

# CQ de WA2LQO

Sixty Eight Years: 1944 -2012

*The official voice of the Grumman Amateur Radio Club*

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The August General Meeting will be a Picnic at Marjorie Post Park, Massapequa.  
*See president's note.*

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## COMMUNICATIONS SYSTEMS (Continued from July 2012)

By Bob Wexelbaum, W2ILP

Last month I discussed RTTY and BPSK-31. I will now continue to define other keyboard modes that have become popular with amateur radio operators.

### **MFSK:**

MFSK is Multi-Frequency Shift Keying. RTTY uses only two radio frequencies, but MFSK-16 (the most popular amateur form of MFSK) uses 16 possible frequencies. MFSK is, in a way, similar to the Lamarr-Antheil concept of communicating with 88 player piano tones. MFSK was, however, used long before Hedy and George proposed their idea. Listening to an MFSK signal audio on any receiver that has a BFO, or with an SSB receiver, will produce a signal that may sound musical to most ears. The French and Belgians called MFSK *Couculet*, which means "Rooster." The British called MFSK *Piccolo*. An early Piccolo system used 32 tones, making it musical indeed. Popular MFSK-16 transmits 16 tones, sent one at a time at 15.625 baud. The tones are spaced 15.625 Hz apart. Thus the total bandwidth is 316 Hz, which can pass through a narrow CW filter. Phase shift keying is actually used in order to eliminate key click splatter that would make the BW greater than 316 HZ. The present MFSK-16, was developed for hams by Murray Greenman, ZL1BPU and it differs from older commercial MFSK. Murray's software is called *Stream*. This software was further developed by Nino Porcino, IZ8BLY. Unlike some older MFSK methods or PSK-31, no arrangement is made to synchronize timing and it is assumed that timing will be synced by the signal itself. Fine tuning requires some skill. It cannot be done by rotating the SSB transceiver's RF tuning knob. It can only be accomplished by the controlling software. The SSB transceiver must have excellent frequency stability so that once tuned the signal does not drift out of sync. Like FM and RTTY the signal has constant amplitude and thus the transmitter may employ non-linear amplification. The text is sent employing FEC *Forward Error Correction*. The FEC method used detects only keyboard code processing errors at the transmitter. The typing rate through put is 42 WPM, even with FEC, because a varicode method is used, similar to PSK-31, but not the same code. Each code represents four binary bits, so that MFSK-16 can easily transfer binary computer files. The computer sound card can detect the signal using an FFT *Fast Fourier Transform* technique, using Viterbi decoder routine software developed by Phil Karn, KA9Q. Computer sound cards using FFT can also provide phase information, AGC, and a waterfall (spectrum acquisition) display.

A common use of telephone line MFSK is Dial Tone Multi-Frequency (DTMF). It differs from MFSK-16 in that two tones are always transmitted at the same time. The telephone touch tone buttons form a four by four matrix. There is a different audio frequency for a total of eight different tones. 16 of the possible two tone combinations determine if 1 - 9, \*, O, A - D, or # has been depressed. The two tone method reduces the possibility that dial button tones might get erroneously triggered by singular frequencies within human voice audio. We all know that almost all phones are now equipped with touch tone dials that can quickly switch our phone calls to anywhere in the world, without a human operator's assistance, provided that we subscribe to a required calling and billing plan.

## **HELLSCHREIBER:**

Hellschreiber differs greatly from any of the other keyboard modes. It has been called a hybrid digital-analog mode and a fuzzy mode. It is neither. It is simply a digital mode, just like ham CW is a digital mode. The final display of Hellschreiber on your computer monitor is not derived from a code that was converted to ASCII. It is a scanned raster which forms a 7 by 7 matrix for each transmitted character. The black pixels of each character are transmitted by keying the transmitter with "key down"; technically the same as Morse code would be transmitted when a telegraph key is depressed. When the key is not down nothing is transmitted. Thus Hellschreiber's duty cycle is similar to that of CW. The Hellschreiber character picture displays the black pixels against the background of white noise. Spaces between characters are also seen as white noise. Thus we basically have a black and white display. This basic method was invented by Rudolph Hell in order to utilize a simple mechanical keyboard which keyed an ordinary CW transmitter. Modern versions of Hellschreiber have improved the signal by digitally shaping the pixels to improve their rise and fall times by digitally processing them with high resolution software. This makes it possible to transmit gray pixels, although normal text does not require gray pixels. When experimentally transmitting pictures or logos gray pixels may be used. The present 7 by 7 matrix method allows for transmitting all of the capital and small letters of the alphabet, all numbers, and most punctuations and symbols that are found on computer keyboards. Unlike television picture synchronization there is no attempt to synchronize the vertical or horizontal scan. The vertical scan is allowed to start at any time. Its scan rate is derived from the computer clock and is usually very accurate. The software provides for small adjustments of the vertical scan rate, which might be needed if the characters appear to be slanted. In most cases adjustment is not required. Because the vertical scan is not synchronized each character is displayed twice. This results in at least one line of text being readable, while the other line may be split between the top and bottom of the displayed line. The horizontal rate is actually the rate that is determined by a real time speed for transmitting lines of text. The most common Hellschreiber mode now being used is Feld-Hell, which would be compatible with Rudy Hell's original mode. This mode is capable of transmitting 150 characters per minute (30 WPM). Each character takes 400 ms to complete. Because there are 49 pixels (7 x 7) per character, each pixel is 8.163 ms long. Rudy keyed a CW transmitter directly but now we key our SSB transceivers by keying a 900 or 980 Hz tone.

