, between vehicles and portable stations at the central location, and will occur between 0900 and 1000 hours. In Orange County, we will call the roll on seven different frequencies or repeaters, in the following order. The Saturday 40-meter roll call will be used on 7250 kHz. The Monday-night roll call will be used on the 2-meter and 70-centimeter frequencies (full roll call on 146.895 MHz), and an abbreviated form on the other bands.

1. 7250 kHz lower sideband (from NI6E van)
2. OCRACES 2-meter repeater on 146.895 MHz (-), 136.5 Hz PL (from OCSD Control Seven)
3. OCRACES 2-meter simplex on 146.595 MHz (from OCSD Control Seven)
4. OCRACES 70-centimeter repeater on 448.320 MHz (-), 141.3 Hz PL (from OCSD Control Seven)
5. OCRACES 70-centimeter simplex on 446.000 MHz (from OCSD Control Seven)
6. OCRACES 6-meter repeater on 52.62 MHz (-), 103.5 Hz PL (from NI6E van)
7. OCRACES 1¼-meter repeater on 223.76 MHz (-), 110.9 Hz PL (from NI6E van)

Cal OES will call the roll on 10 different repeaters and linked systems from their Southern Region EOC in Las Alamitos, in the following order as listed on the OA-to-OA ICS 205 form. The listed linked-system frequencies are accessed from our location. Other counties may use other frequencies for accessing the systems. We will check in from OCSD Control Seven and the NI6E van, as shown.

1. 7230 kHz lower sideband (from NI6E van)
2. Cactus linked system on 446.840 MHz (-), 100.0 Hz PL (from OCSD Control Seven)
3. SCRN linked system on 447.680 MHz (-), 118.8 Hz PL (from OCSD Control Seven)
4. EARN linked system on 224.76 MHz (-), 100.0 Hz PL (from NI6E van)
5. OCRACES 70-centimeter repeater on 448.320 MHz (-), 141.3 Hz PL (from OCSD Control Seven)
6. LACDCS 2-meter repeater on 145.300 MHz (-), 100.0 Hz PL (from OCSD Control Seven)
7. LACDCS 70-centimeter repeater on 445.800 MHz (-), 88.5 Hz PL (from OCSD Control Seven)
8. RIVCO RACES 70-centimeter repeater on 448.180 MHz (-), 131.8 Hz PL (from OCSD Control Seven)
9. RIVCO RACES 1¼-meter linked repeater on 224.820 MHz (-), 114.8 Hz PL (from NI6E van)
10. Condor 1¼-meter linked system on 224.820 MHz (-), 156.7 Hz PL (from NI6E van)

Newport Beach RACES Chief Radio Officer Peter Putnam, NI6E, will park his van next to the County Chevy Tahoe (Control Seven) to assist with the local roll calls on 40 meters, 6 meters, and 1¼ meters, and with checking in to the OA-to-OA nets on 40 meters and 1¼ meters.

Debriefing is at 1100-1115 hours. Vehicle and equipment exhibition and inspection is at 1115-1200 hours. Demobilization is at 1200 hours.

More than 30,000 New Ham Licenses in 2017

For the fourth year in a row, more than 30,000 new licensees joined the Amateur Radio ranks, and the ARRL Volunteer Examiner Coordinator (VEC) conducted more than 7,000 Amateur Radio exam sessions, serving some 35,350 candidates for a new or upgraded license. At the end of December 2017, the U.S. amateur radio population stood at 748,136. At nearly 378,000, Technician licensees represented the largest segment, with General (174,206), Amateur Extra (145,034), Advanced (41,938), and Novice (9,056) trailing. Licensee numbers showed continued growth across all classes except Advanced and Novice, which the FCC no longer issues; those numbers continue to drop.

“I’m hopeful that the number of new licensees will be more than 30,000 at the end of this year,” ARRL VEC Manager Maria Somma, AB1FM, said. “I would love to see this trend continue!” Somma said topping the 7,000 mark in ARRL VEC-sponsored exam sessions since 2014 was “an important milestone for us.” In 2017, the ARRL VEC administered 7,075 sessions.

