

April 2012



Newsletter of the County of Orange Radio Amateur Civil Emergency Service

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Captain's Corner

by RACES Capt. Ken Bourne, W6HK, Chief Radio Officer

More Electronic Kits Available

There is a resurgence in electronic kit building, reminiscent of the days of Heathkit and Knight Kit products, which were a great introduction to radio-electronics technology several decades ago. As I became a radio amateur in 1956 as a high-school student, I began building Heathkits and was thrilled seeing those connected parts come to life on the ham bands. It was sad to see Heathkit leave the amateur radio market many years ago, but now they promise to introduce some new ham radio products. Meanwhile, there is an increasing number of kit manufacturers, to keep the newcomers and well as us old timers busy on our test benches. My favorite is Elecraft, which offers the K3 HF transceiver in kit form (we have the factory-manufactured version in the EOC RACES Room), as well as the P3 panadapter and the KPA500 solid-state amplifier. However, Elecraft is a bit expensive for the average teen-ager getting into ham radio, but many other kits are available for newcomers on a limited budget, to acquaint them with the mysteries of radio-electronics. Some kits are directly related to amateur radio, while others cover other areas of electronics.



Heathkit DX-35 was an inexpensive and popular HF AM/CW transmitter kit, available from July 1956 to December 1957.

Kits Help Discover Inner Inventor

One of the new kit manufacturers is SparkFun Electronics in Boulder, Colorado, featured in an article posted on February 22nd by Lou Frenzel on the *Electronic Design* Web site. With more than 1800 products, its main focus is embedded microcontrollers and related items, but it also offers parts and kits for almost anything electronic. The company's goal is to help individuals discover their inner inventor and enable them to create their own electronic products.

**The Next
OCRACES
Meeting is**

**April 2, 2012
1930 Hours**

840 N. Eckhoff Street,
Suite 104, Orange

Baker to Vegas Plans
Field Day Plans
Antenna Mast Support



Orange County Sheriff's Department
Communications & Technology Division



Elecraft K3 HF transceiver, P3 panadapter, and KPA500 solid-state amplifier are available in "no-soldering" kit form.

Continued on page 2

Captain's Corner *Continued from page 1*

Putting together a Heathkit was somewhat educational to new hams, and, in many cases, led young people toward a career in electronics, or toward obtaining an amateur radio license. SparkFun also focuses on education. Its online video tutorials, books, and kits provide a wide range of educational activities. Its “department of education” is designed to ensure that individuals can get the tools, knowledge, parts, and other resources they need to explore the world of embedded electronics.

SparkFun will host workshops on various areas of electronics technology including soldering, wireless, printed-circuit board (PCB) design, and prototyping. The company also plans to partner with schools to foster excitement about electronics and technology in the classroom to help meet the national priority of improving science, technology, engineering, and mathematics (STEM) education.

SparkFun's products include the Simon Says soldering kit and the Arduino inventor's kit. It uses all through-hole components, although another version of the kit is available with surface-mount parts. With the kit, users can practice soldering a 28-pin microcontroller chip, LEDs, battery clips, and other common components. Once you build it, you can play the game. You will also have a simple development platform for learning embedded controllers. There are five outputs for LEDs and a buzzer and five inputs for buttons and a serial port for debugging. The processor is an ATmega328, which is good for learning how to program Arduino products.

Another popular kit is the inventor's kit for the Arduino processor, which is designed to teach users how to program the processor. It's a good initial tool for embedded electronics. Projects including blinking LEDs, motor control, servo operation, making music, using the input buttons, implementing volume control, detecting light, reading temperature, and mixing LED colors. All parts and an instruction manual are supplied.

A Kit a Month

Rex Harper, W1REX, offers a one-year subscription to the QRPme Kit of the Month Club for \$180.00 (12 kits for \$15.00 per kit). A half-year subscription is six kits for \$18.00 per kit, and a three-month trial subscription is three kits for \$20 per kit. Customers won't be receiving a top-of-the-line kit each month for that price, but Rex says each kit will be useful and will have an educational content. QRPme offers many other kits of interest to beginners and old timers in amateur radio.

The Lil Squall JI Transceiver kit is QRPme's version of the venerable Pixie Transceiver. The \$35.00 kit fits in a

small personal size tuna can and has a silk-screened solder-masked PCB with plated through holes. A socket for the final transistor allows easy experimenting with output power. The feedback capacitors in the oscillator circuit also have sockets, making it easy to experiment with new bands. The crystal has a socket for easily moving the operating frequency about a band. The low-pass filter on the output is on a readily changeable band module. The kit comes with all the parts necessary to complete the transceiver, and includes a 7122-kHz crystal. All connectors are included and mount directly on the board.



