



**CQ**  
de WA2LQO  
VOL 84 NO.8

Just in: Zac Zilavy WB2PUE, SK (details on page 6)

Also on page 6: Club Picnic August 18

### Communications Systems (continued from July 2010)

By Bob Wexelbaum, W2ILP

Continuing with our study of probability we can contemplate two experiments A and B with outcomes A<sub>sub1</sub>, A<sub>sub2</sub>...and B<sub>sub1</sub>, B<sub>sub2</sub>... The probability of the joint occurrence of A and B is written P(A<sub>j</sub> and B<sub>k</sub>) or simply P(A<sub>j</sub>,B<sub>k</sub>). Suppose that the probability of B<sub>k</sub> depends on A<sub>j</sub> not occurring. For example, if we are given 4 balls in a box, 2 white and 2 black. The probability of drawing a white ball is 1/2. If having drawn a ball we replace it and draw again, the probability remains the same 1/2. Suppose however that the first ball drawn is not replaced it becomes another experiment. If the first ball drawn was white, the probability of drawing a white ball now becomes 1/3. If the first ball drawn had been black, the probability of drawing a white ball on the second draw would be 2/3. Thus we have an experiment where the probability of the final outcome is *conditioned* by the first outcome. The probability of the outcome B<sub>k</sub>, given that A<sub>j</sub> has occurred, is called the *conditioned probability* and written P(B<sub>k</sub>|A<sub>j</sub>). Suppose that we perform the experiment N times (when N is a very large number) when determining which pairs of outcomes of experiment A and B occur jointly. Let N<sub>j</sub> be the number of times that A<sub>j</sub> occurs with or without B<sub>k</sub>, N<sub>k</sub> the number of times B<sub>k</sub> occurs with or without A<sub>j</sub>, and N<sub>jk</sub> the number of times of joint occurrence. Then  $P(B_k|A_j) = N_{jk}/N_j = [N_{jk}/N]/\{N_j/N\} = P(A_j, B_k)/P(A_j)$

When we have N<sub>jk</sub> – N<sub>kj</sub> then  $P(A_j|B_k) = N_{kj}/N_k = [N_{kj}/N]/[N_k/N] = P(A_j, B_k)/P(B_k)$

From this we have  $P(A_j, B_k) = P(A_j)P(B_k|A_j) = P(B_k)P(A_j|B_k)$  so that  $P(A_j|B_k) = [P(A_j)/P(B_k)]P(B_k|A_j)$  which is known as *Bayes' Theorem*. The last equation applies equally to the case of a single experiment whose outcome is determined by two events, or simply stated if experiment A and experiment B are to be considered as a single joint experiment. For example if we have 2 white balls and 2 black balls in a box it becomes obvious that the probability of picking a black ball after picking a white ball is the same as if we pick two balls and find the first white and the second black. Next suppose that A<sub>j</sub> and B<sub>j</sub> are the probable outcomes of either two experiments or the joint outcome of a single experiment, but the outcome B<sub>k</sub> simply does not depend on which outcome A<sub>j</sub> accompanies it. This is when we say that A<sub>j</sub> and B<sub>k</sub> are *independent*. *Complete independence* is expressed by  $P(B_k|A_j) = P(B_k)$  which yields  $P(A_j, B_k) = P(A_j)P(B_k)$ . Expressed in words this means that when outcomes are independent, the probability of a joint occurrence is the product of the probabilities of the individual independent outcomes. Which means that  $P(A_j, B_k, C_l, \dots) = P(A_j)P(B_k)P(C_l) \dots$

The term RANDOM VARIABLES is used to signify a *rule* by which a real number is assigned to each possible outcome of an experiment. We let the outcomes of an experiment be defined by the symbols: Lambda i. For example the outcome of a horse race could be the name of a horse who wins the race. "I gotta horse right here...His name is Paul Revere...Can do?...Can do!...". Lambda i might be the names of all of the horses in the race. The rule of *functional relationship* represented by the symbol X( ), is called a *random variable*. When used this way the term random variable is a misnomer since X( ) is not a variable and is in no way random, being a perfectly definite rule. However extending the meaning of the random variable term as it is also used to refer to a variable which may assume ANY of the *numbers* X(Lambda i). In many cases (Lambda i) may be

