



RF



ORANGE COUNTY AMATEUR RADIO CLUB, INC.

VOL. XLII NO. 7

P.O. BOX 3454, TUSTIN, CA 92861-3454

JULY 2001

The Prez Sez:

Field day has been declared a major success. All antennas went up and quickly became active on all bands. Our stations were in motor homes and also open air sites. Three in particular were great public relations sites. Chris with his Satellite setup located just outside the 20-meter motor home had first crack at the public entering the park. Then directly facing the main sidewalk to the center of the park we had the 40-meter EZ-UP canopy with the backup tent just behind that. And finally there was the solar setup that was along the same sidewalk and used a park bench as it's only structure.

40-meters definitely had the welcome mat out for the public. What a great way to show off ham radio.

That turned out to be a precursor to presenting Amateur Radio to the public during the July 2001 Orange County Fair. Our club has accepted July 18th as OCARC Day. I have slots still open for volunteers to work the Ham Booth from Noon to 3:30, or from 3:30 to 7:00 PM, or from 7:00 to 11:00 PM. To go along with the opportunity to enjoy the booth you also get a free pass to the fair for that day. Please call me to reserve a spot. If you wish to

have me call you, then please page me at (714) 844-7561.

Mr. or Ms. RF will soon make an appearance at the monthly club meetings. Please say hi and shake hands with all that attend the meetings. You just might be the lucky recipient of extra raffle tickets for being the correct person to contact the Mystery Ham.

Have a great summer and see us at the Fair. The theme is TWIST & SHOUT; celebrate citrus and sun.

73,

Bob KD6BWH

ALINCO SHIFTS NORTH AMERICAN DISTRIBUTION, SERVICE TO OHIO FIRM

Amateur Radio manufacturer Alinco has closed its US branch in Torrance, CA, and shifted its North American distribution to an Ohio firm. Alinco product distribution and customer service now are being handled by Atoc Amateur Distributing LLC in Covington, Ohio. The change was effective May 1.

A news release posted on the Alinco Web site says that Alinco will continue to be "a very committed, viable player in the Amateur Radio

Please see **Alinco** on Page 6

The July Program:

Ken Konechy - W6HHC, will speak on Fuel Cells... how they work... why they are better than batteries... and what the few remaining problems are. In a few years, your notebook computer will probably use a Fuel Cell instead of a battery... and maybe your handheld will, too! Don't miss this program.

Don't miss our next **meeting** on:

**Friday, July 20th
@ 7:30 PM**

We will meet in the **Anaheim** Room in the east Red Cross Bldg.

<i>In This Issue:</i>	<i>Page</i>
THE PREZ SEZ	1
ALINCO SHIFTS N.A. OPS.....	1
JULY'S PROGRAM	1
CLUB INFORMATION	2
VISIT MARCONI'S HOUSE	3
TECH TALK: RF Exposure III ...	4
MPE EQUATIONS SIDE BAR...	6
JULY BOARD MINUTES	7
FIELD DAY NOTES	7
FIELD DAY COLLAGE	8
FIELD DAY SCORES.....	9
JUNE MEETING MINUTES	10

Reminder:

**AUGUST 4th 2001
Next Club Breakfast
and Board Meeting**

SPECIAL FIELD DAY ISSUE

CQ FO... CQ FO... CQ FO... DE W6ZE

**THE ORANGE COUNTY
AMATEUR RADIO CLUB,
INC.**

P.O. Box 3454, Tustin, CA 92781



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Monthly Events:

General Meeting:

Third Friday of the month
at 7:30 PM
American Red Cross
(near Tustin Ave & 4th St)
Santa Ana, CA

Club Breakfast:

First Saturday of the
month at 8:00 AM
IHOP
1001 E. 17th Street
(west of Lincoln)
Santa Ana, CA

Club Nets (Listen for W6ZE):

Wednesday Evenings
28.375± MHz SSB
7:30 PM - 8:30 PM
Bob AF6C, Net Control
146.55 MHz Simplex FM
8:30 PM - 9:30 PM
Bob, WB6IXN, Net Control

VISIT OUR WEB SITE

<http://www.w6ze.org>

for up-to-the-minute club information, the latest membership rosters, special activities, back issues of **RF**, links to ham-related sites, vendors and manufacturers, pictures of club events and much much more.

