

CQ de WA2LQO

The official voice of the Grumman Amateur Radio Club

April 2012 [No April Fooling] Volume 85 Number 4

COMMUNICATIONS SYSTEMS (Continued from March 2012)

By Bob Wexelbaum, W2ILP

I must correct a typo error that occurred last month in my explanation of Dixon's spread spectrum (SS) criteria. It was: 1) Modulation of a carrier by a digital code sequence whose *chip* rate is much higher than the information bandwidth. Such systems are called "direct sequence". *Chip* should have been CHIRP. So let us now define CHIRP. In the old days of radio telegraphy the receiving operators listened to the received heterodyned tones of Morse code. Some transmitters keyed their oscillators which caused the received tones to chirp. This undesired chirping could also be caused by poorly regulated power supplies. In the spark coil days chirping was always prevalent. Hams then reported RST (readability, sensitivity, *tone*). The Tone report was a way to quantize chirp as frequency instability. Modern transmitters have just about made the Tone report obsolete. You can't simply recognize chirp unless you can hear it audibly and Hams thus used it as a way to report frequency stability. CHIRP is also very important feature of RADAR systems, where it is desirable. Electronic Countermeasures Operators (ECMOs) were taught to recognize and identify RADAR signals by listening to their audio. Frequency Chirp is purposely used for improving the tracking precision of many RADAR systems.. Spin phase elements in some microwave dish antennas provide phase shifting jizzle which also sounds like chirping. Let us not get off the topic of basic communication here, but speaking of audio let me remind you that Morse code is the only code that Hams can decode by ear. However all of the digital modes have unique sounds. We can recognize the unique sound of an RTTY, a PSK, or an MFSK signal by ear, although we cannot decode them by ear. Only an audio card in your PC may do the decoding.

Now back to SS. There is some controversy about SS systems which have a chirp rate or hopping BW that is "very much larger" than the normal signal bandwidth would be required to be. How much is very much? Does the mathematic evaluation depend on some criteria that would be different for "much larger" as opposed to "larger"? This is reminiscent of Carson's critique of Armstrong when analyzing the merits of NBFM compared to wide band FM. The digital modes that Hams are permitted to employ on HF can be received well within the bandwidth of an SSB receiver. Indeed such a bandwidth (less than 2.5 kHz) is large enough to become a spectrum analyzer for many digital mode signals and present many simultaneously on what is called a waterfall display. A very large bandwidth frequency hopping system might require the receiver to also frequency hop using the same hopping system as the transmitter. This, if properly accomplished, might have different S/N capability than receiving the signal with a relatively wide band receiver that would normally be open to a wider band of undesired signals than a receiving system that is open only to the instantaneous transmitted bandwidth and thus can be more selective. We must also consider the noise level which will usually vary depending on the receiver's bandwidth filtered response. An analogy can be made about an SS hopping system where the receiver hops synchronously with the transmitter. It is like a game of tennis where a player must be at the right positions to hit a ball which may come at him from various angles. The receiver must be there and ready to be responsive for the required window of opportunity. Switching at the transmitter and the receiver is akin to multiplexing. Hardware considerations must be taken seriously to provide for clean switching that does not introduce artifacts or additional noise. In recent times this has been provided by microchip techniques that were formerly considered impossible, when discrete components were used.

Now we can again ask, “Why bother with SS?” The answer includes properties that may be cited as:-

1. Selective addressing capability.
2. Code division multiplexing is possible for multiple accesses.
3. Low-density power spectra for signal hiding.
4. Message screening for eavesdropping.
5. High-resolution ranging.
6. Interference rejection.

These properties come about as a result of the coded signal format and the bandwidths that result. A single receiver or a group of receivers may be addressed by assigning a given reference code to them, whereas others are given a different code. Selective addressing can then be as simple as transmitting the proper code sequence as modulation. Not all of these characteristics however are necessarily available at the same time. It is somewhat anomalous, for instance, to expect, at the same time, a signal that can be easily hidden but can also be received in the face of a large amount of interference. Signal-hiding requirements and interference are often at odds, but the same system might be used for both by using lower-power transmission when low detectability is desired and high-power transmission when maximum interference rejection is needed. Obviously this is accomplished in cell phone systems. When codes are properly chosen for low cross correlation, minimum interference occurs between users, and receivers set to use different codes are reached only by transmitters sending the correct code. Thus more than one signal can be unambiguously transmitted at the same frequency and at virtually the same time; selective addressing and code-division multiplexing are implemented by the coded modulation format. Because of the relatively wide band signal spectra generated by code modulation, the power transmitted is low in any narrow region (where the duty cycle is low). At any rate, the spectral density of an SS signal is far less than conventional signals in which all the transmitted power is sent in a band of frequencies commensurate with the baseband information bandwidth. Because of the coded signal employed, an eavesdropper cannot casually listen to messages being sent. This feature is not applicable to Ham communication, where there is no desire to hide the signal and the signal must be easily monitored by the FCC. Though such hiding may not be “secure”, it requires some conscious effort to hack into it. It is like the door locks that only can serve to keep the honest but passively curious people out.