numbers. For example let us consider measuring a random voltage  $V$  between a pair of terminals and find a number of possible outcomes  $v_1, v_2$  or  $v_3$ . We could use the identifying number symbols  $\Lambda_1 = v_1$ ,  $\Lambda_2 = v_2$ , and  $\Lambda_3 = v_3$ . We can also use a rule which says that the number assigned to an outcome is the very same number used for identifications. It might amaze you to learn that;  $X(\Lambda_i) = X(v_i) = v_i$ . We then can refer to the voltage itself as a random variable and represent it by  $V$ . A random variable may be *discrete* or *continuous*. It is discrete if any finite interval of  $X(\Lambda)$  assumes only a finite number of distinct values. An example of such a discrete random variable is the tossing of a die. There are only six possible outcomes when we toss a single die. However in the case where  $X(\Lambda)$  can assume any value within an interval the random variable is continuous. Thus suppose that we shoot an arrow at a target. Because of wind current and other unpredictable influences the arrow may miss its mark, and the magnitude of the miss will be a *continuous random variable*. The *cumulative distribution function* associated with a random variable is defined as the probability that the outcome of an experiment will be one of the outcomes for which  $X(\Lambda)$  is less than or equal to  $x$ , where  $x$  is any given number. The probability will depend on the number  $x$  and also  $X(\ )$  that is by the rule that we assign numbers to outcomes. Thus we use the symbol  $[F_{\text{sub } x(\ )}](x)$  to represent the cumulative distribution function and we now have the definition;  $[F_{\text{sub } x(\ )}](x) = P[X(\Lambda) \text{ for values less than or equal to } x]$ . Should this newsletter be continuously distributed? Continue following these articles next month when I will define DISTRIBUTIONS with an example of PROBABILITY DENSITY which will lead to SPECTRAL POWER DENSITY which might enable us to understand Gaussian spectral distribution and white noise with some probability. (to be continued)

**PRESIDENT'S NOTE by ED GELLENDER, WB2EAV**  
**AUGUST 2010**

I have mentioned my thoughts about generators for Field Day on and off for some months now. In short, I was wondering if there isn't a better way than using the generator that Northrop Grumman provided for us. I never really followed through on it though.

Well the company is making the decision easier. After insisting for years that we keep the generator in the trailer with the 146.745 repeater, they have changed their minds. Now all gasoline-powered devices are to be kept together in a special shed on the other side of the railroad tracks. I have been told that we can have access to the generator any time we want as long as I notify the facilities department two weeks early to plan for it. The problem is that we only take the generator on a Saturday morning and return it on a Sunday afternoon...and facilities do not work on weekends. I can see where this is going.

So, for all intents and purposes we are on our own. I have to spend the next ten months or so looking into what can be rented. Bill, N2SFT has been a real sport, using his trailer to schlep the generator, but if we cannot find a source of something small enough to fit in a car trunk, at least Bill can rent something closer to home. I know that he has done it cheerfully, but all the hassle that goes along with it has to be draining.

We are now in the summer doldrums and I have been traveling for business a lot, so there is not much to report this month. I just read in the papers that there have been some solar storms and as a result they are expecting some spectacular aurora borealis (northern lights) displays unusually far south, although I do not expect to see anything at our latitude. I figure that has got to be related to sunspots and possibly a harbinger of good HF propagation. Maybe we can finally get some good low band DX now.

Lately, most mornings on my way to work, I throw out my call on the 146.745 Bethpage repeater. Hearing nothing, I repeat on the 145.33 Hauppauge repeater to the same effect. The crowd of fellows who used to populate the repeater during rush hours seem to have totally dissipated. If you get the chance, give a listen to one of those repeaters for a few minutes; Maybe we'll find each other.

GRUMMAN AMATEUR RADIO CLUB  
MINUTES OF GENERAL MEETING 7/21/2010  
By Karen. W2ABK, Secretary

**The meeting was called to order by Karen at 5:45 PM**

**TREASURER'S REPORT – Ed. EWB2EAV**

Finances continue to be in good shape.

**REPEATER REPORT - Gordon, KB2UB**

The Hauppauge site was robbed of copper tower grounding connections. Our 5.33 repeater is working OK but lightning protection may have been compromised.

