The Prez Sez:

During the February general meeting, we did something different, after the club business. Each member talked about his view of HAM Radio and its various facets. A big thank you goes to Rick KF6UEB for the idea. We had great participation and comments, by everybody.

I also, wish to thank Art KQ6HF for his talk on RF Exposure and its Dangers. This is something to think about, not only at home, but at Field Days.

Phil N7PA informed us that Frank Smith WA6VKZ, was in the CV ICU at St. Joseph’s Hospital. But, Ken W6HHC has informed me that Frank has since been discharged to home and is anxious to get back on the air. Let’s all wish him a full and speedy recovery.

It has been brought to my attention that renewal of club dues has been slow. Remember the end of March, is the end of the grace period.

See you at the meeting, 73’s----Lowell-KQ6JD

DUES are DUE!!

A friendly reminder for those who might have forgotten to renew their club membership for 2003. The grace period is ending! The OCARC annual dues are due by the end of March. We don’t want to lose you as a member!!

Phil – N7PA
Treasurer

March Meeting

The guest program speaker will be Margaret Signorelli, WA6PZO, one of the first women to take her amateur radio hobby to sea.

Margaret will provide a presentation entitled:

"...Being a Radio Officer on Super Tankers"

Does Ham Radio and Oil really mix? Learn about her being on the first ship in Valdez, Alaska after the Exxon Valdez went aground, and the real story behind the incident.

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

The next general meeting will be:

Friday, Mar 21st
@ 7:30 PM

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

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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
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

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.

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.
Antennas and feedline cannot be discussed without hearing the word impedance. What exactly is impedance and where and why is it important? This month we’ll try to answer these questions.

Looking at the input terminals of an antenna, that antenna can be represented closely by the circuit in figure one. The values of the three components, a resistor, a capacitor and an inductor determine the impedance of the antenna. The impedance is made up of two parts, resistance and reactance. Let's look more carefully at each of these parts. The resistive part is what does the work and is called the real part. It absorbs the energy from the antenna, turning it into either a radiated signal (good!) or heat (not good!). The inductive and capacitive components combine to determine the reactive part. The reactive part of the impedance absorbs no energy and is thus referred to as the imaginary part. The reactive part causes the voltage and current peaks to occur at different times in a cycle; this is called phase shift (See Sidebar on page 4).

The reactance of an inductor is a positive value while the reactance of a capacitor is a negative value; both measured in ohms. The total reactance of an inductor and capacitor in series is the sum of these values. (Note that when you add the capacitive reactance you are adding a negative number.)

Figure 2a is a simple graph. The horizontal axis represents the resistive part of the impedance and the vertical axis represents the reactive part. The horizontal axis starts at zero at the left, since the resistance cannot be negative. The reactance can be positive or negative so the vertical axis passes through the zero point of the horizontal axis. Inductive reactance is plotted above.

-- See TechTalk cont'd on page 4 --
the horizontal axis and capacitive reactance, being negative, is plotted below it. The horizontal axis is labeled \( R \) for Resistance and the vertical axis is labeled \( jX \) for reactance. (Remember that reactance doesn’t absorb any power and is the imaginary part. Since the symbol “\( i \)” was already taken to represent current, “\( j \)” is used to signify “imaginary”.) We’ll talk more about “\( j \)” more in a future article. For now don’t treat it as part of the equation; instead think “an imaginary”. When you see “ \( -j20 \, \text{ohm} \)” say “minus ‘an imaginary’ twenty ohms”.

Let’s assume that, at a specific frequency, the components in figure one have the following values: \( R = 40 \, \text{ohm} \), \( XC = -j20 \, \text{ohm} \) and \( XL = +j50 \, \text{ohm} \). The resistance can be plotted on the horizontal axis as shown by ‘\( R \)’ in figure 2b. Before \( jX \) is plotted it must be calculated by adding the two values: \( +j50 \, \text{ohm} + (-j20 \, \text{ohm}) = +j30 \, \text{ohm} \). This is plotted on the vertical axis as ‘\( X \)’ in figure 2b. A new point ‘\( Z \)’ can be plotted on the graph where lines drawn through the points and perpendicular to their axis cross. The point ‘\( Z \)’ represents the impedance and is often written in the form: \( Z = 40 + j30 \, \text{ohm} \). Impedance always has two parts; here it’s represented by a real part ‘\( R \)’ and an imaginary part ‘\( jX \)’. Impedance can be represented in another way too, by its magnitude and the phase angle; we’ll say more about that later.

