



RF



ORANGE COUNTY AMATEUR RADIO CLUB, INC.

VOL. XLIII NO. 1

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

JANUARY 2002

The Prez Sez:

By Cory KE6WIU

Greetings All!

Firstly, I would like to wish everyone and their families a happy and prosperous 2002. Also, I would like to thank our past President and board for an excellent year; we all appreciated their guidance, direction, time and efforts. As our sights turn upon the coming year I hope I can fill the "size twelves" I've been left to fill. It is my observation that our club has been one of the fortunate few to have remained solvent with increased membership and to have maintained an overall interest in the art of Amateur Radio. It is my goal to continue in the footsteps of my predecessors and to nurture the Club in a positive direction.

This coming year, with the grace of the board, I would like to see some old club traditions revived as well as maybe start a few of our own.

It is my belief that the strong traditions of our club i.e. the "not-so-DX-peditions", B2V, field day, etc... form the foundation that our club is built on. However, it is because of the expertise from within that we are able to continue.

At this time I would like to thank all those who have advised me, given me direction over the years, and have shown their confidence in me by electing me their President.

Sincerely,
Cory, KE6WIU

December Meeting Minutes:

The Orange County Amateur Radio Club held its annual Christmas dinner on Sunday December 16th at Mimi's Café in Fountain Valley. Thirty-four people attended the event and shared good food and company. Once again Mimi's provided an enjoyable atmosphere and good service.

Bob Buss - KD6BWH, as outgoing Pres, acted as emcee and introduced the new Board of Directors:

President:	Cory Terando	KE6WIU
Vice Pres:	Lowell Burnett	KQ6JD
Secretary:	Matt McKenzie	K6LNK
Treasurer:	Al Toering	N6TEZ
Activities:	Phil Andersen	N7PA
Membership:	Chris Winter	W6KFW
Publicity:	Frank Smith	WA6VKZ
Technical:	Larry Beilin	K6VDP
Members-at-Large:	Bob Buss	KD6BWH
	Larry Hoffman	K6LDC

- see Dec Minutes cont'd on Pg 7 --

JANUARY MEETING IS

Ham Radio and LINUX

What is Linux? What can it do for Hams? Will it break my computer, or make it go faster? Do I have to spend a long time learning ancient command line incantations, or does it have a graphical environment like Windows/Mac?

All these questions and more will be answered in a presentation by Matt McKenzie - K6LNK (Yes, the vanity call sign stands for LiNuX :->) at the January OCARC meeting.

Don't miss it. All members and visitors are welcome.

The next regular meeting will be:

Friday, Jan 18th 2002
@ 7:30 PM

We will be meeting in **Room 208** in the east **Red Cross Bldg.**

In This Issue: Page

The PREZ SEZ1
Dec. Meeting Minutes1
JAN. Meeting – Linux & Hams...	...1
CLUB INFORMATION2
History of OCARC Presidents	...3
Jan. Board Minutes3
2001 Financial Report4
Tech Talk - Digital Comm5
WHO is the PREZ? 7
W6ZE NET CHECK-INS7

**THE ORANGE COUNTY
AMATEUR RADIO CLUB,
INC.
P.O. Box 3454, Tustin, CA 92781**



2002 Board of Directors:

President:

Cory Terando, KE6WIU
(714) 894-3817
corymuzk@yahoo.com

Vice President:

Lowell Burnett, KQ6JD
(714) 997-0999
LBur729028@aol.com

Secretary:

Matt McKenzie, K6LNx
(714) 546-2228
k6lnx@qsl.net

Treasurer:

Al Toering, N6TEZ
(714) 667-2768
n6tez@arrl.net

Membership:

Chris Winter, W6KFW
(714) 543-6943
cwinter727@aol.com

Activities:

Phil Andersen, N7PA
(949) 492-1900
n7pa@arrl.net

Publicity:

Frank Smith, WA6VKZ
(909) 763-0907
wa6vkz@msn.com

Technical:

