

October 2015



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

Ham Equivalent to FirstNet?

Public-safety radio is progressing in an exciting direction toward utilizing LTE (Long Term Evolution) technology commercial standards. The effort is led by FirstNet, which broadly defines its LTE network in distinct layers—Core Network, Transport Backhaul, Radio Access Network (RAN), and Public Safety Devices. It's a broadband network somewhat resembling cellular systems, and the public-safety devices are all user access points that will send and receive information over the network. Smartphones, laptops, tablets, dongles, and a wide variety of specialty devices will be developed for FirstNet users. As a result, public-safety land-mobile radios will resemble today's smartphones. What about amateur radios? Will they eventually resemble smartphones also?

Yes, according to Bruce Perens, K6BP, who talked about the Algoram *Katena* hand-held SDR (software-defined radio) at the recent HAMCON in Torrance. *Katena* is a hand-held 50-1000+ MHz transceiver "unlike anything that exists today," says Perens. Your cell phone, tablet, laptop, or desktop is the user interface, connecting to the radio via WiFi or Bluetooth. The GUI (graphical user interface) runs in a Web browser, accessing the system's microphone through the browser, without the need to install any software at all.

Digital apps can run on a cell phone, and therefore can run on *Katena*. It will be compatible with D-STAR, DMR, APCO Project 25, FreeDV, or System Fusion. Non

-voice apps such as APRS, radio Web pages, and video will also be supported. Narrow-band, wide-band to 1.5 MHz, and direct-sequence spread spectrum are support. High-speed data and HD (high-definition) video are possible. The TDMA (time-division multiple access) repeater mode uses only one frequency for both input and output, and does not require a duplexer. Full duplex is possible. It is capable of mesh networking. It has an interface for a CW paddle, and an open-drain output for amplifier control.

The low-power-drain *Katena* includes an on-board computer and flash-based gate-array. Software is open source. Gate-array code and the hardware design are fully disclosed and with minimal restrictions for radio-amateur use. The device is an open platform for developers, as well as an end-user system. Its capabilities will evolve over time as developers follow their own ideas.

All of the ICs used are publicly available and publicly documented. Since third parties can purchase all necessary ICs, can burn firmware and gate-array code, and can adapt existing code to new ICs, the device is 100% third-party repairable, now and in the future, according to Perens.

Katena has many I/O buses—Ethernet, USB-on-the-go, a socket that fits a Raspberry Pi daughter card, GPIO (general-purpose input/output), SPI (serial peripheral interface), and serial. It supports a 10-MHz external reference, such as a GPS-disciplined or rubidium oscillator. It is protected for automotive power fluctuations and ESD (electrostatic discharge).

**The Next
OCRACES
Meeting Is**

**October 5, 2015
1930 Hours**

840 N. Eckhoff Street,
Suite 104, Orange

ATV
Roger Berchtold,
WB6HMW



October 3rd City/County/MOU Drill on El Niño

The next City/County RACES & MOU drill is scheduled for Saturday, October 3, 2015, from 0900 to 1100 hours. All OCRACES members are asked to arrive at the Orange County EOC at 0830 for orientation.

Generally, the purpose of countywide exercises is to stress the emergency amateur radio communications network, discovering the best and worst of amateur emergency radio traffic protocols, communications equipment linkage, message corruption, and exchange rates, while providing each City RACES unit a platform to work with other organizations such as the Hospital Disaster Support Communications System (HDSCS). The purpose of the exercise is to expose strengths and weaknesses among the various volunteer emergency communications organizations.

The disaster scenario for the exercise will be flooding. Each City shall construct messages (a minimum of eight), then transmit to a predetermined set of other cities while exchanging message traffic with OCRACES and the HDSCS.

The October 3rd test shall exercise the Orange County amateur emergency communications system and determine the quality of its performance set against a disaster event. The focus of the exercise is to determine:

- Quality and quantity of radio message exchanges
- The digital capability of the system through radio-aided e-mail or Winlink message exchange

City RACES teams shall generate outgoing messages (maybe an e-mail message and one Winlink message) using repeaters and simplex radio between OCRACES and participating cities.