(To be continued)

PRESIDENT’S NOTE by ED GELLENDER, WB2EAV

The ARRL has for a while offered internet viewing of back issues published since the mid ‘80s. That was when word processors came out, so that searches and the like could be done, Until now all of the earlier issues were on microfiche – photos – only available in person at Newington. Soon, they will be adding them to the website as PDF files. Then, we will be able to sit back and relax with some early writings by The Old Man himself (Hiram Percy Maxim W1AW), or maybe some construction articles from the ‘50s by Lew McCoy, W1ICP.

Speaking of websites adding new information, just today the census bureau put the data of the 1940 census on their website. It is something of a first and there were so many people checking it out that the whole website clogged up and stopped. Somehow I don’t think that the ARRL website will have that problem with their historical issues of QST.

Doctors and educators are very concerned lately that too many teenagers today are what they call technology addicts. Even while in constant communication with friends on their portable devices, the conversations are rarely thought-provoking. Therein lies one answer to why so few kids these days are interested in ham radio. Ham Radio uses technology to provide real people with meaningful communication; What we are seeing too often now is people hiding behind technology to avoid meaningful communication.

Ed, WB2EAV

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**GRUMMAN AMATEUR RADIO CLUB
MINUTES OF GENERAL MEETING 3/21/2012**

By Karen, W2ABK, Secretary

The meeting was called to order by Gordon at 5:40 PM

TREASURER'S REPORT – Ed, WB2EAV

Finances continue to be in good shape.

REPEATER REPORT – Gordon, KB2UB

The repeaters are working.

NET REPORT – Karen, W2ABK

Thursday night net at 8:15 PM on 146.745 MHz had two check ins.

Thursday night net at 8:30 PM on 145.330 MHz had six check ins.

Sunday morning net at 7:10 AM on 7.289 MHz was noisy.

Sunday morning net at 8:20 AM on 14.289 MHz – Had two check ins but copy was difficult.

VE REPORT – Bob, W2ILP

There were three applicants; one Technician, one General and one Extra Class. All passed.

VEs were Karen, W2ABK, George WB2IKT, and Bob, W2ILP.

OLD BUSINESS

We need programs for our meetings.

NEW BUSINESS

Jack has a permit for our summer picnic, August 15, 2012 at 4:00 PM at Marjorie Post Park, in the gazebo area. Club equipment insurance is due. Our board meeting of April 11th has been moved to Haypath Park.

PROGRAM

Dave AB2EF, brought his home-made Keyboard Morse Encoder and provided some good CW practice.

The meeting was adjourned at 6:15 PM.

GARC NETS: HF: 7.289 MHz at 7:30 AM EST Sundays Net Controller: Eugene, W4JMX

As per Gene's recent message, operation on 14.289 MHz or 21.289 MHz may be attempted if 40 Meters is not usable. Comments or suggestions may be e-mailed to Gene. His e-mail address is:-
w4jmx@earthlink.net

2 Meters (repeaters) Net Controller, Karen, W2ABK **Thursdays: 146.745 MHz at 8:15 PM**

145.330 MHz at 8:30 PM

Both repeaters (-600 kHz) and 136.5 Hz tone.

ARES/RACES NETS: Mondays.

MEETINGS: General Meetings of the GARC are held on the third Wednesday of each month, starting at 5:30 PM, at the Ellsworth Allen Park in Farmingdale. Driving directions and map can be obtained from <http://www.mapquest.com>. It is suggested that the GARC web site be checked to be certain of meeting location, which may change after this newsletter is distributed. Board meetings are held a week before the General Meeting at the Bethpage Skating Rink Center.