Larry Beilin, K6VDP
(714) 557-7217
k6vdp@aol.com

Members At Large:

Larry Hoffman, K6LDC
(714) 636-4345
k6ldc@earthlink.net

Bob Buss, KD6BWH
(714) 534-2995
kd6bwh@aol.com

2002 Club Appointments:

W6ZE Club License Trustee:

Bob Eckweiler, AF6C
(714) 639-5074
af6c@arrl.net

Club Historian:

Bob Evans, WB6IXN
(714) 543-9111
bobev@netzero.net

RF Editor:

Ken Konechy, W6HHC
(714) 744-0217
kkonechy@pacbell.net

WEB Master:

Ken Konechy, W6HHC
(714) 744-0217
kkonechy@pacbell.net

ARRL Assistant Director:

Ken Konechy, W6HHC
(714) 744-0217
kkonechy@pacbell.net

ARRL Awards Appointees:

Larry Beilin, K6VDP
(714) 557-7217
k6vdp@aol.com

Art Dillon, KE6WOX
(714) 997-2078

OCCARO Delegate:

Bob Buss, KD6BWH
(714) 534-2995
kd6bwh@aol.com

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
CowGirl's Cafe, Too
2610 S. Harbor Blvd
(just south of Warner)
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 Dec
and 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 HISTORY of OCARC PRESIDENTS

by

Ken - W6HHC

with great assistance from our Club Historian, Bob - WB6IXN

YEAR					
2002	KE6WIU	Cory Terando	1975	WA6LHB	Art Sheldon (call now K7ZE)
2001	KD6BWH	Bob Buss	1974	W6HHC	Ken Konechy
2000	K6LDC	Larry Hoffman	1973	WB6QNU	Bob Eckweiler (call now AF6C)
1999	WA6VPP	Bud Barkhurst	1972	WA6FIT	Ron Cade (call now W6ZQ)
1998	KD6BWH	Bob Buss	1971	WB6CQR	Billy Hall (call now N6EDY)
1997	WA6VKZ	Frank Smith	1970	WB6UDC	Jack Hollander (call now N6UC)
1996	AF6C	Bob Eckweiler			
1995	N6XTJ	Jim Roberts			
1994	KJ6ZH	Chris Breller	1969	WA6ROF	Jerry VerDuft (call now ADØA)
1993	KC6TAM	Jane Breller	1968	W6COJ	Dave Hollander
1992	WA6VKZ	Frank Smith	1967	WB6GPK	Jim Hill
1991	W6HHC	Ken Konechy	1966	WA6YWN	Jack Shaw
1990	KJ6ZH	Chris Breller	1965	K6KTX	Rolland Miller
1989	WA6VKZ	Frank Smith	1964	W6WRJ	Ralph Alex Alexander (call now W6RE)
1988	W6HHC	Ken Konechy	1963	W6DEY	Roy Maxson
1987	N6JSV	Jim Talcott	1962	K6LJA	Ted Glick
1986	WA6VKZ	Frank Smith	1961	K6IQ	Roy Morriss
1985	AF6C	Bob Eckweiler	1960	K6TXS	Charles (Ed) Edwards
1984	KA6IMP	Chris Breller (call now KJ6ZH)	1959	W6BVI	Ken Kesel
1983	W6IBR	Al Watts	1958	W6BVI	Ken Kesel
1982	KA6HNY	Robin Hoff	1957	- CLUB DISBANDED!!	
1981	WA6VKZ	Frank Smith	1956	W6HIL	Bob Swenson
1980	WA6FOW	Ernie Prichard	1955	W6BVI	Ken Kesel
1979	WB6IHZ	Terry Mathers			
1978	WA6LFF	Jim Kingsbury			
1977	WA6WZO	Fried Heyn			
1976	WB6PEX	Martin Raymond			
			1954	W6UPP	Marinus Conway
			1953		Probably only informal meetings, no officers?
			1952	W6QZQ	Horace Bates
			1951	W6LDJ	Sam (Mac) McNeal
			1950		Probably only informal meetings, no officers?
			1949	W6CGF	Chuck Lunder
			1948	W6BWO	Dale Bose
			1947	W6ALO	Tommy Gentges
			1946	W6DEY	Roy Maxson
			1945	W6DEY	Roy Maxson
			1944	- ALL OFF TO WAR!!	
			1943	- ALL OFF TO WAR!!	
			1942	W6IBN	Roy Cumpston
			1941	W6BAM	Shelley Trotter
			1940	W6KLU	Harold Christensen
			1939		Probably only informal meetings, no officers?
			1938	W6NSA	Les Gates
			1938	W6ADT	Noral Evans
			1937	W6LYN	Noral Evans (Also reissued W6ADT)
			1936	W6LYN	Noral Evans (Also reissued W6ADT)
			1935	- CLUB DISBANDED!!	
			1934	W6IGO	Earl Moore
			1933	W6IGO	Earl Moore