Club Dues:

Regular Members	...\$20
Family Members*	...\$10
Teenage Members	...\$10
Club Badge	...\$3

Dues run from January thru December & are prorated for new members.

*Additional members in the family of a regular member pay the family rate up to \$30 per family.

There is a \$1 charge if you'd like to have your badge mailed to you.

A Visit to Mr. Marconi's House

By Larry Hoffman, K6LDC

On a recent motor home journey to the New England States, I was fortunate enough to be able to visit a National Historic Site that each and every radio enthusiast should know about – the beach at South Wellfleet, Massachusetts. This is the famous point where the first wireless broadcast was sent from North America to Europe.

It started when Marconi was inspired by the demonstration of the existence of electric and electromagnetic waves by Heinrich Hertz. Nikola Tesla, a Serbian-American, proposed the essential elements of radio communication in 1892 and 1893. Marconi dreamed of a method of transmitting messages from transmitter to receiver without using wires for a path.

In 1894, Marconi went to his laboratory near Bologna, Italy, and began his experiments at the age of only 20. At first he used homemade equipment, and during the first winter he was able to transmit over a distance of 30 feet; by 1895 it was up to one mile. By utilizing ever increasing amounts of power he kept increasing the distance until he reached 200 miles in 1901.

The Europeans went crazy for wireless and were soon joined by the Americans. Telegraphy was usable and accepted. Marconi's dream became that of transatlantic wireless communication. To accomplish this

feat, he built stations in Poldhu, England, Glace bay, Nova Scotia, and South Wellfleet, Massachusetts.

He was using relatively long electromagnetic waves for his telegraphy. Because of the long electromagnetic waves used in spark mode, transmitters required very long antennas and extremely high power. Huge rings of masts (see photo) were installed to support the needed antennas. All three sets of masts were destroyed, before they could perform, by storms. Only the towers at Poldhu and South Wellfleet were rebuilt with 210 foot tall wooden towers.

Within each powerhouse, two kerosene-burning engines produced 2,200 volts and a Tesla transformer increased the voltage to 25,000 volts. This was the type of energy necessary to provide a long range electromagnetic wave. The receivers needed very high sensitivity.

On January 18, 1903 the transatlantic attempt was successful, and a message from President Theodore Roosevelt to King Edward VII was exchanged. The first two-way communication between Europe and the United States became a reality.

Within months, the South Wellfleet station was regularly sending American news through Poldhu to the London Times. In return a telegraph line connected Cape Cod's wireless station with the telegraph

office, and messages were relayed to the New York Times.

Ships at sea quickly adopted Marconi apparatus to receive news broadcasts, and that quickly developed into ship-to-shore operations. The effectiveness of the station was limited by atmospheric conditions. Transmissions usually took place between 10 P.M. and 2 A.M. because that was when atmospheric conditions were best.

Local residents were rather unenthusiased by the method of communication. The three-foot rotor, supplied with 30,000 watts of power, produced a crashing spark heard four miles downwind. Ships at sea were quite enthused with the new wireless communication and the enthusiasm became greater when the radio was used to effect sea rescues. The "Titanic" had a set-up, but the Coast Guard wouldn't send any helicopters (HI). The "Carpathia", the sister ship of the "Titanic", was one of the ships involved in the wireless-aided rescue of 700 people from the "Titanic" in 1912.

For 15 years the South Wellfleet spark-gap transmitter continued in commercial use. The operators sent and received their messages at 17 words per minute. The station call sign was "CC." Numerous factors spelled the demise of Station CC. The sea cliff it sat on was eroding away at a rate of three feet per

Please see **Marconi** on page 7



Tech Talk

by Bob, AF6C

RF Exposure Evaluation: (Part III)



Tech Talk

By Bob, AF6C

RF Exposure Part III

Last month we evaluated two antennas, a 5/8 wavelength two-meter ground plane and a tri-band beam. This month we'll discuss a few more issues concerning Minimum Personal Exposure (MPE) levels; then we'll evaluate a club member's HF multi-band vertical antenna.

