



RF



ORANGE COUNTY AMATEUR RADIO CLUB, INC.

VOL. XLIII NO. 8

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

August 2002

The Prez Sez:

by Cory - AE6GW

Hope everyone is having a great summer. Things are finally starting to settle down with Field Day and the Fair out of the way. We get a little breather for the month of August, but don't forget we have the Club auction in October and the Officers Elections in November. So while you're cleaning out the shack this summer, please keep the auction in mind and be thinking about who could be nominated for the next slate of officers.

We also have a "Not-So-DXpedition" ham radio camp-out coming up in October. You can learn more on that at the meeting and on Page 5 of this RF newsletter.

See you all at the meeting and 73's--**Cory-AE6GW**

The 2002 ARRL Southwestern Division Convention

The 2002 ARRL SW Division Convention will be coming this summer to the California Center for the Performing Arts in Escondido, California on August 16 - 18, 2002

Featured keynote speakers will be **Jim Haynie W5JBP**, President of ARRL and also **Riley Hollingsworth, K4ZDH**, head of the FCC Enforcement Bureau - Special Counsel for Amateur Radio.

For more details, see the special convention WEB SITE at

<http://sd2002.hamcon.net/>

Where do you get odds that are roughly ONE HUNDRED THOUSAND times better than the LOTTO?

At the OCARC Special Raffle!! If the LOTTO is at \$29,000,000. Your odds are less than one in 29,000,000 to win. BUT...at OCARC with our special raffle your odds are 1 in 285!!!! Although the amount is lower, the odds are Soooooooo much higher.

Won't you consider supporting our Club? The sooner we get to \$288 the sooner you will get to see if you are the winner of the \$250 gift certificate at HRO. See Phil-N7PA at the general meetings and breakfast meetings.

August PROGRAM:

Through the magic of Video Tape, Bob Heil K9EID will be our August guest speaker. Bob will be narrating :

" The Science of Audio "

Learn the difference between microphones used for DX, Contesting and Rag Chewing, along with other audio basics.

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

The next regular meeting will be:

Friday, Aug 16th
@ 7:30 PM

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

In This Issue: Page

The PREZ SEZ	1
ARRL Convention.....	1
Special Raffle.....	1
Aug Meeting – Audio & Mikes ...	1
CLUB INFORMATION	2
TechTalk – Digital Modulation....	3
"Not-So-Dxpedition".....	5
July Meeting Minutes	6
WHOis - the Treasurer	7
August Board Minutes	8

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

P.O. Box 3454, Tustin, CA 92781



2002 Board of Directors:

President:

Cory Terando, AE6GW
(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@arrl.net

Treasurer:

Steve Brody, KB1GZ
(714) 974-0338
stevebrody@sbcglobal.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
(714) 356-4695
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.

Tech Talk #20

Modulation Technologies for Digital Communications

by
Ken Konechy - W6HHC

(This is the sixth part of a Tech Talk series to explore Digital Communications)

In our July discussion of Digital Communications, we covered using "orthogonal coding" to eliminate inter-channel interference. In this article we look at digital communications modulation techniques.

There tends to be three ways to modulate a signal to carry digital information.

- Amplitude modulation
- Frequency Shift modulation
- Phase Shift modulation

Most modern digital communications technology is moving towards one of the many forms of Phase Shift modulation.

AMPLITUDE MODULATION

The oldest form of digital communications modulation is CW. Morse code is simple....either the tone was present or it wasn't. This form of modulation is sometimes known as On/Off Keying (or OOK). This technology is not very sophisticated and did not provide fast throughput compared to other modulation techniques. Also, OOK is very susceptible to noise degradation.

BINARY FREQUENCY SHIFT KEYING (BFSK) MODULATION

Another method to modulate for digital communications is to change frequency. If you use two different frequencies, it is called BINARY. Make it higher for a data bit value of ONE and lower for a ZERO. Teletypes and PACKET (& APRS) are good examples of this modulation technique.