OCARC Minutes of the Board Meeting January 5th 2002

The January Board meeting was held after the club breakfast on January 5th. The meeting was called to order at 8:41 AM. There were 16 members present, with 7 board members in attendance.

Board members present were:
President Cory- KE6WIU,
VP Lowell-KG6JD, Secretary Matt-
K6LNK, Treasurer Al- N6TEZ,
Membership Chris- W6KFW,
Member-at-Large Larry- K6LDC, and
Technical Larry-K6VDP.

No correspondence from Secretary
Matt - K6LNK. Secretary Matt-
K6LNK and Treasurer Al- N6TEZ

were given the keys for the OCARC
P.O. Box.

Treasurer's report:

The 2001 Audit was successful. Preparations for change over are complete, and all materials transferred to new 2002 treasurer, including going to the bank after the meeting with 2002 President,

- see **Board Minutes** cont'd on Pg 8 -

Tech Talk #13 An Introduction to Digital Communications

By Ken Konechy W6HHC

(This is the first part of a Tech Talk series to overview the field of Digital Communications.)

This introduction starts out like good story for a long winter night..... once upon a time (last summer) I took an on-line class over the Internet from UCI on CDMA Digital Communications. Where CDMA (Code Division - Multiple Access) is the communications technology that is used in modern cell phones. Now, I have been a HAM for over 40 years....and I thought I knew a lot about RF Communications (I'll call it old-fashioned "analog" communications). Well this course "blew my socks off"!!

I couldn't believe all the accomplishments that can be achieved if you use digital communications theory and digital techniques!!! **For example: you can place 50 stations on the same frequency (25 pairs of CDMA communicating stations) and they will NOT significantly interfere with each other!**

I can clearly see how digital communications will become more important to Ham Radio in the future. (Note: see page 28 of the January 2002 issue of QST for another introduction to Digital Voice Communications.)

The DigiComm Concepts

First, let me list some of the main building blocks of Digital communications so you get a feeling on what we will cover over the entire series. And then I will cover them month-by-month in the Technical Talk Series.

1) 1's and 0's

Digital communications differs from your old "analog" RF communica

tions in that you are not sending mono tones (Morse Code) nor are you sending speech tones over the RF. What is transmitted is a series of 1's and 0's. A stream of 1's and 0's is called digital information or digital communications.

2) Analog-to-Digital Conversion

When you speak into a mike, your output is analog voltage. So, right away we need to have circuitry to convert analog signals into digital signals (a stream of 1's and 0's).

3) Voice Compression

I will talk about this more in a later article in the series, but when you convert voice into 1's and 0's it becomes a bandwidth-hog. Voice compression was invented to reduce human voice back to a reasonable bandwidth.

4) Multiple Access Techniques

There are several different techniques to share frequencies with many stations. Later in this first article I will describe 3 different Multiple Access technologies including Spread Spectrum.