Before we begin, let me again suggest, for those who haven't already done so, that you purchase the \$15 ARRL book *RF Exposure and You*, by Ed Hare, W1RFI [Clever call there Ed!] An alternative is to download the FCC document *OET Bulletin 65* along with Supplement 'B' *OET Bulletin 65 Amateur Supplement* from the FCC web site:

<http://www.fcc.gov/oet/info/documents/bulletins/#65>

The FCC Worksheet:

The two antenna evaluations last month were worked free form. To make your job easier the FCC and ARRL both publish an optional **worksheet** that will lead you step-by-step through an evaluation. The worksheet comes with eight pages of specific instructions and should be easy to complete if you've been following Tech Talk right along. The worksheet can be found in

Supplement 'B' *OET Bulletin 65 Amateur Supplement*, or starting on page 7.37 of the ARRL Book. The worksheet is four pages in length and is of the "fill in the blanks" type of format. The instructions cover each line quite thoroughly and give generic values for many entries should you not be sure of what to enter. The instructions include tables to save you from some of the more difficult calculations. You should fill out a separate worksheet for each antenna and band.

When you're finished filling out the worksheets, sign and place them in a safe place (with your logbook possibly.) They make a good record of your compliance should the FCC come knocking at your door. You can bet that if you attract the FCC's attention enough to have them visit you, they will check that you are in compliance with the Exposure rules.

What If You Are Not In Compliance?

You've completed a preliminary evaluation and it shows that your antenna field exceeds the MPE; what can you do? If you have not yet taken into account the emission type factor and transmit duty cycle, do so now. These concepts were covered in earlier columns but are repeated here. The worksheet allows you to include these factors.

Emission Type Duty Factor:

Since different types of modulation have different average to PEP power levels, certain modes such as SSB can reduce exposure distances significantly. For instance, if you're using SSB with 1500W of PEP power (and no speech processing) the average power you're using is just 20% times 1500 watts or 300 watts. You can use this power level and repeat your calculations. BUT BE CAREFUL – if you're using the full legal limit then you are probably chasing DX or trying to get through during bad conditions. This means you will probably have the speech processor on. When it is on, the average to PEP power is now in

the 40% to 50% range, and you MUST USE 600 to 750 watts for your calculations. Also, tuning up with full carrier will exceed MPE levels. A table showing the ratio of PEP to average power was given last month in this column. The ARRL book and FCC document have more extensive tables. Remember that the emission type factor for FM is 100%.

Transmit Duty Cycle:

Unless you're from the "Dark Side" of amateur radio, you don't transmit continuously. You can use this fact to average the exposure level over either a 30 minute period (uncontrolled areas) or a 6 minute period (controlled areas). You must remember to use the maximum on time when calculating the duty cycle. If you repeatedly transmit for two minutes then listen for two minutes the average in a controlled area is 67% (not 50% nor 33%) since for a given six-minute period you can be transmitting for four minutes and receiving for only two. The same duty cycle would result in a 53% duty factor in an uncontrolled area (sixteen minutes transmitting and fourteen minutes receiving.)

If, after all this you are still over the MPE, there are certain additional actions you can take. The most obvious are to raise or move the antenna, or to reduce power. In the case of controlled areas you can also show that you have taken precautions to assure that no one is in that area when you are operating your station. If the field level is exceeded in an uncontrolled area where human presence is normally transient or not expected, such as a roadway or sidewalk or shrubbery, this can justify that the MPE would not normally be exceeded when people pass such areas. It would be a good idea to be able to view these areas while operating. The posting of signs in areas of transient human exposure warning people not to linger in the area is also acceptable. However, this

might not be a good idea as it could cause more problems than it solves. The worksheet covers such possibilities.

What are the Exposure Limits?

So far the actual minimum exposure level has not been quantitatively defined in Tech Talk. As a rule of thumb the uncontrolled area limit is five times higher than the controlled area limit, though this is not case below 3 MHz. The exposure limit varies with frequency. Currently, only frequencies between 300 KHz and 100 GHz have a defined MPE. Table one shows the current MPE levels for controlled and uncontrolled areas at the high end of the major HF amateur bands. Below 30 MHz the power density is separated into its two components (the electrical field strength - E and the magnetic field strength - H). Each component varies inversely with the frequency and thus the power density - S varies inversely with the square of the frequency. Between 30 and 300 MHz the MPE is fixed at 1.0 mW/cm² (controlled) and 0.2 mW/cm² (uncontrolled). Between 300 MHz and 1.5 GHz the MPE power density varies directly with the frequency. Above 1.5 GHz to 100 GHz the controlled and uncontrolled MPE levels are again fixed at 5.0 and 1.0 mW/cm².