The receiver just needs to determine which of the two frequencies are present....and pass on either a decoded ONE or a decoded ZERO. This modulation scheme is better than CW, but various forms of Phase Shift modulation provide faster data rates.

BINARY PHASE SHIFT KEYING (BPSK) MODULATION

A third way to modulate RF to carry digital information is Phase Shift. Binary Phase Shift keying is a method of doing a digital-to-analog conversion, DAC by using 2 different phases. When you want to transmit a logic ONE, you transmit a carrier with zero phase shift. When you switch to a logic ZERO, then you switch the phase of the carrier by 180 degrees. PSK31 is an excellent example of this form of modulation scheme. Figure 1 shows an example of what BPSK modulation looks like.

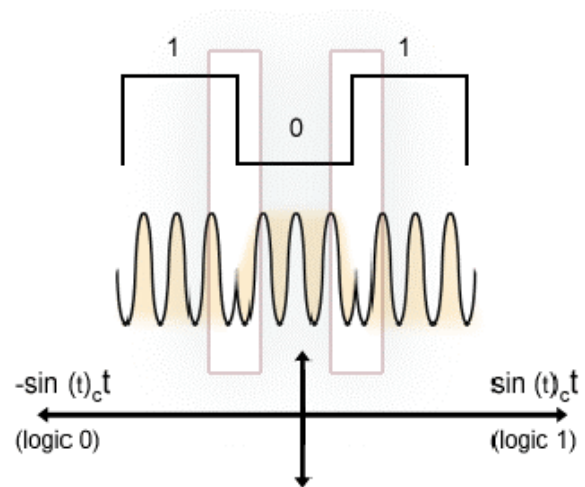


Figure 1 - BPSK signal uses 2 Phase Shifts

Information is imbedded in the phase, not the amplitude of the sine wave. What is important is...is the phase at 0 degrees or at 180 degrees, not the amplitude. This way the design of the receiver detector becomes very easy. BPSK is more robust than BFSK modulation, but the two modulations both deliver the same data rate throughput.

-- see TechTalk cont'd on page 4 --

QUADRATURE PHASE SHIFT KEYING (QPSK) MODULATION

Quadrature Phase Shift modulation means that you work with four different possible phase shifts values. This means that instead of every bit being represented by one phase shift, I can allow each phase shift to represent two bits. This means higher throughput rates.

Two bits can have 4 possible combinations: 00 01 10 11. Rather than have 180 degree phase shifts, we can provide 90 degree phase shifts.....and each phase shift can provide two bits of information as shown in Table 1.

Bits	Phase
00	45-degrees
01	135-degrees
11	-135-degrees
10	-45-degrees

Table 1 QPSK Phase Shift Pattern

In Table 1, the two data bits "00" are represented by a 45-degree phase shift (relative to zero). "01" is a 135-degree phase shift. "11" are represented by negative 135-degree phase shift. Finally "10" is represented by negative 45-degree phase shift.

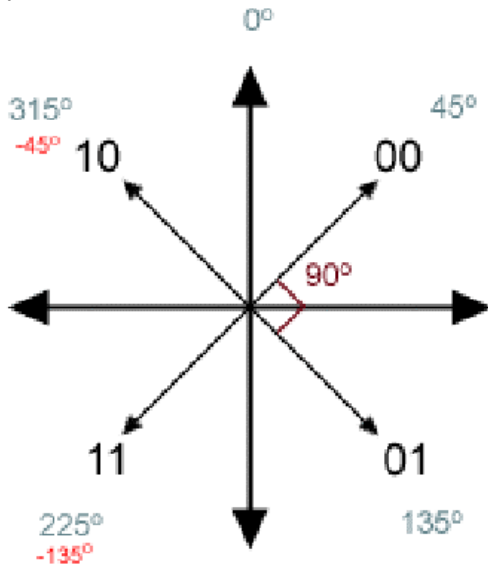


Figure 2 - QPSK Using 4 Phase Shifts

QPSK modulation is used by modern digital cell phone communications, like CDMA. Figure 2 shows a visual map of QPSK.