Resonance

Earlier it was mentioned that reactance causes the voltage and current peaks to occur at different times in a cycle. Capacitive reactance will cause the current to peak before the voltage, and inductive reactance will cause the voltage to peak before the current. This difference (called phase shift) can be between -90° and +90° or up to a quarter of a cycle (one full cycle is 360°.) When the inductive reactance and capacitive reactance are equal they add to zero. When they do, the voltage and current peaks occur simultaneously, the phase shift is said to be zero and

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Sidebar - Phase Shift

When an AC voltage is applied to a pure resistance the voltage and current peaks occur simultaneously, and the voltage and current are said to be “in-phase”. However, when an AC voltage is applied to an impedance that contains a reactive part, the current \( ‘I’ \) and voltage \( ‘e’ \) peaks occur at different times. This time difference is measured as an angle; where 360° is one full cycle of the AC voltage. The angle is referred to as “phase-shift” and is often designated by the symbol ‘\( \varnothing \)’. When the reactive part of the impedance is positive (inductive) the voltage peak occurs before the current peak (Figure 3a), and when the reactive part of the impedance is negative (capacitive) the voltage peak occurs after the current peak (Figure 3b).
OCARC BOARD MINUTES
March 01, 2003

OCARC Board Meeting was held at Cowgirls Too Restaurant. 8:30AM Meeting called to order by Pres. Lowell KQ6JD. Board not present: Phil N7PA; Bob KD6BWH; Matt K6LNX; Frank WA6VKZ. Quorum being present. Minutes from 2/1/03 board meeting were approved as read.

Old Business:
Bob AF6C discussed badges being changed to free to new members. Motion: Bob AF6C moved to charge $3.00 for badges for new and replacement badges as well as $1.50 for License upgrades with a new call. Seconded Steve KB1GZ. Discussion--Question: Passed.

Field Day: Use same team captains for FD as 2002.

New Business:
Letter from our Insurance carrier offering terror insurance for $16.00. K6LDC Moved to reject offer for terror coverage. Seconded by Steve KB1GZ. Approved.

Domain Name renewal for Web site. Motion by K6LDC to spend $100.00 for 5 year renewal. Seconded by KQ6JD. Approved.

Publicity: Larry K6LDC handed out press release draft for Field Day. This will be distributed to local newspapers and put on the website. Copy attached to minutes.

Meeting adjourned at 9:10 AM

Respectfully Submitted
David Mofford W7KTS
Secretary
2003 ARRL Southwestern Division
Amateur Radio Convention, Long Beach, CA.
www.hamcon.org
Save these dates: September 5, 6 & 7, 2003
"Focus Back on the Volunteer"

VE Testing
Vendor Exhibits
Saturday Luncheon
Technical Forums
Wouff Hong
Sunday Breakfast
Many PRIZE Drawings
Demonstrations
Grand Banquet

This year we will be in beautiful downtown Long Beach. This year's Convention Headquarters is the:
Hilton Long Beach, 701 West Ocean Blvd., Long Beach, Ca. 90831-3102.

Early Bird Registration
Registrations post marked by
April 30, 2003
$10.00 Per Registrant
Which INCLUDES
One Logo Pin
Send registrations to Hamcon
address below.

Pre-Registrations
Registration Post Marked from
May 1 to August 1, 2003
$12.00 Per Registrant
Which INCLUDES
One Logo Pin
While quantities last

Last Minute and
Walk-In Registrations
Registrations received after
August 1, 2003, and Fri., Sat. &
$15.00 Per Registrant
INCLUDES One Logo Pin
While quantities last

Location:
701 West Ocean Blvd., Long Beach, CA. 90831-3102. For Reservations call 800-445-8667
Mention "HAMCON" for a fantastic rate of $89 per night double occupancy.
Note: The last day to register and get this rate is August 15, 2003.