QRPme Lil Squall JI Transceiver kit.

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A Learning Experience

Building kits helps newcomers learn the basics of electronics and builds confidence, as a “bag of parts” comes to life when put together into a complete piece of equipment. Ramsey Electronics, which has been providing electronic products and kits for nearly 40 years, says they make working with electronics not only fun but also a great learning experience. Their products and kits include AM and FM transmitters, hobby kits, video cameras, time and weather products, amateur radio gear, mini-kits, test equipment, etc. Ramsey says you don't just get a bag of parts and some instructions, but they also delve into circuit theory covering how and why it works, in a fun and easy-to-understand format.

Some of Ramsey's amateur radio products include a code-practice oscillator, CW keyer kit, Doppler direction finder kit, VHF mini-receiver, QRP receivers (for 20, 30, and 40 meters), preamps for 2 meters, 220 MHz, and 440 MHz, and QRP transmitters and linear amplifiers for 20, 30, and 40 meters.

The Ramsey DDF1 Doppler direction-finder kit includes a display unit (LED 22.5-degree bearing indicator) and all the parts necessary to build a four-point, five-piece magnetic antenna assembly. It operates on 12 Vdc and includes a matching 12 Vdc power plug. It connects easily to any FM receiver. The transmitter to be located with the DDF1 could be FM, AM, or CW. The DDF1 requires only a connection to your receiver's speaker jack and the radio's antenna. The whips can be cut and optimized to any frequency from 130 to 1000 MHz.

Next OCRACES Meeting: April 2nd

The next County of Orange RACES meeting will be on Monday, April 2, 2012, at 7:30 PM, at 840 N. Eckhoff Street, Suite 104, in Orange. At this meeting, Kenan Reilly, KR6J, will discuss the "K7JA Rocket Launcher" mast support system for quick deployment of antennas. Also at this meeting we will discuss our preparations for the Baker to Las Vegas Challenge Cup Relay and for Field Day.

B2V and Field Day Discussed at Breakfast

OCRACES Radio Officer Ralph Sbragia, W6CSP, led a discussion of preparations for the Baker to Las Vegas Challenge Cup Relay (April 21-22) and for Field Day (June 23-24) at a breakfast meeting on Saturday, March 24, 2012, at the Katella Grill. Also attending the meeting were Kenan Reilly, KR6J, Randy and Lee Anne Benicky, N6PRL and KI6VUH, Chief Radio Officer Ken Bourne, W6HK, Assistant Radio Officers Jack Barth, AB6VC, and Chuck Dolan, KG6UJC, Jim Dorris, KC6RFC, Joe Selikov, KB6EID, Marty Oh, KJ6RWE, and retired OCSO Emergency Communications Coordinator Walter Wilson, K7WWW. Arrangements for installing APRS equipment in the B2V follow vehicles, rooms at the Pahrump command post, and installations and vehicle checking at Baker were discussed. Regarding Field Day, we discussed our goals for training for quick field deployment and for enjoyable contest operation (without pressure to "make points"). Kenan emphasized our need to use our Cushcraft A-3S triband beam, and finding a way to install it on the Will-Burt mast. We would again like to use a Windom off-center-fed dipole on 80 and 40 meters, as built by John Roberts, W6JOR, at last year's Field Day. We would also like to use the SuperAntenna YP3 beam on 6 meters and other bands, owned by Radio Officer Scott Byington, KC6MMF. Our next Field Day planning breakfast will be at 8:00 AM on May 12, 2012, at the Katella Grill. After breakfast, we will go up to Craig Park and survey our Field Day site and practice some setups.