Next month we will continue discussing more keyboard modes that are used by hams..

(To be continued)

## **PRESIDENT'S NOTE by ED GELLENDER, WB2EAV August 2012**

This month in place of our usual meeting, we will be having our annual picnic on Wednesday, August 15<sup>th</sup>. It officially starts at 5:30 PM, but if you can, try to get there earlier to help set up and start cooking. We usually leave at dusk. The usual fare is hotdogs, burgers, etc. If you call Jack Cottrell, WA2PYK at 516-249-0979 to let him know that you are coming, we can match the amount of food to the expected turnout.

The picnic will take place at Marjorie Post Park in Massapequa. Take NY135 to the last southbound exit, NY27A(Merrick Rd) East. Proceed 3 miles to Unqua Road. Turn left onto Unqua, and shortly turn left into the park. Turn left yet again and wrap around to the rear of the park. Continue on foot to the gazebo.

For a long, long time our club has used Post Office Box 644 in Bethpage as our mailing address. In the past few years the cost for that PO Box has risen drastically and is now \$120 per year. That is getting a bit pricey for the amount of mail we get. We have decided to renew for 6 months (exactly half price) while we consider alternates. The first thought is to use my work address, but that requires my name, company, and mail stop in addition to the street address (whew!). Another possibility is to use a member's house; So much easier to address things. We will also have to use the new address on our checks. Any other ideas?

Ed, WB2EAV

**GRUMMAN AMATEUR RADIO CLUB  
MINUTES OF GENERAL MEETING 7/18/2012**

**This meeting was cancelled as Ellsworth Allen Park was unavailable (a concert).**

*The following minutes were derived from the Board Meeting minutes of 7/11/2012.*

**TREASURER'S REPORT – Ed, WB2EAV**

Finances continue to be in good shape.

**REPEATER REPORT – Gordon, KB2UB**

146.745 was not working. *It apparently was repaired and now seems to be better than ever. –w2ilp-*

**NET REPORT – Karen, W2ABK**

Thursday night net at 8:15 PM on 146.745 MHz had no check-ins.

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

Sunday morning net at 7:30 AM on 7.289 MHz had two check-ins, but was very noisy.

*Karen maybe temporarily off the air until she can put up antennas at her new QTH in Huntington.*

**VE REPORT – Bob, W2ILP**

The July VE session was cancelled because there were no applicants.

**OLD BUSINESS**

Our Field Day score got signed.

**NEW BUSINESS**

Our picnic is scheduled for August 15th at Marjorie Post Park in Massapequa. We meet to set up as early as 3:30 PM, but meeting starts at 5:00 PM. We hope to see everyone there!

**PROGRAM**

Jack, WA2PYK brought in historical pictures of the GARC from 1971 and past Field Days.

**GARC NETS: 40 Meters: 7.289 MHz at 7:30 AM EST Sundays**

Net Controller: Eugene, W4JMX

**2 Meters (repeaters) Thursdays: 146.745 MHz (-600 kHz) at 8:15 PM**

**145.330 MHz (-600 kHz) at 8:30 PM. Tone for both repeaters: 136.5 Hz.**

GARC Net Controller Karen, W2ABK

**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.

**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.

## INTERNET LINK OF THE MONTH FOR INTERNERDS

In past issues of this newsletter, Dave Ledo and I had written about Compact Fluorescent Light bulbs (CFLs). I have often wondered about what may actually be in the base of a CFL, so the following post in the QRZ Ragchew Section caught my attention. A handy ham (K8ERB) had carefully sawed into the porcelain base of a CFL to reveal the electronic components on a little printed board within it. Not satisfied with that accomplishment, the guy then built a QRP CW transmitter that used most of the CFL's components. That is another way to save energy if you can be satisfied with only 1.25 Watts of RF. I myself think that 20 Watts of light would be a more efficient energy saving for most folks who aren't handy hams. The internet link for this month is:

[forums.qrz.com/showthread.php?354951-Inside-a-CFL](http://forums.qrz.com/showthread.php?354951-Inside-a-CFL)

If that doesn't get you there try Googling up QRZ Rag Chew Central. Then go to thread page 6 or so and look for the CFL thread.