If you wish to calculate the MPE for particular frequencies between 1.34 MHz and 30 MHz or 300 MHz to 1.5 GHz see the side bar titled MPE Field Equations on page 6.

The R6000 Cushcraft Vertical:

Let's look at a Cushcraft R6000 (6 through 20 meters) vertical with a claimed gain of 3 dBi. The Yaesu FT757 radio runs 100 watts output (no 6-meters) and there is 100' of RG-8X feeding the antenna. The antenna is mounted along the side of the house between the ham's house and side fence that separates the neighbor's property. The antenna is mounted with its base

10 feet above ground. The distance to the house is 8 _ feet. The fence is five feet away. Shrubbery, about 5 feet deep, runs along the fence on the neighbor's side in the area of the antenna. The neighbor's house is 12 feet distant from the fence and the second story is back even further. Both houses are two story wood frame dwellings.

From table one in the ARRL book, the two dimensional safe distances for 100W key down (100% duty cycle) are:

Band (Meters)	Uncontrolled (Feet)	Controlled (Feet)
6	14.8	6.6
10	14.6	6.5
12	12.3	5.5
15	10.6	4.7
17	9.0	4.0
20	7.1	3.2

This antenna, using the simple, highly conservative table, is in compliance with the controlled MPE limits. The uncontrolled levels are another story. Even though the power level on 15 through 20 meters is below the minimum required for an evaluation, since the antenna is so close to uncontrolled space, the amateur is responsible for assuring that the MPE is not exceeded. In this simple evaluation it is on all bands (at 100% key down). If it wasn't, we could stop right here.

Taking the evaluation one step further, table two in the ARRL book has an explicit chart for this type of

antenna. Here is the data from that table for 100 Watts at different uncontrolled exposure heights above ground, assuming the antenna base is at 10 feet:

Band (Meters)	Exposure Height		
	At 6' (Feet)	At 12' (Feet)	At 20' (Feet)
6	0	8.0	6.0
10	0	6.5	8.5
12	0	6.0	7.5
15	0	5.5	6.5
17	0	5.0	5.0
20	0	4.5	3.5

It is immediately obvious that someone walking on the ground is below the MPE level on all bands. Since the neighboring house is about 12' back from the fence and since the second story is back even further, the house is beyond the area of exposure. This radio is safe to operate as long as no one is climbing above the shrubs near the fence.

While some liberties have been taken in this evaluation, it is very conservative. The duty factor of the modes used, time averaging over a 30 minute period and feedline loss (2.0 dB or 37% at 30 MHz), none of which were considered, will further reduce the minimum controlled safe distances substantially.

This ends the series on RF Exposure and the new FCC requirements. Next month we'll start a new topic. Perhaps coax and coax connectors. *-RF-*

Band ^A Meters	Controlled / Uncontrolled			Avg. Time ^C Minutes
	E Field V/m	H Field A/m	S Field ^B mW/cm ²	
80	460.5 / 206.0	1.22 / 0.55	56.3 / 11.3	6 / 30
40	252.3 / 112.9	0.67 / 0.30	16.9 / 3.39	6 / 30
20	128.4 / 57.42	0.34 / 0.15	4.37 / 0.87	6 / 30
15	85.87 / 38.42	0.23 / 0.10	1.96 / 0.39	6 / 30
12	73.71 / 32.97	0.20 / 0.09	1.44 / 0.29	6 / 30
10	62.02 / 27.74	0.17 / 0.07	1.02 / 0.20	6 / 30

A: Upper band limit frequency is used for calculation
 B: Equivalent plane-wave power density (far field)
 C: Averaging period for MPE

Table One: MPE Levels For HF Ham Bands

Side Bar:

MPE Field Equations:

Between 3.0 MHz (1.34 MHz uncontrolled) and 30 MHz, as well as between 300 MHz and 1.5 GHz the MPE levels vary with frequency (f in MHz). If you want to calculate the E or H or S fields in these regions you can use the following simple equations:

Controlled Exposure:

(3.0 MHz < f < 30 MHz)

$$E (V/m) = 1842 / f$$

$$H (A/m) = 4.89 / f$$

$$S (mW/cm^2) = 900 / f^2$$

Controlled Exposure:

(300 MHz < f < 1.5 GHz)

$$S (mW/cm^2) = f / 300$$

Uncontrolled Exposure:

(1.34 MHz < f < 30 MHz)

$$E (V/m) = 824 / f$$

$$H (A/m) = 2.19 / f$$

$$S (mW/cm^2) = 180 / f^2$$

Uncontrolled Exposure:

(300 MHz < f < 1.5 GHz)

$$S (mW/cm^2) = f / 1500$$

Alinco - from Page 1 marketplace" and that all Alinco warranties "will remain in force and continue to be honored through their term." Alinco will exhibit at Dayton Hamvention next week and will sponsor the W8BI special event station in the outdoor exhibits area as it has in past years.

In addition to dealer distribution, the Atoc facility in Ohio is taking over customer support and out-of-warranty service of Alinco products and sales of Alinco parts. Parts sales have been temporarily suspended during the changeover, and service could be disrupted for a time as well.

The announcement said Alinco will concentrate on designing and manufacturing products from its Japan headquarters in Osaka and factory in Toyama.

For more information, visit the

Alinco Web site:

<http://www.alinco.com>

or contact Atoc Distributing LLC, 23 S High St, Covington, OH 45318 Phone: 937-473-2840.

Tnx - Lowell, KQ6JD

Field Day Report:

On the morning of June 23rd Hams from the OCARC started converging on Portola Park in Santa Ana. Towers and antennas were laid out, assembled and erected. A generator was set up, and power cables were strung about. Coffee was drunk and donuts were downed. It was the beginning of another ARRL Field Day.

The 40-meter station chose a location close to the park walkway and soon had an EZ-UP canopy and a tent shelter set up. Larrys - K6VDP and KR6LO quickly got the station up and running on CW, much to the delight of those passing by. Seeing that old and most reliable mode of communications in operation attracted a lot of interest. Bob - KD6BWH (team captain), Tim - K6GEP and Jim - KE6UCH helped man the station and accumulated numerous SSB contacts.

At the edge of the park was the 20-meter station located in Larry - K6LDC's new motor home. Just outside, Chris - KJ6ZH set up a satellite station and quickly made the first of three FD satellite contacts for W6ZE. Larry (team captain) and Chris also burned the ether on 20-meters with the help of Dick - W6RWY and Lowell - KQ6JD.

Nearby was Bob - KD6XO's motor home with its 15-meter station. This year's star OP on 15 was Cory, KE6WIU, who averaged more than 100 contacts per hour over numerous 20-minute periods. Her melodious voice raised the testosterone level on 15 as numerous sta-

tions piled on for a contact. Swallowing their pride and helping her were Bobs - KD6XO and AF6C (team captain), Ken - W6HHC (Field Day chairman), and Paul - WD6FMX.

The 10-meter station, in Bruce - KC6DLA's grand motor home fought the band conditions and scrapped for a good score. Operators included Bruce, Tom - WA6PFA (team captain), Roy - W5RT, and Bud - WA6VPP. Outside of the station was Tom's "Blue Room" that acted as a visitor center where demonstrations of ATV, APRS and Packet were running.

Chris - KF6LEX set up his solar array along the walk near 40-meters, and operating from a park bench supplied most our VHF and 75-meter contacts.

Helping in the setup, support and tear down were Bob - WB6IXN and his brother Lee, Matt - K6LNX, John - W6JOR and Art - KE6WOX. Stakes needed pounding and, guys needed tying.

Field Day wouldn't have been a success without food. Credit goes to Don - KC6ONZ and his daughter and helper April - KG6CJI. His culinary delights (steak sandwiches, spaghetti, and Chinese for dinner) received a 9 of 10 (If only the club had found a way to keep the food warm longer!). Don managed all this while on a full workday schedule.

Late in the evening a somber moment occurred as members gathered to toast our departed, but not forgotten, friend Kei - W6NGO with a sip of sake. Kei was the motivator behind many years of successful Field Day events for W6ZE.