Winlink Committee Holds Meeting at OC EOC

Radio Officer Scott Byington, KC6MMF, launched an OCRACES Winlink Committee on March 10, 2012, with a meeting at the Orange County EOC. Also attending were Jim Dorris, KC6RFC, Kenan Reilly, KR6J, Marty Oh, KJ6RWE, Chief Radio Officer Ken Bourne, W6HK, John Bedford, KF6PRN, and Applicants Sean Reigle, AJ6B, and Hannah Kilbourne, KJ6LDW. Scott reviewed the status of the entire system and Kenan took notes. In addition to Winlink, other digital topics were covered to familiarize members and applicants, including D-STAR, Outpost, APRS, and Depiction. Terminal node controllers (TNCs) were also discussed, including the Kantronics KPC-9612+ and KPC-3+. To be discussed at later meetings will be Echolink, IRLP, modifying WRT54 routers for bridges, 2.4 GHz and 5 GHz data bridges, and possible satellite communications tools to fill in the void of OASIS. The next Committee meeting is March 31, 2012, at noon, at the Orange County EOC.

M² Introduces 1200-Watt 2-Meter Amplifier

M² Antenna Systems has introduced the 2M1K2 high-power 2-meter amplifier, using the new Freescale LD MS FET (MRFE6VP6IK25H), a single device specified to produce 1.25 kW with as little as 3 watts of drive. When driven with any level of RF up to 50 watts, the amplifier will produce a gain of about 14 dB. With no drive applied to the device, it will idle at approximately 800-900 mA. This condition puts the device in a class AB1 state. It is linear at this point, so drive of 5 W will cause the amplifier to produce 200+ watts. 50 watts of drive in any mode will allow the amplifier to produce 1200 watts minimum. If the drive power is continuous, such as FM or any JT mode, the amplifier will sense the continuous drive level and, after about 5 seconds, the bias voltage is reduced, pulling the amplifier closer to class C. This reduces the current drain typically from 36 A down to about 30 A and reduces the output slightly to 900 to 1000 W. When driven in the SSB or CW mode, the amplifier runs in the linear mode and delivers 1200 W+ peak to the antenna.

Dimensions are 6 × 7.125 × 13.5 inches, and its weight is 13 lbs. The optional integrated 2400-watt switching power supply adds another 7.5 lbs.

Preparing for Golden Guardian

The Golden Guardian exercise at the Orange County EOC will be held on Tuesday, May 15, 2012, from 8:00 AM to 4:00 PM. The exercise scenario is a major earthquake. The next City/County RACES & MOU drill will be the following Saturday, May 19th, from 9:00 AM to 11:00 AM, following the same scenario. Some training opportunities are offered to prepare for participating in the May 15th Golden Guardian exercise (which may require only one OCRACES participant), providing an overview of the exercise.

All participants in the Operational Area's Golden Guardian 2012 functional exercise are asked to take the Golden Guardian Overview course on Thursday, April 19, 2012, from 10:00 AM to 12 PM, or on Thursday, May 10, 2012, from 10:00 AM to 12:00 PM. This course is designed for personnel who will play a role in the OA's Golden Guardian 2012 exercise based on response to a catastrophic earthquake. The course will provide an overview of the exercise, the exercise scenario, as well as protocols and processes within the EOC. OCRACES members may take the Golden Guardian Overview class and participate in the Golden Guardian 2012 exercise even if they have not yet taken the SEMS/NIMS & EOC Orientation Class, the EOC Responder Section Training, and other EOC classes.

Plotter/Messenger/Hotline training will be offered on Tuesday, April 3, 2012, from 9:00 AM to 12:00 PM, and on Wednesday, April 18, 2012, from 1:00 PM to 4:00 PM, to Plotter Supervisor and Plotter staff, Messenger Supervisor and Messenger staff, Hotline Supervisor, and Hotline staff. This course is designed for personnel who may be assigned as Plotters, Messengers, or Hotline staff in the EOC. Training will include the proper display of important information on the status boards, how the messaging system works in the EOC, and how to operate the hotline. There will be hands-on training in the form of an exercise to practice gathering and plotting important information. Participants will practice on the hotline and will learn how to appropriately answer calls and manage trends and rumors, and will report information from callers to the Public Information Manager.

Situation Analysis Support Staff (SASS) training will be offered on Tuesday, April 12, 2012, to Situation Analysis Unit Leaders, Situation Analysis staff, Documentation Unit leaders, Documentation staff, and Plotter Group Supervisor. This course will focus on the Situation Analysis support function within the EOC. Staff members assigned to this role are responsible for gathering and documenting important information about how the emergency is impacting County agencies, special districts, school districts, cities, and other affected organizations. The course will include hands-on training on EOC forms and information flow.

Register for upcoming courses online in Training Partner: <http://trainingpartner.ocgov.com>. For assistance with accessing the Training Partner Web site, review the user guides online at <http://bos.ocgov.com/hr/trainingpartner/> or e-mail mchorn@ocsd.org.