5) Signal-to-Noise Improvements

There are two basic approaches to increasing the number of stations on the same frequency. This approach deals with improving the signal to noise ratio. Later in the series I'll explain how Shannon's Theorem is a handy way to deal with tradeoffs.

6) ORTHOGONAL Signals.

This is the other basic approach to increasing the number of signals on the same frequency. Two (or more) orthogonal signals don't interfere with each very much. I will talk about code division using WALSH NUMBERS and PSUEDO-RANDOM NUMBERS to make signals orthogonal to each other. This is the "Code Division" part of CDMA. Code division acts like a digital filter. It involves a lot of math, but I think I can explain the concepts in a simple way.

7) Dealing with Fading Propagation

Cell phones run low power and have to work in a terrible environment. They have to deal with multiple signals bouncing off buildings and also when a car moves--the motion changes the phase of the received signal. I'll describe the techniques used by cell phones.

8) Digital Receivers

Well, if a transmitter is not transmitting analog any more, then you can not tune in sidebands in order to recover streams of 1's and 0's. Digital transmitters and digital receivers are designed to work with modulation technologies like FSK (Frequency Shift Keying), PSK (Phase Shift keying), and QPSK (Quad Phase Shift Keying). Just like your modem or Packet-Radio TNC.

Multiple Access Techniques

In the remainder of this Tech Talk article, I'll describe three different multiple-access technologies:

- (a) **FDMA** (Freq Division - Multiple Access)
- (b) **TDMA** (Time Division - Multiple Access),
- (c) **CDMA** (Code Division - Multiple Access)

(a) Freq Division - Multiple Access

FDMA was the first approach tried in old cell phones (known today as analog cell phone technology and sometimes called G1 cell phones for Generation One).

The basic concept of FDMA is to use different frequencies for different stations to avoid adjacent interference. Figure 1 on page 6 shows a "cell" layout for cell phone FDMA operation.

-- see Tech Talk cont'd on Pg 6 --

Tech Talk #13
An Introduction to
Digital Communications
 -cont'd from Page 5

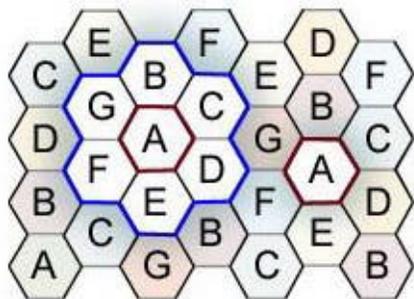


Figure 1 - The Frequency "re-use" pattern used in FDMA.

The concept is that you assign a different FREQUENCY to each station operating in a physical "cell". Each frequency is assigned a different letter in Fig 1. You can see how the nearest other station using Freq 'A' (the one on the right) is located several miles away from the Freq 'A' station on the left and therefore its signal strength is much weaker than the station transmitting on Freq A cell on the left. Any Freq 'B' or Freq 'C' (etc) station will not interfere with stations on Freq 'A'. FDMA is designed to work with "line-of-sight" communications and not with ionosphere propagation type of signals.

In a way, this is somewhat like how Hams operate on 2 Meters. When stations that are close to each other are on the same frequency, they interfere. Two stations won't interfere if (1) they are close, but on different frequencies or (2) they are on the same frequency, but are not close to each other.

Figure 2 looks at the three dimensions of Multiple Access for FDMA technology. These three dimensions are Frequency, Time, and Power-level.

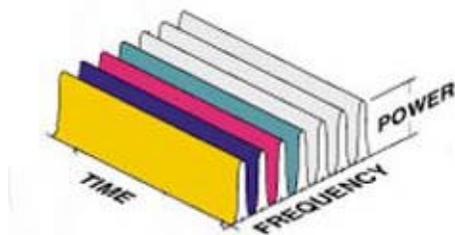


Figure 2 - The Three Dimensions of FDMA

In Fig 2, the gold color can be thought of as one unique frequency, perhaps Freq 'A'. The blue can be a second unique frequency like Freq 'B', etc.