The City RACES and OCRACES radio frequencies listed in the 2015 “Yellow Book” shall be used for this test event, unless changed by OCRACES or a City radio coordinator.

Exercise Scenario

According to the scenario, on October 3, 2015, at 0850 hours, numerous EOCs have been activated. The 2015 El Niño, which is even more powerful than the one in 1997, has created severe weather and storms throughout Southern California. Twelve inches of rain have fallen in the last eight hours, creating major flooding throughout Orange County and mudslides in the mountain regions. Baseball-sized hail has been reported in several cities. The storm is expected to continue for several more days. Sea level has risen to its highest recorded levels, flooding all of the coastal areas. Due to the high sea level, the rain water is not draining properly and is backing up into major streets.

The flooding has rendered many landline phone systems unusable and the cell-phone towers continue to be overloaded with a substantially large call volume. Power outages have occurred throughout 40% of Orange County. Evacuations are necessary in some heavily flooded areas.

Exercise Plan

Several modes of communications will be used during this drill (General Exercise, Simplex, Winlink, and HF NVIS). Each mode is optional and will depend on the specific training desired by each organization. Agencies are welcome to add elements to their own internal participation if they wish, such as deploying personnel to field locations to conduct “damage assessment,” or to locate simplex relay points.

The primary focus of the General Exercise will be communicating by voice between a City EOC and surrounding City EOCs, as well as with MOU agencies and the County EOC by sending and receiving general messages in accordance with the communications plan and participant expectations. In addition to sending outgoing message traffic, each agency must have someone monitoring their primary channel for incoming message traffic. City/County RACES to City RACES voice traffic will use the receiving City’s primary frequency as published in the 2015 “Yellow Book.” City RACES to County RACES will use the 449.100 MHz repeater (primary) or the 146.895 MHz repeater (secondary). City RACES voice to HDSCS will use the 146.970 MHz repeater; HDSCS may direct to another frequency.

In the Simplex Communications plan, City/County/MOU agency to City/MOU agency voice communications will use the primary simplex frequency as published in the 2015 “Yellow Book.” City RACES to County RACES voice will use 147.480 MHz (primary) or 146.520 MHz (secondary).

Cities participating in this exercise will be challenged to send and/or respond to messages using Winlink. All agencies should use their tactical Winlink addresses only (such as CAORCO for OCRACES). Each participating organization should request an e-mail to be sent to them. Do not send messages to “all” or “reply all.” Document the results. Winlink RMS sites include W6ACS-10 (431.475 MHz, Loma Ridge), W6ACS-11 (431.125 MHz, Olinda), and W6ACS-12 (431.075 MHz, San Clemente).

The frequency for the HF NVIS component of this exercise is 7250 kHz, lower sideband. The objective is to test 40-meter propagation throughout the County, in the event of repeater failure during an extended power outage, or lack of repeater coverage in deep canyon areas.

ATV at October 5th OCRACES Meeting

The next OCRACES meeting is on Monday, October 5, 2015, at 7:30 PM, at 840 N. Eckhoff Street, Suite 104, in Orange. At this meeting, Roger Berchtold, WB6HMM, will give a presentation on amateur television. He will mention the 5-watt 434-MHz ATV transmitter he built in 1972, while using a battery-powered UHF converter as the front end. He will also describe the equipment he is using now to communicate through the W6ATN ATV repeater. Roger will give recommendations on how to get started in ATV.

OCRACES Receives Tsunami Advisory

On Wednesday, September 16, 2015, at 3:55 PM PDT, an 8.3 magnitude earthquake struck off the coast of central Chile, generating a tsunami advisory for the Southern California coast. Tsunami advisories mean that a tsunami capable of producing strong currents or waves dangerous to persons in or near the water is expected or is already occurring. Areas in the advisory should not expect widespread inundation. Tsunamis are a series of waves dangerous many hours after initial arrival time. The first wave may not be the largest. The NWS National Tsunami Warning Center in Palmer, Alaska, issued the advisory for coastal areas between and including San Onofre State Beach to Ragged Point, California (50 miles northwest of San Luis Obispo). People located in this coastal area were requested at 4:00 AM to “move off the beach and out of harbors and marinas” because of dangerous currents. Dana Point Harbor closed at 2:00 AM. No evacuations were ordered. The National Weather Service estimated that the start time for arrival at Newport Beach would be 4:46 AM on September 17th.