QUADRATURE AMPLITUDE MODULAT'N (16-QAM & 64-QAM)

Well, if 2 data-bits per phase shift is fast, engineers came up with an even faster modulation technology to

provide 4 data-bits per transition. This technology is called 16-State Quadrature Amplitude Modulation or 16-QAM. The 16-QAM scheme uses a combination of phases and amplitudes to produce a "constellation" of 16 different states. 16 states can convey 4 bits of data, so its throughput rate can be twice as fast as QPSK techniques. 16-QAM has 12 phase angles, 4 of which have 2 amplitude values. Figure 3 shows the constellation of 16-QAM modulation.

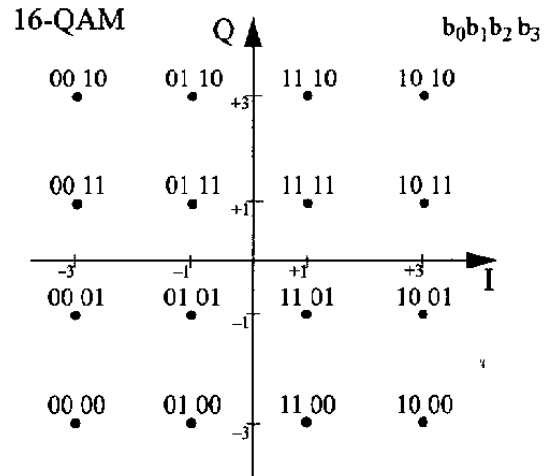


Fig 3- 16-QAM Constellation of Phase Shifts

To provide even faster throughput rates, a newer scheme called 64-QAM was invented to allow encoding 6 bits of data per transition.....even faster! 16-QAM and 64-QAM modulations are used in wireless equipment using the IEEE 802.11a specifications. Equipment using 802.11a use wireless digital communications can connect notebook computers to a Local Area Networks (LANs) inside their company. Some people use this technology to connect two or more computers inside their home together in a network, using wireless instead of running cables.

Table 2 below shows the throughput data rates available on a 5 GHz carrier as used in the 802.11a standard. I also entered a row in the table to show that if I just linearly scale those 5 GHz data rates to 2 M (144 MHz), I should be able to achieve a data rate more than 1 Mbit/sec on 2 M if using 16-QAM!! That is really fast!!

Freq	Modulation	Data-Rate
5 GHz	16-QAM	36 Mbits/sec
5 GHz	64-QAM	54 Mbits/sec
144 MHz	16-QAM	1.03 Mbits/sec

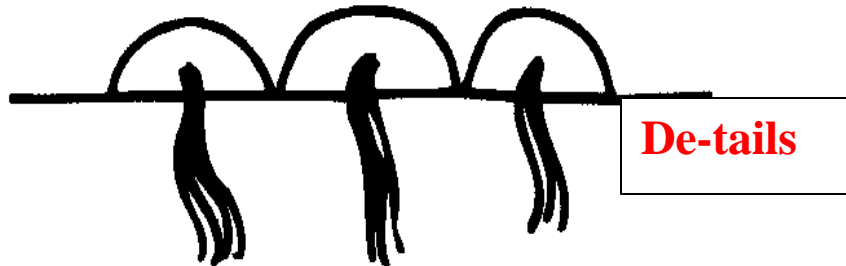
Table 2 - QAM Data Thruput Rates

Next month, I will wind up the Digital Communications series by providing an overview of several receiver detector technologies.

The “hopefully not Last,” “ Not So DX-pedition”

Hold on to your guy wires; here comes the last activity event of 2002. By popular demand, a new “Not So DX-pedition” campout is in the works. Everyone, including guests, are invited. So spread the word!

The details are as follows:



Date: Friday, October 25, 2002 through Sunday AM, October 27,2002

Location: Aguanga, CA (.....just south of Temecula...on private property, high on a hill) or as a Back-Up-Plan if necessary, El Mirage Dry Lake Bed, About 90 miles North of the City of Orange (Maps available at the October meeting, by fax, or by e-mail).