As it turns out, FDMA technology has the least amount of efficiency for sharing frequency spectrum (that is: the most amount of interference). In addition it is very difficult to move "cell frequencies" around since they have "adjacency rules" that can not be violated.

(b) Time Division - Multiple Access

TDMA technology evolved from FDMA and was used in the next generation of cell phones, called G2. The basic concept of TDMA is that several users share the same frequency channel at different times. Essentially three users take turns using the channel in time-slots that are about 20 milliseconds long. During that 20 msec slot, only one user owns it, then he gives it up so that another user can grab a time-slot.

Figure 3 looks at the three dimensions of TDMA technology. In Figure 3 the colors (1) pink, (2) purple, and (3) gold represents three different users sharing time-slots on the first channel.

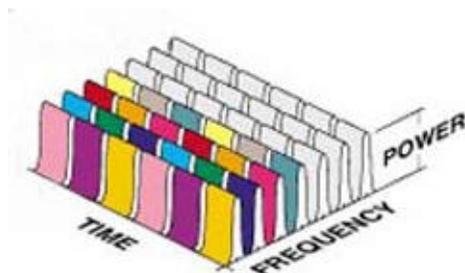


Figure 3 - Three Dimensions of TDMA

The colors light blue, green and dark blue in Fig 3 represent three other users sharing time-slots on the second channel frequency

TDMA represents about a 200% improvement over FDMA (that is: more users) mainly because TDMA is starting to digitize the voice into 1s and 0s and take advantage of digital technologies.

(c) Code Division - Multiple Access

Like many other important inventions, digital communications and specifically Spread-Spectrum technology was developed in a war-time environment. Spread-spectrum was devised to both (1) make it harder for the enemy to hear (intercept) the communications and (2) improve the probability for communications to survive enemy jamming.

CDMA technology evolved after TDMA and was used in the next generation of Cell phones, called G2.5 (that is: Generation 2 and a half). The basic concept is to use Orthogonal Coding to allow you to transmit many, many signals at the same time on the same frequency....and then be able to separate out the individual signals in order to reliably receive them. This really is spread-spectrum...every signal is everywhere!

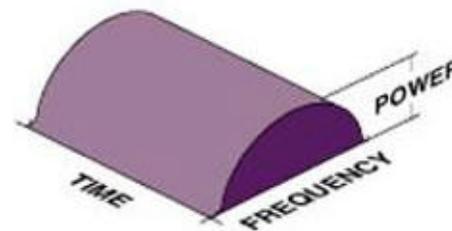


Figure 4 - The Three Dimensions of CDMA

-- see TechTalk cont'd on Pg 7 --

Tech Talk #13 An Introduction to Digital Communications

-cont'd from Page 5 --

How does CDMA do that?? Well, CDMA introduces directional antennas within cells, expands spread-spectrum, and also we need to study how Orthogonal Codes work as digital filters in a future Tech Talk session. I will say that CDMA can usually pack about 50 stations talking simultaneous (25 communicating pairs) in each cell shown in Fig 1.

The next article in the TechTalk Digital Communications series will review Analog-to-Digital converters and how to turn your mike output into a digital stream of 1s and 0s.

December Minutes

(continued from page 1)

Bob KD6BWH also presented the "2001 W6NGO Good of the Club Award" to Bob Eckweiler - AF6C, for his contributions as newsletter editor, net control operator, and FD Team Captain. Since AF6C also prints the award each year for the club, Bob Buss had to be clever and AF6C never knew he had won until the presentation!

Outgoing V.P. Cory - KE6WIU then presented Bob Buss with the 2001 Presidential plaque FOR A JOB WELL DONE and Bob turned the gavel over to CORY to rein as the 2002 club President.

Submitted by Bob - AF6C

**Reminder:
February 2nd, 2002
Next OCARC Breakfast**

WHOis --the Club President??