Despite the optimistic influx of 32,196 newcomers last year, the net growth of 5,349—about 0.72% over December 2016—reflects some 27,000 expired or cancelled licenses in the FCC database over the past year. In making the case for changes to the entry-level license, the ARRL Board’s Entry-Level License Committee referred to “the large number of Baby Boomers (roughly born 1945–65) [who] will soon be aging off the licensee rolls.” The committee predicted the likelihood of “a significant decline in the number of hams, unless we take steps to reverse it.”

Somma said that, in addition to exam session administration, ARRL VEC also processed and electronically transmitted 8,765 address changes and license renewals to the FCC for ARRL members in 2017. “This free service to members continues to be a strong draw,” she said. She further pointed out that, as one of three FCC-authorized Club Station Call Sign Administrators (CSCSA), ARRL VEC processed and transmitted 1,761 club license applications for the FCC in 2017, of which 338 were for new club licenses.

The number of Amateur Radio license upgrades was 9,576 in 2017, continuing a slight downward trend over the past 10 years.

New Licenses (2008-2017):

- 2008: 28,066
- 2009: 30,144
- 2010: 27,528
- 2011: 24,072
- 2012: 27,082
- 2013: 28,886
- 2014: 33,241
- 2015: 32,077
- 2016: 32,552
- 2017: 32,196

Upgraded Licenses (2008-2017):

- 2008: 15,501
- 2009: 10,796
- 2010: 10,726
- 2011: 10,337
- 2012: 10,283
- 2013: 9,325
- 2014: 10,556
- 2015: 11,224
- 2016: 10,617
- 2017: 9,576

60 Meters Added to Saturday 40-Meter Nets

OCRACES continues to hold a 40-meter ACS net every Saturday morning at 10:00 AM (except during activations, drills, or meetings). The frequency is 7250 kHz lower sideband. Stations checking in give a signal report and a brief antenna description and polarity. Propagation conditions have been poor for in-county communications, and several stations have relied on a remote SDR receiver in Half Moon Bay, accessed via <http://69.27.184.62:8901/>. When David Corsiglia, WA6TWF, checks in, he often offers the use of his remote 440-MHz station on Pleasants Peak. Stations in Northern California sometimes provide a relay between southern and northern Orange County. A station in Ventura often checks in via relay in northern California. We recently started calling the roll on 60 meters after the 40-meter net and have found that in-county propagation is better than on 40 meters, but is worse to northern California. We also tried 80 meters, but that was not as good as 60 meters. Activity is low on 60 meters, since many of the 40-meter net participants do not have radios that transmit on 60 meters or antennas that tune to that band.

The FCC has established five channels on 60 meters. Phone operation is on upper sideband, and listed frequencies are dial frequencies (Channel 1 = 5330.5 kHz; Channel 2 = 5346.5 kHz; Channel 3 = 5357.0 kHz; Channel 4 = 5371.5 kHz; Channel 5 = 5403.5 kHz). Maximum power is 100 W PEP ERP referenced to a half-wave dipole. Bandwidth must not exceed 2.8 kHz. Amateur radio stations have secondary status on 60 meters, and must yield to primary users.

WF6F Hides in Orange

It was a cold and windy night, and Ken Tucker, WF6F, was the fox on the monthly cooperative T-hunt on Monday, April 16, 2108. He hid in the John's Place parking lot near Chapman Avenue and Jamboree Road in the eastern part of Orange. Ken turned on the fox box immediately following the 2-meter OCRACES ACS net. His fox box was built around an Arduino micro-controller.

After getting an east bearing from the 55 Freeway and Katella Avenue, Ron Allerdice, WA6CYY, was the first to find the fox. Next was the team of Peter Gonzalez, KC6TWS, and Pete Bergstrom,



At the fox's den are (left to right) Joe Moell, KØOV, Jack Barth, AB6VC, Roger Kepner, W6SQQ, Peter Gonzalez, KC6TWS, Pete Bergstrom, K6PB, Ken Tucker, WF6F (the fox), and Ron Allerdice, WA6CYY.

K6PB, driving almost directly to the fox from Irvine. Third place was taken by Jack Barth, AB6VC. Although they started fairly close (Orange County Mining Company parking lot), Ken Bourne, W6HK, and Roger Kepner, W6SQQ, did not get a bearing toward the fox because of a hill in the way. Instead, they drove up to Serrano Avenue in the hills to the north and then heard reports on the UHF repeater that a couple of hunters were narrowing in near Santiago Canyon College. As they came back down to Chapman and Newport Boulevard, the signal picked up. Fifth place was taken by Joe Moell, KØOV, who was also befuddled by the blocking hill.