A special thanks goes to Ken - W6HHC for his tremendous planning as the FD chairman!!!

A collage of FD pictures and the raw scores from years past start on page 8.

Minutes of the July 2001 Breakfast Board Meeting:

The OCARC Board Meeting was called to order at 8:41 AM following the club breakfast, attended by ten souls. All board members were present, except Chris - KJ6ZH (Publicity) and Larry - K6LDC (MAL).

Treasurer's Report:

The Treasurer Ken - W6HHC reported the current balance at \$1,995.27 including two additional dollars that Tom turned in from the monthly raffle. It was reported that the special raffle income is coming in very slowly. Currently \$29 has been received.

Secretary's Report:

The Secretary Bob - AF6C reported no correspondence. He will write a letter of thank you to Santa Ana for the use of Portola Park for Field Day.

Membership's Report:

The Membership Chairman Dick - W6RWY reported the current membership at 53.

VP's Report:

The Vice President Cory - KE6WIU gave a list of planned programs. September and November are still open. Ken - W6HHC will talk on Fuel Cells in July, ARRL SWD Vice Director Art - W6XD will talk in August. October is the club auction and December is the Christmas Dinner meeting.

VP Cory will also plan the Christmas dinner. We will try for Mimi's again in Fountain Valley or Santa Ana.

Old / New Business:

Bob KD6XO asked about Mr. RF. We had planned to start it again earlier this year to promote camaraderie among members and guests. Mr. RF will start at the July meeting.

The Board Members present unanimously voted Field Day a success. A discussion was held on how we can improve for next year. We need to get more people operating and more CW. Multiple transmitters on some bands was proposed. The required filtering was discussed.

The club will support the OCARRO

Orange County Fair booth on Wednesday July 18th. See Bob - KD6BWH if you're interested in participating. Space is filling fast. This year's theme is **Twist and Shout**.

Ken - W6HHC, our ARRL Assistant Director, has been receiving a list of new hams and new ARRL members in the area. The club recommends that an issue of RF be sent to each person listed to introduce them to our club. Ken will supply the list each month to Dick - W6RWY for the mailing.

The meeting adjourned at 9:24 AM.

- Submitted by Bob - AF6C

How MR. RF Works:

Mr. RF is an idea to promote guests and members meeting and getting to know each other better.

Mr. RF is appointed by the Membership Chairman before each club meeting. His identity is kept secret. He could be a member or guest who is planning to attend.

The Membership Chairman also sets greeting criteria for each meeting and tells it to Mr. RF to determine how to pick a winner. A criterion could be the third person to shake his hand; the first person to say hello; or something similar.

Mr. RF then attends the meeting and when (and if) one of the other attendees greets Mr. RF in a manner that meets the criteria, that attendee is the winner. Nothing is said at the time, however, so the greetings will continue.

Later in the meeting the identity of MR. RF is revealed, and Mr. RF announces what the criteria are and who the winner is. The winner receives additional raffle tickets.

The success of the Mr. RF idea is in selecting the criteria. Anything that promotes members and guests feeling welcome at the meeting is acceptable.

Mr. RF has been with the club for many years. Let's keep it alive!

Marconi - from Page 3

year. The erosion threatened collapse of the eastern-most towers. The Navy eventually closed the station because of their concern for national security and being able to censor the news during WWI. At this stage the closing was inevitable. Technological advances made spark-gap obsolete. The site was abandoned and was scrapped in 1920. The station license was moved to Chatham, Mass and the call letters were changed to "WCC." It is still the most heavily used ship-to-shore radio station on the East Coast.

Note: Marconi's basic patents were declared invalid because of the earlier work of Nikola Tesla.



Photos:

Above is a photo of Marconi's station operating point. The photos on page three are of the Cape Cod Lighthouse - near Marconi's Massachusetts site and a model of one of the "Antenna Farms" used as part of the first transatlantic radio transmission.

Photos by K6LDC



Are you going to greet and shake hands with the mysterious Mr. RF? You could be the winner of extra raffle tickets! Don't miss the July meeting!