OCSD Communications & Technology Division Director Robert Stoffel, KD6DAQ, advised OCRACES that the Orange County EOC would be activating primarily for staffing the hotline and monitoring the situation. No RACES assistance was requested at that time. However, OCRACES was prepared to activate if needed.

OCSD Emergency Management Division activated the EOC and coordinated conference calls with all affected jurisdictions. If the tsunami had been major, 125,000 people could have been at risk, and jurisdictions would have then decided to close or evacuate beaches.

At 6:00 AM on September 17th, all beaches, harbors, piers, and marinas in the Cities of Seal Beach, Huntington Beach, Newport Beach, Laguna Beach, Dana Point, and San Clemente, including County and State beaches, reopened. Although no significant coastal flooding occurred, a high likelihood remained of strong currents and waves dangerous to persons in or near the water. These strong currents might have continued for several hours, and could have been hazardous to swimmers, boaters, and coastal structures. The Public Information Hotline remained open until 7:00 AM, and the Orange County EOC deactivated at that time.

At 12:19 PM on September 17th, NWS canceled the event for Orange County. A tsunami was generated by this event but no longer posed a threat to the Orange County coast. NWS advised that some areas may see small sea-level changes and ongoing surges, and left it up to local authorities on whether to re-occupy hazard zones.

This tsunami advisory meant strong currents were likely and that individuals should stay away from the shore. If this had been only a tsunami watch, the danger level would not yet have been known and individuals would need to stay alert for more information, according to the National Weather Service. A tsunami warning, on the other hand, would have meant that an inundating wave is possible and evacuation is suggested.

OCSD Assistant Emergency Manager Vicki Osborn advised *The Orange County Register* (in an article by Scott Schwebke in the September 28, 2015 edition) that the EOC is able to disseminate information through AlertOC, which notifies residents of emergencies by cell phone, e-mails, and home phones if they have signed up for the service at alertoc.com. Alerts and advisories are also issued through social media such as Twitter. San Clemente, Dana Point, Newport Beach, and Huntington Beach have siren systems to alert residents to seek higher ground during a tsunami warning. Since this was an advisory and not a warning, sirens were not activated.

Coastal cities have street signs and maps on their Web sites, showing evacuation routes from tsunami inundation areas, according to Osborn. The size of inundation zones varies, depending on topography. For example, Huntington Beach has a large zone because it is flat and densely populated, but Dana Point's zone is smaller because it has more cliffs and fewer residences. About 70,000 residents, not including tourists, would have to leave Huntington Beach during a full-scale evacuation, according to the city's Emergency Services Coordinator Brevyn Mettler, KI6FRG.

The Chile earthquake gave Orange County several hours to evaluate whether or not to evacuate coastal areas. However, Osborn said a local major quake, such as near Catalina Island, would give only 15 to 20 minutes to evacuate.

HAMCON Covers Technology and EmComm

The ARRL Southwestern Division Convention (HAMCON) on September 11-13, 2015, at the Torrance Marriott South Bay Hotel included “Tech Talks” and exhibits of interest to radio amateurs and, especially, to RACES members. Ken Bourne, W6HK, and Bob McFadden, KK6CUS, attended a session by Bruce Perens, K6BP, on “Smarter than a Smartphone: Meet Katena, The New Smart HT and Its Software,” describing a handheld software-defined radio that covers 50 to 1000+ MHz, programmable for any mode, containing its own Linux server, and using your smartphone (or any computer or tablet) as the front panel. While Bob attended other sessions, Ken attended a session by Steve Hicks, N5AC (FlexRadio), on “Advances in Software Defined Radio. Other sessions covered transmitter hunting by Joe Moell, KØOV, backup hospital communications by April Moell, WA6OPS, emergency communications by Duane Marriotti, WB6RER, reporting emergencies by Chris Storey, KA6WNK, AREDN (Amateur Radio Emergency Data Network) by Andre Hansen, K6AH, and emergency communications trends by Gary Wong, W6GSW.