Call Sign: ___________________ Name:________________________________________________
Address:_________________________________________________________________________
City:________________________________ State/Prov:__________ ZIP /Postcode________________
Your E-Mail Address:_________________________________ Club Affiliation:_________________

Please List additional Attendees
No Charge for Children 16 years old or younger. They Must be accompanied by a registered adult.

KIDS   ADULT  Call Sign  Name (Please Print Clearly)
____    ____    _________ _________________________________________________
____    ____    _________ _________________________________________________
____    ____    _________ _________________________________________________

Note: Every attendee must be registered, including the kids

_______ Registrations at $_______ ea. = $
_______ Extra Pins at $ 3.00 ea. = $____________
_______ Kids under 16 = Free
_______ Banquet Tickets* at $ 35.00 ea. = $
*Please indicate preference: ( )Beef ( )Chicken ( )Vegetarian
_______ Saturday Luncheon at $ 20.00 ea. = $____________
_______ Sunday Breakfast at $ 17.00 ea. = $____________

Total Due = $____________

Make convention registration checks payable to: HAMCON Inc.
Mail this form to: HAMCON Registration, P. O. Box 333, Pomona, CA. 91769-0333
the impedance is purely resistive. This phenomena is said to be “resonance”. At resonance the imaginary part becomes zero but is usually still included: \( Z = 50 + j0 \) ohm (impedance is equal to 50 plus an imaginary zero ohms.) Whenever you see the value j0, it signifies resonance.

In Figure 2c a line has been drawn from where the two axes cross (the origin) to the point ‘Z’. Look carefully at this line; notice that it has a difference length than either R or jX. This length is call the “magnitude” of the impedance. It can be calculated by Pythagorean’s theorem (I’ll leave solving this to the readers who care!) but the answer is 50 ohm magnitude. If you again look carefully at the line you’ll note that it makes an angle to the horizontal axis. This angle is called the phase angle and yes it is exactly the same phase angle we talked about above. What will this line look like at resonance? Think for a minute; we know that at resonance \( jX = j0 \), the phase angle is zero and the impedance is purely resistive. Thus the line must lie on the horizontal axis and must end at the point R. This impedance line is called a vector; it has

--- See TechTalk cont’d on page 8 ---
two parts, magnitude and direction! Why is it called a vector? So mathematicians and engineers can impress management and demand higher salaries!

Thus, the second way impedance may be specified is by its magnitude and phase angle and an impedance such as \( Z = 40 + j30 \) ohm is often written as: \( Z = 50 \) ohm \( <+38^\circ \) (Impedance is equal to a magnitude of 50 ohms at a phase angle of 38 degrees.)

Which representation of impedance you use depends on what you're trying to do or show. Usually one form makes computation easier than the other in a given situation.

Why is impedance important? The impedance of the antenna plays an important role in the transfer of power from the transmitter. We'll discuss this further in a future article.

In the next article on Impedance in Bob's Tech Talk series, we'll look at how the impedance at the antenna's terminals is affected by changes to the antenna, and why 'R' plays such an important part, especially for vertical antennas. This month we covered the heavy stuff (but hopefully did it lightly enough); in the next article we'll have some fun.

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**Club Nets**

February check-ins for Wednesday evening 10M and 2M phone nets and the Sunday morning 40M OCWN CW net:

- KD6BWH   W7KTS
- AF6C     K6LDC
- K6CCD    KE6LEX
- KS6CW    WA6NOL
- K6GVG    W6NT
- AE6GW    KE6OIO
- KB1GZ    WA6RND
- W6HHC    KF6TRA
- K3IMW    KB6TWA
- WB6IXN   KF6UEB
- KQ6JD    K6VDP
- K3JIL    WA6VKZ
- W6KFW    WA6VPP
- KG6KGG   KC6VQH

Check WB6IXN's NetNews monthly reports on WWW.W6ZE.ORG