Solving an Unusual RFI Problem

A recent post on a popular Yahoo Group revealed the solution to a perplexing RF interference problem. Tyler Suydam, KC2LST, had an RFI issue with his Samsung 46-inch LED TV. He tried everything he could think of, such as replacing the HDMI cable with an internally "ferrited" one, stringing lots of ferrites along the TV's CAT6 network cable and power cord, winding the power cord on several ferrite cores, etc. Nothing had any effect. Then Tyler stumbled across an Internet post by a broadcast engineer who provided advice to someone else having the same problem with a similar Samsung LED TV. During amateur radio operation at about 500 watts, the TV would randomly turn on, turn off, become locked in "demo" mode, change volume level, and become unresponsive to the remote control. Only unplugging/replugging the TV would render it again usable.

It turned out that the RF was triggering fluorescent lamps within the TV room, and/or the nearby kitchen, to emit infrared signals that were actuating the IR remote receiver on the TV. This happened whether the fluorescent lamps were on or off.

The solution was simple for Tyler. He uses Tivo and thus the remote for the TV is seldom needed. He taped a piece of black construction paper over the IR receiver window on the TV. He also needed to wrap it around the side and underneath the panel, since the IR was getting in from all angles. This solved the problem.

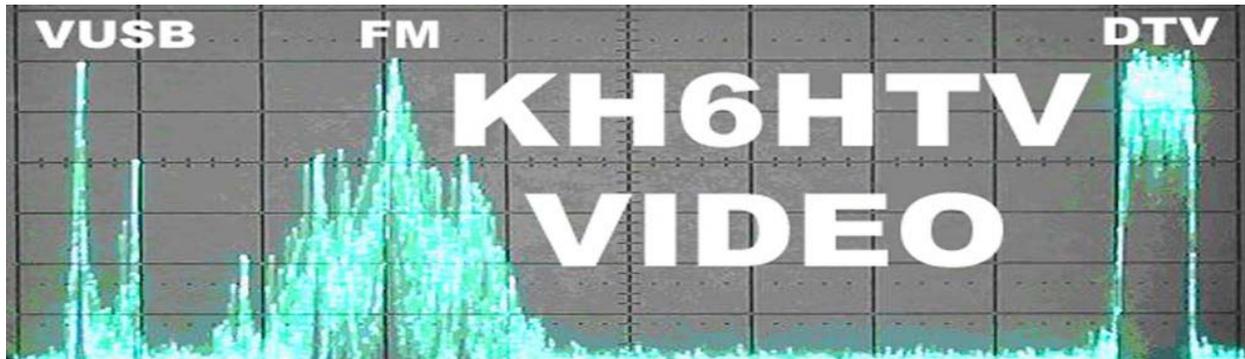
The broadcast engineer said this is a common issue at AM broadcast stations everywhere (where fluorescent ceiling lights are commonly used), and he had to physically remove IR receivers in devices located there or otherwise disable them.

Watching the Web

Web Sites of Interest to RACES Personnel

Digital Television Transmitters

<http://kh6htv.com/>



The KH6HTV VIDEO Web site describes a line of 70-cm digital and analog ham TV transmitters. The digital transmitters generate high-definition 720p or 1080i, 64-QAM signals. The analog transmitters generate spectrally clean, standard-definition, 480i, NTSC, vestigial upper sideband (VUSB). Reception is very easy, as these are exactly the modulation formats used on cable TV (CATV). A conventional, home, analog/digital TV receiver will receive these signals. Various models are offered for portable pack-set, mobile, base, and repeater applications. Available output powers range from 1 watt to 25 watts for analog and 1 watt to 5 watts for digital.

Current products are designed for use in the 70-cm (420-450 MHz) ham band. They are fully synthesized and operate on cable channels 57 through 61. They all include as a standard accessory the Model 70-2C, NTSC, 480i, VUSB-TV exciter. They can also be used with the optional Model 70-3, high-definition (720p or 1080i, 16:9), DTV exciter to produce a 64-QAM, digital TV (DTV) signal.

All transmitters operate from +12 Vdc. The 1-watt unit is intended for portable, back-pack operation from a gel-cell battery. The higher power units require more current and are intended for mobile, base-station, and repeater applications. The low-power Model 70-4 is intended for use as the exciter and driver amplifier for the Model 70-8, high-power amplifier (25-watt analog or 5-watt digital).