The next hunt will be on Monday, May 21, 2018, 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. No fees will be required to drive directly to the fox. He will transmit 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 throughout the hunt. We are looking for a volunteer to be the fox.

The cooperative T-hunts are usually held on the third Monday of each month. The hunts provide excellent practice in working together to find sources of interference quickly. The hunts are not official RACES events, so DSW (Disaster Service Worker) coverage does not apply. Please drive carefully!

Fox-hunt loops and beams are available from Arrow Antenna and HRO, including the Arrow Model FHL-VHF fox-hunt loop (covers 1 MHz to 600 MHz) and the Arrow Model 146-3 three-element portable hand-held yagi. The Arrow OFHA 4-MHz offset attenuator can be useful when close to the fox, to prevent receiver overload. For on-foot hunting, the BC-146.565 three-element, hand-held, foldup, yagi antenna is available from Bob Miller Enterprises (<http://www.rdfantennas.com>), along with the VK3YNG MK4 sniffer. An all-mode transceiver is quite useful, allowing hunters to switch to the SSB or CW mode for detecting extremely weak signals, or to switch in a built-in attenuator, reduce RF gain, or tune slightly off frequency when dealing with extremely strong signals. Some hunters use the DF2020T radio direction finder kit, which is a Doppler system available from Global TSCM Group, Inc. (<http://www.kn2c.us>). A very similar system is the MFJ-5005 Doppler direction finder. Useful apps are available for iPhones and Android phones. For some excellent information on T-hunting, see <http://www.homingin.com>.

Field Day: June 23-24, 2018

OCRACES members are asked to support the Orange County Amateur Radio Club this year in operating and setting up at ARRL Field Day on June 23-24, 2018. OCARC will again hold its Field Day at the Walter Knott Education Center at 7300 La Palma Avenue in Buena Park. Contact Ron Mudry, W6WG, to offer your availability (day time or night time) and your band/mode preferences. Ron's e-mail address is ron@mudry.us, and his cell number is 714-328-9308. For more information, see the OCARC Web site at <http://w6ze.org/>.

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: w6hk@ocraces.org

Westminster RACES

On Saturday, March 24, 2018, Westminster RACES again participated in the City of Westminster's annual Spring Festival held in the north parking lot of the Civic Center. Setting up and manning a display/information booth were Assistant Radio Officer Adam Valek, N6HVC, along with Chu Nguyen, KE6YSS, Radio Officer Chi Nguyen, KE6MVS, and Barbara Eames, KJ6EBA. The team answered questions about the



Assistant Radio Officer Adam Valek, N6HVC, and Barbara Eames, KJ6EBA, man the Westminster RACES booth at the March 24th Spring Festival at the Civic Center.

work and purpose of Westminster RACES, distributed RACES and amateur radio operation literature, and fielded questions about testing and the importance of operators supporting the Police Department during emergencies, and the fun of connecting with other operators around the world. The four team members manning the booth recorded 21 volunteer hours speaking with the event visitors, elected officials, and City personnel.

Hospital Disaster Support Communications System (HDSCS)

HDSCS is planning for an upcoming "Radio Coach" session, which is when newer members, and any members with new equipment, come for information on repeater operation; the repeaters used by HDSCS; and making sure members are competent with their individual equipment. Leadership will be participating in a 4-hour tabletop drill along with hospital disaster coordinators and

EMS staff in preparation for the spring drill, which will involve a wildfire scenario. Planning is being finalized for an educational meeting on smoke and fire injuries also related to the upcoming spring drill.

More than 100 medical and emergency preparedness personnel attended the Orange County Spring Drill TableTop Exercise in April. The main focus was to identify best practices and lessons learned from real-world fire incidents. The Ventura County Health Care Coordinator was a guest presenter who shared responses and issues from the fire in Ventura County last fall. Other presenters included the Orange County Healthcare Preparedness Manager and a member of the Orange County Healthcare Behavioral Health Services Disaster Response. Each attendee was assigned to a table with others so as to encourage maximum interaction. HDSCS, normally assigned to a table with hospital representatives in these settings, was this time asked to participate at one of the two county tables. In addition to interface among six to eight participants at individual tables, facilitators around the room elicited comments and experiences from the various tables. The exercise provided opportunities for HDSCS to expand on its capabilities for linking medical facilities to various entities within, and out of, the county.