**OCARC
Field Day
2001**

PORTOLA PARK

"RF"

ORANGE COUNTY AMATEUR RADIO CLUB

JULY 2001

FIELD DAY SUMMARY
FOR
THE ORANGE COUNTY AMATEUR RADIO CLUB - W6ZE

by: Ken / W6HHC & Bob / AF6C

YEAR	160M	80M	75M	40M	40M	20M	20M	17M	15M	15M	12M	10M	10M	6M	2M	2M	2M	220	-- 440 --	SAT-	NOVICE				---- TOTAL ----	
	SSB	CW	SSB	CW	SSB	CW	SSB	SSB	CW	SSB	SSB	CW	SSB	PHN	CW	PHN	PKT	PHN	PHN	ATV	ELLITE	80	40	15	10	QSO's / (POINTS)
2001	0	0	25	101	251	0	432	0	0	675	0	0	109	48	0	28	0	1	0	0	3	0	0	0	0	1,673 / 3,548
2000	0	19	20	88	91	0	625	0	0	794	0	0	121	36	0	72	0	7	15	0	1	0	0	0	0	1,889 / 3,992
1999	0	13	20	15	237	0	996	0	0	724	0	0	13	5	0	2	0	0	0	0	0	0	0	0	9	2,034 / 4,124
1998	0	24	75	65	136	100	250	0	0	624	0	0	82	0	0	46	7	17	12	0	1	0	0	0	0	1,439 / 3,270
1997	5	81	131	83	306	150	853	0	14	275	0	0	106	32	0	79	32	4	0	0	1	0	0	0	0	2,152 / 5,024
1996	-	146	228	104	125	283	673	0	40	605	0	0	217	121	0	32	13	0	40	0	1	0	0	0	0	2,628 / 6,428
1995	-	145	272	203	94	443	572	0	51	451	0	0	131	66	0	93	33	29	8	0	6	0	0	0	0	2,597 / 6,944
1994	-	114	114	208	45	486	748	0	85	761	0	13	312	58	0	94	31	33	0	0	0	0	0	0	0	3,102 / 8,078
1993	-	150	100	159	81	530	700	30	131	812	0	0	179	40	0	86	35	12	16	0	0	0	0	0	0	3,061 / 8,132
1992	-	0	294	200	110	541	555	0	0	840	0	0	232	13	0	74	41	0	1	2	80	0	0	0	0	2,983 / 7,530
1991	-	105	308	182	182	400	623	23	9	463	0	0	104	4	0	141	48	23	11	0	0	0	0	0	0	2,626 / 6,740
1990	-	0	0	70	144	0	370	-	0	747	0	0	131	39	0	114	2	14	26	0	-	0	0	0	0	1,657 / 3,454
1989	-	30	0	98	5	0	906	-	21	172	0	0	238	3	0	121	18	24	9	1	-	0	0	0	0	1,646 / 3,590
1988	-	127	0	66	75	2	359	-	0	570	0	0	81	0	0	32	14	0	-	-	-	0	27	0	144	1,497 / 3,726
1987	-	22	0	0	39	0	708	-	0	18	1	0	0	1	0	51	5	0	-	-	-	0	0	0	117	962 / 2,202
1986	-	0	46	219	78	0	488	-	0	45	10	0	0	0	0	82	0	0	-	-	-	0	0	0	0	968 / 2,374
1985	-	81	0	311	91	35	662	-	75	0	-	0	0	0	0	22	-	0	-	-	-	4	4	3	0	1,288 / 3,602
1984	-	0	0	310	0	32	196	-	0	350	-	0	0	0	0	0	-	0	-	-	-	18	3	32	0	941 / 2,672
1983	-	3	93	200	0	0	776	-	0	995	-	0	43	18	0	16	-	1	-	-	-	0	0	0	0	2,145 / 4,696
1982	-	0	105	49	238	40	352	-	0	515	-	0	72	0	0	155	-	27	-	-	-	0	10	19	0	1,582 / 3,400
1981	-	0	167	200	265	60	699	-	77	717	-	0	105	0	0	197	-	0	-	-	-	0	0	0	0	2,487 / 5,648
1980	-	20	149	205	235	471	318	-	52	1,025	-	0	226	12	0	100	-	36	-	-	-	0	0	0	0	2,849 / 7,194
1979	-	0	195	198	92	42	773	-	0	737	-	0	95	0	2	124	-	8	-	-	-	0	0	0	0	2,266 / 5,016
1978	-	14	196	242	170	30	981	-	50	558	-	0	145	0	1	164	-	23	-	-	-	2	4	7	13	2,600 / 5,926
1977	-	25	243	163	199	0	843	-	47	486	-	0	309	0	4	234	-	0	-	-	-	0	19	34	4	2,610 / 5,812
1976	-	99	254	152	487	21	600	-	64	210	-	2	54	0	0	2	-	0	-	-	-	0	0	0	0	1,945 / 4,566
1975	-	80	120	154	274	40	863	-	140	259	-	0	123	0	0	0	-	0	-	-	-	0	0	0	0	2,053 / 4,934
1974	-	0	161	0	333	0	630	-	0	342	-	0	110	0	0	0	-	0	-	-	-	6	6	12	0	1,600 / 3,248
1973	-	90	226	0	452	0	932	-	0	273	-	0	0	0	0	46	-	0	-	-	-	0	0	0	0	2,019 / 4,218
1972	-	0	50	0	350	0	521	-	0	530	-	0	0	0	0	94	-	0	-	-	-	0	0	0	0	1,545 / 3,090
1971	-	0	274	0	106	0	530	-	0	136	-	0	0	0	0	0	-	0	-	-	-	0	0	0	0	1,046 / 2,092
1970	-	0	272	0	0	0	531	-	0	426	-	0	0	0	0	0	-	0	-	-	-	0	0	0	0	1,229 / 2,458
1969	-	0	98	0	50	0	375	-	0	301	-	0	0	0	0	169	-	0	-	-	-	0	0	0	0	993 / 1,986
1968	-	10	224	62	396	93	328	-	24	430	-	0	68	0	0	145	-	0	-	-	-	0	0	0	0	1,780 / 3,938