Ken Bourne, W6HK, speaks at HAMCON.

At a session on “Present and Future of County-Affiliated Disaster Amateur Radio,” OCRACES Chief Radio Officer Ken Bourne, W6HK, talked about how OCRACES serves Orange County as an auxiliary communications unit of the Orange County Sheriff’s Department, administered by the Communications & Technology Division. He mentioned that members must hold at least a Technician Class amateur radio license, and are trained to provide voice, video, and data communications during emergencies, using their own equipment. Ken mentioned the bands used by OCRACES, including the use of Near Vertical Incident Skywave (NVIS) propagation on 40 and 75 meters to communicate with Cal OES and into deep canyons not covered by repeaters. He discussed digital modes including Winlink, D-STAR, and APRS. He described the equipment used in the EOC RACES Room and in the van. Ken described what OCRACES does, such as relaying messages from Incident Commanders to the EOC, reporting status or conditions from field locations, coordinating mutual-aid communications between City RACES units, conducting training exercises, providing communications for secure ballot transportation after elections, providing vehicle-location status (such as Baker-to-Vegas), locating interference (and practicing during cooperative T-hunts), participating in Severe Fire Weather Patrols, transmitting AMBER Alert information, interfacing with non-government agencies, setting up portable repeaters for special missions, and supporting special events (such as OCFA and OCTA). OCRACES Training Officer Tom Tracey, KC6FIC, was also at this session, available to answer questions. Following Ken’s presentation, Los Angeles County DCS Chief Communications Officer Robert Sussin, WK6W, gave a similar presentation on LACDCS capabilities.

After Action Report Issued on Surf Quake 2015

The OCSD Emergency Management Division issued a detailed After Action Report/Improvement Plan on Surf Quake 2015, which occurred on May 21, 2015. The scenario was a magnitude 7.2 earthquake occurring along the Newport-Inglewood Fault. The epicenter was in Huntington Beach, which is the south end of the fault. The rupture moved north, activating the entire fault from end-to-end. The rupture caused severe to moderate shaking throughout all of Orange County. The earthquake impacted water levels, but did not cause a tsunami.

As with any exercise, the objective was to determine strengths and areas for improvement in the core capabilities. The RACES component of the Operational Communications Core Capability in this exercise showed that RACES members were engaged and communicated frequently with the Water Emergency Response of Orange County (WEROC) EOC via telephone. Furthermore, the Communications/Alert & Warning Unit Leader appropriately coordinated with the Control One Supervisor and RACES volunteers to find solutions to all injects presented. During the exercise, the RACES players learned that if WEROC misses an OA radio call, press releases issued from the Operational Area prior to STARTEX (start of exercise) and distributed throughout the OA EOC are to be e-mailed, rather than telephoned, to WEROC from the EOC liaison or the PIO Support Staff positions. In future exercises and activations, RACES will know which EOC positions have access to e-mail press releases within the EOC to requesting jurisdictions.

The Surf Quake 2015 exercise was a valuable experience for RACES as well as other participating units. Details of the OCRACES participation are on page 5 of June 2015 *NetControl*.

Are You Ready to ShakeOut?

The Great California ShakeOut is coming this October! You could be in any location when an earthquake occurs. Keep yourself safe by planning for and practicing a form of the Drop, Cover, and Hold On Drill appropriate for you and, as needed, for colleagues who may require assistance, in your location on October 15, 2015, at 10:15 AM.

Get Ready to ShakeOut.