Several application notes appear on this Web site. One of the most interesting is “Field Trials Comparing VUSB, FM, DVB-S & 64QAM Television,” which summarizes the results of field trials run in September 2011 by hams in Denver, Colorado. The VUSB and QAM transmitters operated on the 70-cm band and had output powers of 1 watt (+30 dBm). The DVB-S and FM transmitters operated on the 23-cm band and had output powers of 10 watts (+40 dBm).

Jim Andrews, KH6HTV, drew several interesting conclusions from these field trials. For in-motion video, DTV doesn't work. The least objectionable mobile flutter is with VUSB-TV. All systems were susceptible to multipath interference. Its effect was least objectionable with VUSB-TV. For DTV, it could cause the system to fail completely. Directional antennas instead of omnidirectional antennas usually helped to suppress multipath effects on both analog and digital TV. DTV always had the best picture quality. They had either a perfect P5 picture or no picture. The “Cliff Effect” going from no picture to perfect picture is typically 1 to 2 dB in signal strength. FM-TV ranks second relative to DTV in its ability to provide a P5 picture with a weaker signal. With no multipath present, a signal-to-noise ratio of 13 to 15 dB assures an almost perfect picture. For general ham, wide-area coverage, where the user does not expect a perfect picture, VUSB-TV is best. For the most reliable, fixed, point-to-point transmissions, FM-TV should be used. The only distinct advantage DTV has over conventional TV is the ability to transmit true, high-definition, 1080i, video and CD quality audio. For transmission of standard-definition, 480i video, Andrews would always choose FM-TV over DTV. DVB-S DTV consumes a lot less spectrum compared to RM-TV for standard-definition, 480i video. In the 70-cm ham band, Andrews would not recommend 64-QAM TV on any channel except 57.1 (420-426 MHz). When used on any other 70-cm channel, its spectrum, which consists of high-powered white noise sitting upon a rectangular pedestal, will significantly raise the noise floor for all other hams using CW, SSB, moon-bounce, satellites, etc. Channel 57 sitting at the bottom of the 70-cm band is used almost exclusively only for ham TV.

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 in Orange County.

Please send your news to NetControl Editor Ken Bourne, W6HK, at: w6hk@ocraces.org

Hospital Disaster Support Communications System (HDSCS)

It was nearly an all-nighter for HDSCS members on February 24, 2012 as Western Medical Center in Santa Ana performed an upgrade of its electrical system. A team of HDSCS operators was in place at 10:00 PM as power was shut down for the work. Their mission was to provide backup for critical unit-to-unit links as well as to the outside world if the telephone system were to fail during this activity. Operators were stationed in the Emergency Department, Surgery, Intensive Care, Pharmacy, Telecommunications, and Facilities. As it turned out, no telephone outages occurred, but the hospital appreciated their preparedness and it was an excellent communications drill for them. Work continued throughout the night until power was restored around 4:30 AM. After a hold to make sure that everything was stable, HDSCS operations were secured at 5:15 AM. Team leaders on site were Paul Broden, K6MHD, and Ken Simpson, W6KOS. Others taking shifts in hospital



Working a shift at Western Medical Center are Fred Wagner, KQ6Q, and Dave Reinhard, KJ6REP (standing) and Clay Stearns, KE6TZR, and Rebecca Katzen, KI6OEM (seated).

units were Richard Deen, KI6HWY, Rebecca Katzen, KI6OEM, Bob McCord, K6IWA, Dave Reinhard, KJ6REP, Chris Sanders, KE6BRY, Gary Sanders, KC6TWZ, Clay Stearns, KE6TZR, Fred Wagner, KQ6Q, and Dave West, KI6EPI. The outside link operator was April Moell, WA6OPS, at her home base station. She coordinated the arrivals of the shifts of operators and kept the Orange County Emergency Operations Center apprised of the hospital's status. Four additional members were on alert at home throughout the night, ready to deploy quickly if the operation had lasted longer.

County of Orange RACES

Congratulations to Marty Oh, KJ6RWE, who passed background and became a member of County of Orange RACES on March 20, 2012. He has been assigned to South Squad. Marty has shown his eagerness to contribute to OCRACES activities, including meetings and nets, and attending meetings of City RACES units. He is also a member of the OCRACES Winlink/Digital Committee. He has passed the FEMA ICS-100, 200, and 700 courses.