Note: These are raw contacts taken directly from the log sheets. Adjustments have not been made for duplicate contacts, and bonus points have not been added yet. Final scores appear in QST in the fall.

**Minutes of the June 2001
General Meeting:**

The June meeting of the Orange County Amateur Radio Club was called to order at 7:33 PM by Cory - KE6WIU. The program was by our Treasurer Ken - W6HHC who showed images of our previous five Field Day events. This was a high-tech presentation with digital pictures instead of slides as in years past. The Field Day program was followed by a Field Day planning session. Field Day is one week after the meeting. Ken reported that the FD location is all set, and that we will start setting up at 7:30. If you arrive earlier, quiet is essential.

Eighteen people attended the meeting including one visitor, Barry - AD6WD, who became our newest member. The low attendance was attributed to a conflict with the Laker final playoff basketball game.

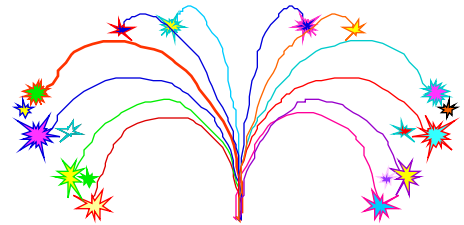
A short business meeting was held after the break. All board members

were present except the President (out of town on business), Publicity chairman - KQ6JD (working) and MAL - KD6XO who had to leave before the business meeting began.

The Treasurer reported our current balance at \$2,109 and change. Large future payments still pending are Field Day expenses and the insurance renewal. Ken also passed around the hat for some extra Field Day cash. \$57.56 was collected.

Secretary Bob - AF6C reported no new correspondence was received. He also reported that the Field Day letter to neighbors bordering on Portola park was sent out during the first week of June.

Under old business a discussion of the raffle was continued from the board meeting. Larry - K6LDC made a motion to keep the ticket quantities the same and not limit the number of prizes. The only change is that the grand prize ticket drawing will be held first. The ticket will not be revealed, but held until the other prizes are drawn. The grand prize winner will



then be announced. The motion was seconded by Lowell - KQ6JD. The motion was passed.

The meeting was adjourned at 2117 hours, and the raffle held. Our VP Cory - KE6WIU was the first grand prize winner under the new rules. (A self adjusting WWVB receiver clock.)

- Submitted by Bob - AF6C



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