October 15, 2015 Register Now at www.ShakeOut.org

**Shake
Out**

There are many different ways to protect yourself! Check out these informational Web pages:

- Recommended safety actions (including situations when you cannot get beneath a table): http://www.earthquakecountry.info/downloads/ShakeOut_Recommended_Earthquake_Safety_Actions.pdf
- Key earthquake safety tips for individuals with disabilities and other access or functional needs: http://www.earthquakecountry.info/downloads/ShakeOut_Earthquake_Tips_Disabilities_AFN.pdf
- Resources for tribes/rancherias, nonprofit organizations, schools, colleges, businesses, healthcare, and care providers of young children, all available on the ShakeOut website: <http://www.shakeout.org/california/localgovernment/>
- For a visual and subtitled demonstration of how individuals with mobility limitations, disabilities, and other access/functional needs can protect themselves during an earthquake, see the Cal OES informative videos that demonstrate steps to take and key considerations (scroll down the page to locate them): <http://www.caloes.ca.gov/Cal-OES-Divisions/Access-Functional-Needs>
- The seven steps to earthquake safety: <http://earthquakecountry.org/sevensteps/>

In 2014, when drill participation soared to 10.4 million, local governments were able to use the ShakeOut drill as a catalyst to review their emergency operations plan, exercise their evacuation plan, test communications, update policies and procedures, activate a departmental operations center, update emergency supplies kits, and hold an employee safety fair.

The drill only takes a minute and practice helps turn a thought into an action that comes more naturally when surprised by a sudden event like an earthquake. The goal is to keep everyone safe by practicing preparedness! For more information, see <http://www.shakeout.org/california/>.

RACES/ACS and ARES Assist at Wildfires

As we gear up for a potentially bad fire season in Orange County, we observe the good work that RACES and ARES members are doing in Northern California in their wildfire battle. For example, ARES volunteers in Amador County supported communications at a Red Cross shelter housing evacuees from the Butte wildfire. According to ARRL Sacramento Valley Section District 3 EC Greg Kruckewitt, KG6SJT, ARES/ACS volunteers were called out late on September 9th, and Amador County ARES EC Daniel Edwards, KJ6WYW, had communications set up at the shelter by midnight. He scheduled operators to work the shelter station 24 hours a day. Kruckewitt said he was called in early the next morning.

During the activation, members of Yolo County and Sacramento County ARES spelled the Amador County operators at the shelter. "This gave the Amador County members a break and some time off to help their neighbors evacuate their positions," Kruckewitt said. Edwards said 20 operators took part in the activation, with two operators per shift. The station at the shelter was active for 120 hours.

With more roads in the area reopening and some evacuees able to return home, Amador County ARES was released from supporting Red Cross shelter communications early on September 14th. Kruckewitt noted that "If, for some reason, the fire again changes direction, it is possible that Amador ARES could be called out again." ARES/RACES volunteers also have been supporting communications at shelters in Calaveras County, in the ARRL San Joaquin Valley Section.

The Butte Fire is raging southeast of Sacramento in the Stanislaus National Forest region. Firefighters report "extreme fire behavior" and mandatory evacuation orders as well as road closings remain in effect. As this article is being written on September 26th, 70,868 acres have burned, and the fire is 93% contained. Structures destroyed included 475 residences and 343 outbuildings, and 42 structures have been damaged.

Meanwhile, the Valley Fire west of Sacramento has destroyed 1,958 structures, and damaged 93. As of September 26th, 76,067 acres have burned, with 95% containment. ARES organizations in Lake and Napa Counties are active. The fire has been threatening critical communications infrastructure in the Geysers area as well as the Adalin Power Plant.

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

Orange County Transit Authority

County of Orange RACES had a booth at the Orange County Transit Authority's 2015 Bus Rodeo and Carnival Disaster Preparedness Expo. This was OCTA's first ever employee and family Disaster Expo, which took place on Saturday, September 19, 2015, at the agency's Santa Ana Bus Operations and Maintenance Base. Representing OCRACES at the event were Chief Radio Officer Ken Bourne, W6HK, Fran Needham, KJ6UJS, and Tom Riley, K6TPR. Other participating organizations included OCTA Security & Emergency Preparedness (Event Lead), OCTA Wellness, Orange County Sheriff's Department/Transit Police Services, Orange County Fire Authority, ReadyOC (Westbound Communications), ReadyAmerica, Southern California Animal Response Team (SCART), and OCTA Facilities Maintenance (Support Role).