Marty is a Customer Application Engineer with Western Digital. Previously, he was on the Toshiba America Notebook Development Team. He was previously with the California Governor's Office of Emergency Services, and was a U.S. Marine Corps Reserve. He has also owned a business, was a County of Orange Planner, and is a freelance wedding photographer. He is a Class B shuttle-bus driver for his church and leads a Native American Indian Mission team to Utah during the month of June.

Marty acquired his Technician Class license on October 12, 2011, and his General Class license on February 10, 2012. His favorite amateur radio activities include experimenting with antennas, buying and selling radios, and learning new things about radio communications. He currently owns two HF transceivers, two mobile rigs, and three HTs.

April 2012

| Sun | Mon | Tue | Wed | Thu | Fri | Sat |
|--------------------------|---|-----|--------------------------|-----|-------------------------|--------------------------|
| 1 | 2 <i>OCRACES Meeting & Weekly ACS Net</i> | 3 | 4 | 5 | 6 | 7 |
| 8 | 9 <i>Weekly ACS Net</i> | 10 | 11 <i>OCCARO Meeting</i> | 12 | 13 <i>OCARC Meeting</i> | 14 |
| 15 | 16 <i>Weekly ACS Net</i> | 17 | 18 | 19 | 20 | 21 <i>Baker to Vegas</i> |
| 22 <i>Baker to Vegas</i> | 23 <i>Weekly ACS Net & SWACS Freq. Test</i> | 24 | 25 | 26 | 27 | 28 |
| 29 | 30 <i>Weekly ACS Net</i> | | | | | |

Upcoming Events:

- **Apr 2:** OCRACES Meeting, 1930 hours, 840 N. Eckhoff Street, Suite 104, Orange
- **Apr 11:** OCCARO Meeting, 1930, Red Cross, Santa Ana
- **Apr 13:** Orange County Amateur Radio Club Meeting, 1900, Red Cross, Santa Ana
- **Apr 23:** Southwest ACS Frequency and Radio Test, 2015 hours
- **Apr 21-22:** Baker to Las Vegas Challenge Cup Relay
- **May 15:** Golden Guardian Exercise, 0800-1600 hours, OC EOC
- **May 19:** City/County RACES & MOU Exercise, 0900-1100 hours
- **Jun 14:** EOC Responder Section Training, 1000-1200, OC EOC
- **Jun 23-24:** Field Day
- **Jun 25:** City/County RACES Meeting, 1900 hours, 840 N. Eckhoff Street, Suite 104, Orange



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

- 10 m: 29.640 MHz output, 29.540 MHz input, 107.2 Hz PL (off the air)
- 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: 147.480 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: 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)
- 23 cm: 1282.025 MHz output, 1270.025 MHz input, 88.5 Hz PL

*Primary Net—Mondays, 1900 hours

Program Coordinator
Marten Miller, KF6ZLQ
(714) 704-7917

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

Radio Officers (Lieutenants)
Scott Byington, KC6MMF
Harvey Packard, KM6BV
Ralph Sbragia, W6CSP

Assistant Radio Officers (Sergeants)
Jack Barth, AB6VC
Chuck Dolan, KG6UJC
Jim Carter, WB6HAG
Ernest Fierheller, KG6LXT

County of Orange RACES

OCSD/Communications & Technology
840 N. Eckhoff St., Suite 104, Orange, CA 92868-1021
Telephone: (714) 704-7917 • Fax: (714) 704-7902
E-mail: ocraces@comm.ocgov.com

County of Orange RACES

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

Telephone – (714) 704-7917
Fax – (714) 704-7902
E-mail – ocraces@comm.ocgov.com

Visit Our Web Site
<http://www.ocraces.org>
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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 Harvey Packard KM6BV Ralph Sbragia W6CSP Marten Miller KF6ZLQ Robert Stoffel KD6DAQ



Jack Barth AB6VC Jim Carter WB6HAG Chuck Dolan KG6UJC Ernest Fierheller KG6LXT John Bedford KF6PRN Randy Benicky N6PRL



Bill Borg KG6PEX Jim Dorris KC6RFC Nancee Graff N6ZRB Ray Grimes N8RG Walter Kroy KC6HAM Martin La Rocque N6NTH



Brian Lettieri KI6VPF Marty Oh KJ6RWE Kenan Reilly KR6J John Roberts W6JOR Joe Selikov KB6EID Tom Tracey KC6FIC Brian Turner KI6WZS