WEBSITE: The GARC web site can be found at <http://www.qsl.net/wa2lqo>. Webmaster is Pat Masterson, KE2LJ. Pictures of GARC activities, archives of newsletters, roster of members, and other information about the GARC may be found there

2012 MEMBERSHIP DUES ARE DUE

For those who haven't already paid: Dues are: \$20 each, or \$25 for two members who reside at the same address. Retirees living out of town need pay only \$10. We are now offering an introductory \$10 rate to new members, which should be included with a membership application form. Checks should be mailed to: Grumman Amateur Radio Club, P.O. Box 0644, Bethpage, NY 11714-0644.

SILENT KEYS

K2DQ, John M. Lennon of Hauppauge, NY died on June 14th, 2011. He had been a member of The Great South Bay Amateur Radio Club and was active as an HF DXer and on Field Days.

W2FGD, Marvin T. Fricklas of Freeport, NY died in March 2012. Marv was a founding member, net controller and past president of LIDXA. He was always an active DXer.

W5YI, Frederick Maia of Arlington, Texas died on March 28th 2012. He was the original owner of W5YI-VEC and National Radio Examiners. He published study guides for all exams and was on the committee that wrote the questions. Some guides were written in cooperation with Gordon West. Fred retired in 2000, leaving the management of the W5YI Group to NB5S, Larry Pollack. Fred published a famous newsletter called "The W5YI Report" from 1978 to 2003. Although he often differed with the ARRL, Fred always had Ham Radio's interest in mind and he established a competitive but cooperative alternative which the GARC continues to use.

INTERNET LINK OF THE MONTH FOR INTERNERDS

The link for last month was: <http://hackaday.com/2012/02/27/visualizing-a-nanosecond/>

I got interested in Grace Hopper and learned from her interview with TV host David Letterman that at the age of 80 she is now a retired Rear Admiral, but remains active as a civilian computer programmer. While sorting old issues of the GARC newsletter, I was surprised to find that Grace Hopper was mentioned in an article about programming languages in the January 1997 issue. Dave Anderson, KA2FEA (sk), the editor at the time, said that the article was excerpted from Compton's Interactive Encyclopedia. Here is part of that article:

The first commercial high-level language was called FLOW-MATIC and was devised in the early 1950s by Grace Hopper, a U.S. Navy computer programmer. In 1954, as computers were becoming an increasingly important scientific tool, IBM began developing a language that would simplify the programming of complicated mathematical formulas. Completed in 1957, FORTRAN (Formula Translating System) became the first comprehensive high-level programming language, and it is still widely used today in engineering and scientific applications. <End of quote> The article went on to discuss COBOL and BASIC.

Like most engineers, I had to take a FORTRAN course. The text book was "A Guide to FORTRAN IV Programming" by Daniel D. McCracken. I don't know how relatively important FORTRAN is today, but in the '60s to '80s it was considered to be important enough to include in all EE curricula [even for those who did not plan to be programmers]. Many old timers who never studied it in school were literally forced to take a FORTRAN course at work.

And now for this month's link you may click on: <http://forums.qrz.com/showthread.php?339133-Fake>

See a man fly like a bird! At first the QRZers thought it was a fake. Then, I found other links that explained how it was done. The man did not get lifted by his energy alone. He was assisted by small motors powered by lithium cells. Run the video and scroll down for the comments.

PUZZLE

Last month I presented this question, taken from the Amateur Extra Class Exam.

What is one of the potential hazards of using microwaves in the amateur radio bands?

- A. Microwaves are ionizing radiation.
- B. The high gain antenna commonly used can result in high exposure levels.
- C. Microwaves often travel long distances by ionospheric refraction.
- D. The extremely high frequency energy can damage the joints of antenna structures.

The correct answer is B.

Here is another question from the Extra Class Exam.

How is antenna efficiency calculated?

- A. (radiation resistance / transmission resistance) x 100 %.
- B. (radiation resistance / total resistance) x 100 %
- C. (total resistance / radiation resistance) x 100 %
- D. (effective radiated power / transmitter output) x 100 %

The correct answer will be given next month.

GARC Officers

President: Ed Gellender, WB2EAV M/S:X08-14 516-575-0013 edward.gallender@ngc.com

or wb2eav@yahoo.com

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2 Yr. Board Member: Dave Ledo, AB2EF

2 Yr. Board Member: Jack Hayne, WB2BED

2 Yr. Board Member: George Sullivan, WB2IKT

Newsletter

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Editor: W2ILP 631-499-2214 w2ilp.radio@gmail.com or w2ilp.radio@yahoo.com

Contributing writers: All GARC members (we hope). To submit articles or ham equipment advertisements contact the editor. Articles will only be edited when permission is granted by the author.