By
Ken W6HHC

(This is the first in a series of articles to inform you about the background of the officers and leaders of the OCARC.)

The new President for OCARC in 2002 is Cory Terando - KE6WIU. Cory received her first HAM ticket in 1995 and has been associated with the OCARC since 1997. Cory's QTH is in Westminster. At her

QTH she uses a Kenwood TS-570s rig on the low bands, running 100W to a Cushcraft R5 vertical antenna, with an MFJ tuner. She also uses a home-brew six-band dipole designed for 6M/10/12M/15M/17M/20M.

On the high-bands from home, Cory uses an AR-146 from ADI on 2 Meters with a J-Pole antenna. When she is mobile in her Jeep, she uses a Kenwood TM-G707A on 2M and 440. Her newest toy is a Yaesu FT-817 portable 5W low-band rig, with an LDG antenna tuner and a multi-band portable vertical, to use when camping.

Cory's favorite HAM activities are Field Day (see her in action during 15M FD in the picture above), tinkering with electronics (antennas, etc.), and the camaraderie of the OCARC and HAM radio in general.

Cory was born in California. When she is not HAMing it up, she earns a living by being a very talented musical-instrument repair person.

Her favorite non-HAM activities include music, camping, tinkering with metal

working (you should see the terrific "rettysnitch" she made for the ARRL Wouff Hong Ceremony), and she has been known to make a terrific Sangria wine in her spare time.

Cory really loves talking to people (a sign of a good HAM), so make sure you come up to her at the next meeting or club breakfast and ask her about her plans for the FT-817 portable rig.



Wednesday Nets

December Check-ins
(Both 10-meter & 2M nets):

KD6BWH	AF6C
K6CCD	NG7D
W6HHC	KQ6JD
W6KFW	WA5IMI
K3IMW	WB6IXN
KF6LE	AA6QV
KB6TWA	KE6UCH
K6VDP	KE6WOX
N5YRJ	KE6YZW

Check WB6IXN's
Net News page on:
<http://www.w6ze.com>

Minutes of the Board Meeting
(cont'd from page 4)

VP, Treasurer, and 2001 Treasurer to sign the legal signature cards.

Membership:

All records for membership were transferred to the new 2002 membership officer.

Technical: Nothing to report.

Old Business:

Tustin Police Department will be in 2002 Baker to Vegas race, still no word on whether they will utilize OCARC, awaiting more info which should be available by January general meeting. Possibility of OCARC doing backbone for Baker to Vegas race discussed but this is a tremendous responsibility.

New Business:

Discussion about purchasing a laminator for OCARC to be able to laminate member badges on our

own. Bob AF6C is looking into details. Motion made by Larry K6LDC, seconded by Lowell KQ6JD to purchase laminator for up to \$50 plus tax. The motion passed unanimously.

Good of the Club:

Discussion that visitors and guests should be acknowledged before the program speaker begins, to make them feel more welcome. Possibility of starting Mr. RF program again.

Cory would like more club unity, more of a family atmosphere.

As part of this, Cory brought up possibility of having a "nightcap" after the general meetings at the El Ranchito restaurant, on 1st Street between Golden Circle Dr. and Tustin Ave. in Santa Ana. Details will be announced at January general meeting.

A point was made to start giving out Membership Packet to new members, which might include a club sticker,

membership card, temporary visitor's badge sticker for their first meeting, most recent RF newsletter, and copy of club bylaws. Cory will check the bylaws to see if they mention what the contents of a Membership Packet should include. If bylaws do not mention Membership Packet then the details will be discussed at subsequent meetings.

Motion to adjourn by Lowell, seconded by Cory. Meeting adjourned at 9:04 AM.

Respectfully submitted,
Matt K6LNX



ORANGE COUNTY AMATEUR RADIO CLUB, INC
P.O. BOX 3454
TUSTIN, CA 92781-3454

First Class Mail

Time Dated Material.
Please Expedite!!