Food: Bring it! (We suggest that we possibly partner in groups for cooking)

Power: The club generator. (bring your own extension cords)
Light bulbs for tenters may be a good idea.

Tents, campers, trailers, motorhomes are all very usable there.

(If we go to El Mirage, there are **toilet facilities** about 400 yards from where we will camp and they are easy to drive to).

Bring **water**, there are no facilities for getting potable water.

Campfire each night, please bring as much wood as you can.

Rigs: You can bring your rigs (HF and VHF/UHF) or if you haven't one to bring, there should be plenty of time available on the rigs that are there. Bring whatever antennas you wish to use.

License: It's a club function, therefore we can use the club call, W6ZE or in the case of good DX, you may wish to use your own.

I'll ask for commitments at the September meeting. Don't miss-out on the fun.

73, Larry, K6LDC

General Meeting Minutes

19 - July - 2002

The program started at 7:30 PM at the Red Cross Building. The business meeting was called to order at 9:05pm. Officers absent: Steve KB1GZ, Phil N7PA, Chris W6KFW, all other officers present.

Meeting Program A great program on "Solar Power Designs and Equipment" was presented by John De Boer - KD6ZKC.

Vice President: August meeting the program will be a tape by Bob Heil K9EID on the "Science of Sound". The September program will be given by Ken Konechy W6HHC on "Digital Communications".

Treasurer: Ken W6HHC was standing in for treasurer. A donation of \$100 to AR Newsline has been made, OCARC makes this donation annually.

Secretary: We received a letter from ARRL saying our Special Service Club distinction has lapsed and needs to be renewed. We need to know how many of our members belong to ARRL for the paperwork to renew our Special Service Club status.

Membership: There are currently 59 OCARC members (and 41 ARRL members) on roster.

Activities: We are hoping to hold the \$250 gift certificate raffle at the Christmas dinner. This does not mean we will stop the raffle early if we have not made enough money (we will run the raffle until it reaches \$250 + 15% for the club).

Technical: Fun time was had at the Orange County Fair by all who participated.

Members at Large: Bob KD6BWH wants to thank all participants who volunteered at the OC

Fair. The Ham Radio booth won 1st place over all other organizations that were in the OC Exhibit Hall.

OCCARO is requesting donations to help offset costs for the OC Fair operation. Bob requests donating \$50. Vote and discussion on the donation has been tabled until the next Board Meeting.

Old Business: Field Day: Scores sent in to ARRL. 45 people turned out to help, either members or visitors. Compliments to the Field Day Chairman, Larry K6VDP, and compliments to the FD chef, Don - KC6ONZ.

Ham radio class at OCC begins this fall (starting the week of August 26th), suggestion was made to send a blurb to HRO. The class is listed in the OCC catalog as Computers & High Technology 108: Survey of Technology. It will be held on Fridays, from 2pm to 5:30pm. The course will include instruction on Technician class theory, General class theory, and Morse code, and a VE testing session will be held at the end. More info about OCC, including how to register, can be found at www.occ.cccd.edu.

Mr. RF: The person appointed to be the Mr. RF mystery Ham for this meeting did not show. Mr. RF will resume next month.

New Business: We received a letter requesting assistance with identifying some radio equipment, from a widow of an SK, Harry Barnard W6NEO. Al W0KJV and Larry K6VDP volunteered to help.

Al W0KJV is selling some color printed copies of RF for \$5 for the whole bunch, to cover the cost of printing.

Motion to adjourn by Frank WA6VKZ, 2nd by Bob AF6C.

The meeting was adjourned at 9:30pm.

Respectfully submitted,
Matt K6LNX

WHERE OCARC MEMBERS LIVE

Have you wondered where all of the members of the OCARC live? The list below shows where we live. The largest concentration live in the City of Orange...as you can usually tell from the club nets.