If you haven't registered with QRZ by now, I would suggest that you do so. There is no obligation to pay anything to register so that you can log onto any of the QRZ forums, reply to or start threads, and optionally add biographical information and pictures to your identification that will be seen by anyone who looks up your call sign on QRZ. . All you need to do is to register with your call sign and establish a password. Once you are registered you can use all of the QRZ features that you might be interested in. The Ragchew Section is a forum open to miscellaneous chatter, not necessarily about ham radio itself. Posts about science, art, history, economics and philosophy are found there, as well as jokes about those subjects. Extreme political debates are deleted by the moderators as are posts that become insulting, rude or too far from being PG rated. The policies of QRZ should be read by new posters. Most hams are gentlemen and can tolerate those who may disagree with them.

### PUZZLE

*Last month I asked this question, taken from the new Amateur Extra Class Exam.*

Which of the following HF modes can be used to transfer binary files?

- A. Hellschreiber
- B. PACTOR
- C. RTTY
- D. AMTOR

The correct answer is B.

*This month I will again ask a question taken from the new Amateur Extra Class Exam.*

What is the National Radio Quiet Zone?

- A. An area in Puerto Rico surrounding the Aricebo Radio Telescope
- B. An area in New Mexico surrounding the White Sands Test Area
- C. An area surrounding the National Radio Astronomy Observatory
- D. An area in Florida surrounding Cape Canaveral

**GARC Officers**

President: Ed Gellender, WB2EAV M/S:X08-14 516-575-0013 edward.gellender@ngc.com  
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Treasurer: Ed Gellender, WB2EAV (see above)

WA2LQO Trustee: Ray Schubnel, W2DKM Retiree

1 Yr. Board Member: Jack Cottrell, WA2PYK Retiree 516-249-0979

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

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**

Pat Masterson, KE2LJ Retiree 813-938-4614 Pat-Masterson@tampabay.rr.com

**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 is \$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. Administrating fees vary. For information or to register contact W2ILP.

**Editorial**

I have been continuing to attempt to work the Sunday WAG Net. I have barely managed to hear Gene, W4JMX in Florida on some Sundays. Joe, W2IYS of Smithtown checks in regularly as does Karen, W2ABK. Karen has been off the air lately because she has moved from Greenlawn to Huntington. Karen plans to be back on the air when she installs her antennas at her new QTH.

On July 11<sup>th</sup> my son Mark arrived at JFK from American Samoa. He is presently unemployed and seeking work. As most may know the present job market makes it difficult to find employment, so Mark is living with us for now. With his help, I repaired my air conditioning unit. It required replacing the outdoor fan motor and associated capacitor; Removing the fan blades from the old motor shaft was quite difficult so I bought a wheel puller tool set for that task at Harbor Freight. The new Harbor Freight store in Commack has the largest selection of tools that I have ever seen in one store. We "fix-it-ourselves guys" should check out Harbor Freight for any tool requirements, including electrical work. –w2ilp--

Grumman Amateur Radio Club  
Sixty Seven Years 1944-2011  
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**A Letter From Bert, K2DOD  
Via Jack Cottrell**

When I sent out the Picnic report, Bert responded and told me about his health. I asked him if I could share this with his friends in the club and he agreed. Here is his report (slightly edited) and addresses if you want to contact him.

Jack, wa2pyk

Bert Wengler [nmwpgk@aol.com](mailto:nmwpgk@aol.com)  
3312 Dorado Pl  
Carlsbad, CA 92009-7706

Hi Jack,

I will attend the WA2LQO picnic in spirit, but my body will be in California. I am glad to be living here, near my son and his family.

I was hospitalized last August for an infection in my left leg. Then I recently broke out with shingles on the right side of my face and scalp, which landed me in the hospital again. I was isolated and had an EKG (like a Holter monitor) reporting by telemetry, along with blood pressure and other vitals, every four hours. They also rapped a finger for blood glucose readings a few times a day, but by treating carbohydrates as condiments I kept my blood sugar low enough that I did not need any insulin this time.

July 6<sup>th</sup> was my 80<sup>th</sup> birthday. Getting old is not easy; We get old too soon. 73, Bert, K2DOD