Tom Riley, K6TPR (left), and Fran Needham, KJ6UJS, at OCRACES booth at the OCTA Disaster Expo.

The overall purpose of this Disaster Preparedness Expo was to educate OCTA employees and their immediate family members on the preparedness steps that need to be taken before a major incident or disaster. The goal of this preparedness was to promote the self-sufficiency of families and support the return of employees back to

work after a disaster at OCTA as disaster service workers.

Huntington Beach RACES

Huntington Beach RACES Chief Radio Officer Steve Graboff, W6GOS, reported that on September 19, 2015, HBRACES conducted the 800-MHz failure "Shadow Drill" where its members were assigned to each fire apparatus (engines, trucks, ETs, HazMat, and BC, etc.) covering the entire



HBRACES Members with Fire apparatus at "Shadow Drill."

City of HB as well as to the HB PD 911 dispatch communications center and the Fire Department Operations Center. The drill lasted 10 hours and was purposed to simulate failure or overload of the 800-MHz system with HBRACES then providing all HB Fire dispatch and tactical communications. HBRACES dispatched via 2-meter and 440-MHz amateur radio a record 34 calls and made many more tactical communications from the field units to the FDOC command center over ham radio. Members were supported, with great enthusiasm, by the HB Fire Staff, who participated in the exercise with them. The event was a resounding success and reinforced the HBRACES position to provide seamless amateur radio dispatch and tactical communications to HB Fire (as well as HB PD), should the need arise. Graboff said, "We are proud to be the only city (that we know of) in Orange County that can provide this vital service, and we are willing to teach our method to any other city, should they so desire."

October 2015

Upcoming Events:

Sun	Mon	Tue	Wed	Thu	Fri	Sat
				1	2	3 <i>City/County RACES & MOU Drill</i>
4	5 <i>OCRACES Meeting & Weekly 2 m ACS Net</i>	6	7	8	9	10 <i>Weekly 40 m ACS Net & ARRL EC-001 Course</i>
11	12 <i>Weekly 2 m ACS Net & Cooperative T-Hunt</i>	13	14	15 <i>Great California ShakeOut</i>	16	17 <i>Weekly 40 m ACS Net & ARRL EC-001 Course</i>
18 <i>OCSD Reserve Bureau BBQ</i>	19 <i>Weekly 2 m ACS Net</i>	20	21	22	23	24 <i>OCFA Open House</i>
25	26 <i>All-Band ACS Nets & SWACS Radio Test</i>	27	28	29	30	31 <i>Weekly 40 m ACS Net</i>

- **October 3:** City/County RACES & MOU Drill, 0900-1100
- **October 5:** OCRACES Meeting, 840 N. Eckhoff Street, Suite 104, Orange, 1930-2130
- **October 10:** ARRL "Introduction to Emergency Communications (EC-001)" (Part 1), OC Red Cross Chapter Office, Room 208, 600 Park Center Drive, Santa Ana, 0800-1700
- **October 12:** Cooperative T-Hunt on input of 2-meter repeater
- **October 15:** Great California ShakeOut, 1015
- **October 17:** ARRL "Introduction to Emergency Communications (EC-001)" (Part 2)
- **October 18:** OCSD Reserve Bureau BBQ, Irvine Lake, 1130-1600
- **October 24:** OCFA Open House, 1 Fire Authority Road, Irvine, 1000-1500
- **October 26:** Southwest ACS Frequency/Radio test, 2030
- **November 17:** Mutual Agency Regional Radio Interoperability Training Exercise (MARRITE)



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

Meet Your County of Orange RACES Members!



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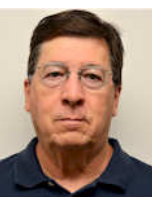
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