Orange	10
Garden Grove	7
Santa Ana	7
Irvine	6
Tustin	6
Costa Mesa	5
Anaheim	3
Moreno Valley	2
Westminster	2
Antioch	1
Anza	1
Buena Park	1
Cerritos	1
Fountain Valley	1
Laguna Niguel	1
San Clemente	1
Yorba Linda	1
Out-of-State	4



Steve Brody - KB1GZ at his shack in Orange

WHO is the Treasurer ? by Ken W6HHC

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

The Treasurer for the OCARC this year is Steve Brody KB1GZ. Steve became interested in HAM radio when he was 11 years old, through the HAM radio involvement in the Andrea Dora ship collision in 1956, off the North American coast. Steve became fascinated with a LIFE magazine article that explained that the only radio operator able to maintain communications with the damaged ships was a teenage HAM in North Carolina. After college and marriage, Steve finally got his first HAM ticket in 1975 as WB1CDD in Massachusetts. He also HAMED it up in Texas and then went in-active for 10 years. Finally, Steve got active again in 2000, here in California, and got the new call KB1GZ. To his amazement, he met the North Carolina HAM from the Andrea Dora collision who was presenting a program on his role in the ship collision at the Anaheim Radio Club. Steve joined the OCARC in 2001.

Steve lives the City of Orange. His primary base station is a Yaesu TS-2000 - an all mode 1.8-thru-440 MHz (including built in 'satellite modes'). His low-band antenna is a GAP Titan vertical in his backyard. The base VHF/UHF antenna is a Comet vertical for 50/144/440.

For mobile operations, Steve uses a 144/440 Kenwood model TM-D700-A/E. The mobile antenna is a Comet dual-bander vertical for 144 and 440..

Steve's favorite HAM radio activities are rag-chewing and contests.

Steve was born in New York City. He currently works for a medical device manufacturer as a regulatory affairs specialist. He and his wife, Doris, have lived in Mass, New Jersey, Connecticut, Texas, New York and California.

Non-ham activities include reading books and traveling to see the country.

Steve is now interested to get started in satellite, PSK-31 and APRS aspects of HAM radio.

August Board Meeting

The Board Meeting was held at Cow Girls Too Café on Saturday, 03-Aug-2002. All board members were present, except Chris W6KWH (on vacation) and Matt K6LNK (at band event). There were 15 people including officers, members, and visitors.

SPEAKERS

Lowell announced that the August meeting program will have a video on microphones and audio from Heil Audio. The September meeting program will be "Digital Communications" by Ken W6HHC.

TREASURER

Steve KB1GZ reported that the YTD income was \$1,469, YTD expenses were \$933, and the net account in the bank is \$2,885.

MEMBERSHIP

Chris W6KWH is still on vacation. Lowell will check to see if Dick W6RWY is willing to do the publishing and mailing of the RF newsletter again in Aug.

ACTIVITIES

Phil N7PA reported that there may be a discrepancy

in the number of tickets that have been reported sold for the club Special Raffle, (a \$250 Gift Certificate for HRO). He will investigate this further.

OLD BUSINESS

Cory AE6GW reported that the OCARC had a very successful day at the Orange County Fair on July 17th.

Bob KD6BWH, Chairman of OCCARO, asked for a \$50 donation to cover costs of the Orange County Fair put on by OCCARO. The board unanimously voted to donate \$50 to OCCARO.

NEW BUSINESS

Larry K6LDC announced that he was organizing a NOT-SO-DXpedition ham radio campout near Temecula, on Oct 25-27, 2002. All are welcome. See this RF newsletter and WEB site for details.

FOR THE GOOD OF CLUB

Cory AE6GW announced that Jim Winn (who was KE6UCH) has passed his Extra Class license exam and now sports the call letters, AE6UC. Congrats go out to Jim!!

Respectfully submitted,
Ken-W6HHC (Acting!?)

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

First Class Mail

***Time Dated Material.
Please Expedite!!***