GARC Webmaster

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GARC VE Exams

We normally proctor exams for all classes of ham licenses on the second Tuesday of each month, starting at 5:00 PM. The exams are given at Briarcliffe College, 1055 Stewart Avenue, Bethpage, NY in room: Long Beach #5. Ham Exams are: Element 2 – Technician, Element 3 – General, Element 4 – Amateur Extra Class. All applicants must pre-register by contacting W2ILP. Time and location of exams are subject to change. If there are no applicants VE sessions will be cancelled. The fee for 2012 remains \$14 for all exams taken at one sitting. New first time applicants should be aware that their Social Security Number will be required on the application form unless they register with the FCC for an FRN. Applicants for an upgrade should bring their present license and a photocopy of it. All applicants should bring picture ID such as a driver's license. Study material may be bought from the ARRL-VEC or W5YI-VEC <http://www.arrl.org> or <http://www.w5yi.org>. All VECs use the same Q & A pools.

Commercial FCC Radio Operator Exams

We are certified by the National Radio Examiners to administer exams for all classes of FCC commercial radio operator and maintainer exams. All Commercial Operator License Examiner Managers (COLEMS) use the same commercial license pools. Adminstrating fees vary. For information or to register contact W2ILP.

Editorial

There are no applicants for scheduled April exams as of this time. The ARRL Section Newsletter is again posting my old optonline e-mail address. It had been corrected but somehow it has changed back to the old address. I have informed Mike, and hope that it will get corrected in future months. My address is OK on the ARRL website's VE exam listing, and this is the most important.

My son, Mark Wexelbaum, is planning to return to Long Island in July, after living in American Samoa for over seven years. Although Mark is not a ham he had previously been helpful in antenna installation work. Now that I am more limited in doing physical work, I am hoping that he will again be of assistance with outdoor antenna jobs.

My hobbies include stamp collecting, raising pineapples as house plants, baking bread and pizza crusts, Asian wok stir-frying, making sake wine from raw ingredients, and caring for Rusty, the family cat...but Ham Radio will always be my most important hobby. Although I am a collector of lots of stuff, I don't collect any guns, weapons or toy trains. Every man has to have some limitations. -w2ilp--

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THE AMERICAN LEGION AMATEUR RADIO CLUB

I am a member of The American Legion. Membership is open to all military veterans who have served in combat zones. The national headquarters of The American Legion is in Indianapolis, Indiana, but each state of the USA has regional headquarters. There are individual meeting groups called “Posts” which are active in many local communities. Although I live in Commack, I belong to Post 944 of Kings Park, NY, which is the most active of nearby posts. It currently has 160 dues-paying members, most of which are senior citizens. The posts, like ham clubs, are not able to attract many new young members. There is a monthly meeting and a monthly dinner as well as many local activities at the Kings Park American Legion building. I have not met any Hams there but I did meet a member who is a retired Grumman Field Service Engineer.

Recently I read in “The Legion”, the monthly magazine of the American Legion, that there is an amateur radio station, K9TAL, at the Indianapolis headquarters that would be operating on 14.270 MHz SSB on March 15-16, 2012, and it would issue commemorative certificates to any hams who worked it. K9TAL was commemorating the 93rd birthday of the American Legion. I’m not so avid a certificate collector, but I took the time to see if I could hear K9TAL on 20 Meters, using my IC-706 and my attic antenna. I did not expect to get through, especially since there was quite a pile-up on the frequency. However, after only one call from me, two strong stations came on, both saying “Give a clear channel to ILP guys...He is on the frequency”. I never received such a welcome in any other pileup. I don’t know who the helpful hams were who apparently recognized my call sign. I worked K9TAL! I sent a QSL card to K9TAL and visited the K9TAL website. At the site I learned that The American Legion Headquarters Ham station is very new. The site offered free membership in the American Legion Amateur Radio Club to all who are both legionaires and hold ham licenses. I filled in an application and received a membership card in a few days. Soon after that I received a very nice commemorative certificate in reply to my QSL card. There was no request for postage. This and other Ham activity has served to renew my interest in Ham Radio, which I admit had been fading in recent years. – w2ilp-