Orange County SKYWARN

Alex Tardy, SKYWARN Program—Warning Coordination Meteorologist, shares an updated full weather spotter training module for Southern California. In the past there was some confusion with the quiz and problems with running the training on Apple. This version is on YouTube at <https://youtu.be/NydrhHhOBXo> so everyone should be able to view. You can step through at your own pace and focus on sections as a refresher. The full training video is 1 hour 50 minutes. There are many photos of the weather and hazards that you can enjoy, as well as learn some meteorology while understanding NWS operations. New spotters would still have to sign up at the links provided toward the end of the training. If you took the prior online training, this new version has updated links and weather events.

May 2018

Sun	Mon	Tue	Wed	Thu	Fri	Sat
		1	2	3	4	5 ACS Radio Rodeo
6	7 Weekly 2 m ACS Net & OCRACES Meeting	8	9	10	11	12 Weekly HF ACS Net
13	14 Weekly 2 m ACS Net	15	16	17	18 Orange County Amateur Radio Club Meeting	19 Weekly HF ACS Net
20	21 Weekly 2 m ACS Net & Cooperative T-Hunt	22	23	24	25	26 Weekly HF ACS Net
27	28 Weekly 2 m ACS Net (Memorial Day)	29	30	31		

Upcoming Events:

- **May 5:** ACS Radio Rodeo, 840 N. Eckhoff Street, Orange 0800-1200 hours
- **May 7:** OCRACES Meeting, 840 N. Eckhoff Street, Suite 104, Orange, 1930-2130 hours
- **May 21:** Cooperative T-Hunt on input of 2-meter repeater, 1920 hours
- **May 18:** Orange County Amateur Radio Club Meeting, American Red Cross (George M Chitty Building), 600 Parkcenter Drive, Santa Ana, 1900 hours
- **May 28:** Memorial Day (ACS net on 2 meters only)
- **June 23-24:** Field Day
- **July 7:** HRO Ham Jam



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

40 m: 7250 kHz SSB (City/County/MOU Net—Saturdays, 1000 hours)
 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

RACES Program Coordinator (Emergency Comm's Manager)
 Lee Kaser, KK6VIV
 714-704-8080

Chief Radio Officer (Captain)
 Ken Bourne, W6HK
 714-997-0073

Radio Officer (Lieutenant)
 Scott Byington, KC6MMF

Assistant Radio Officers (Sergeants)
 Jack Barth, AB6VC
 Ernest Fierheller, KG6LXT
 Bob McFadden, KK6CUS
 Tom Tracey, KC6FIC

County of Orange RACES

OCSD/Communications & Technology
 840 N. Eckhoff St., Suite 104, Orange, CA 92868-1021
 Telephone: 714-704-8080 • Fax: 714-704-7902
 E-mail: lkaser@ocsd.org

County of Orange RACES

OCSD/Communications & Technology
840 N. Eckhoff St., Suite 104,
Orange, CA 92868-1021

Telephone – 714-704-8080
Fax – 714-704-7902
E-mail – ocraces@comm.ocgov.com

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

Questions or Comments?
Contact *NetControl* Editor Ken Bourne, W6HK
w6hk@ocraces.org



**“W6ACS ...
Serving
Orange County”**

Meet Your County of Orange RACES Members!



Ken Bourne
W6HK



Scott Byington
KC6MMF



Jack Barth
AB6VC



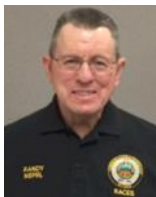
Ernest Fierheller
KG6LXT



Bob McFadden
KK6CUS



Tom Tracey
KC6FIC



Randy Benicky
N6PRL



Roger Berchtold
WB6HMW



David Corsiglia
WA6TWF



Ray Grimes
N8RG



Walter Kroy
KC6HAM



Martin La Rocque
N6NTH



Matt Luczko
KM6CAO



Fran Needham
KJ6UJS



Harvey Packard
KM6BV



Tom Riley
K6TPR



Brad Russo
KB6GPM



Tony Scalpi
N2VAJ



Joe Selikov
KB6EID



Robert Stoffel
KD6DAQ



Ken Tucker
WF6F



Tom Wright
KJ6SPE



Lee Kaser
KK6VIV