**VE REPORT – Bob, W2ILP**

There were no applicants for the July VE/CE session and it was cancelled. The Technician test was changed as of July 1, 2010 and prospective applicants may still be studying.

**NET REPORT – Zack, WB2PUE**

Thursday night net on 145.33 had a few check-ins. Sunday morning 40 Meter net was quiet. Zack , WB2PUE has been in Good Sam Hospital for the past week. We send him our get well wishes.

**OLD BUSINESS**

We are seeking programs for future meetings.

Joe, WA2BAJ has moved to North Carolina. He is happy at his new QTH and says hello to all. Joe can be reached at jescott@triad.rr.com

Pat, KE2LJ has passed his railroad engineering license test and has been driving trains in Florida. Congratulations Pat!

**NEW BUSINESS**

Our August general meeting will be a Picnic at the Syosset Woodbury Park, the same place as last year. We plan to meet at 4:30 PM. Everyone is welcome!

**PROGRAM**

We discussed generator options for our next Field Day.

**The meeting was adjourned at 6:15 PM**

**GARC NETS:**

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

Net Controller: Eugene, W4JMX

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

**145.330 MHz (-600 kHz) at 8:30 PM EST Thursdays**

Net Controller: Zack, WB2PUE

**[Tone for both repeaters is 136.5 Hz]**

**(ARES/RACES) Mondays**

**MEETINGS**

General Meetings of the GARC are held on the third Wednesday of each month, starting at 5:30 PM. The meetings are usually held at the Ellsworth Allen Park in Farmingdale. Driving directions and maps 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.

## GARC WEB SITE

The web site of the GARC 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

The website for this month is something different. It is where you can apply to subscribe to a free semi-monthly newsletter called "Avionics Intelligence". Once you get on their list you will receive the front page of the newsletter by e-mail and it will provide links to get more information on each headlined article. The newsletter covers military and commercial aircraft and all of the new avionics on them along with who makes what and what contracts have been signed. It should be of interest to all who are interested in modern aircraft and want to keep up with what is new and approved. Although I am retired I remain interested in recent developments and I suspect that many of you may also be curious about the evolution of avionics technology.

The link has a long address, but it is well worth the task of copying it carefully...

<http://nasx-media.com/portal/wts/cgmceruce72Leck8BqoD6wicrev93Da>

I tried it and it works.

## PUZZLE

**Here is another Cryptogram:**

NI NYL'I LRURYYJFM IX NWJZNLB IBR KXFCA RLANLZ NL HNFR XF NUR -  
IBRFR JFR IKX XIBRF EXYYNVNCNINRY: XLR NY EJERFKXFD JLA IBR XIBRF  
NY LXIJCZSJ.

--HFJLD OJEEJ--

**Solution to the July 2010 Cryptogram:**

**IT IS DIFFICULT TO GET A MAN TO UNDERSTAND SOMETHING WHEN HIS SALARY  
DEPENDS ON HIS NOT UNDERSTANDING IT.**

--UPTON SINCLAIR--

CQ de WA2LQO

August 2010

Volume 83, Number 8

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**CONTRIBUTING WRITERS**

All the members of GARC (we hope!)

CQ de WA2LQO is published monthly by the Grumman Amateur Radio Club for its members and friends. Send articles and amateur equipment advertisements to: W2ILP. Articles may be sent by e-mail or postal mail. They can be in MS Word format or simply in plain text. Articles will only be edited when permission is granted by the author.

**ELECTRONIC SUBMISSIONS**

For insertion to the WA2LQO website, information may be sent to Pat Masterson.

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Ed Gellender's e-mail address:

Edward.Gellender@ngc.com or wb2eav@yahoo.com

## EDITORIAL

We now have fewer VEs than ever and we are even shorter on certified Commercial Examiners (CEs). A fellow contacted me by e-mail saying that he wanted to be tested for a GROL with Ship Radar Endorsement, so I tried to get a team of CEs ready for our August 10th scheduled exam session. George Sullivan informed me that he couldn't be available on the 10th but could make it on the 3<sup>rd</sup> so I made the August session on the 3<sup>rd</sup>, instead of the 10<sup>th</sup>. Meanwhile I was contacted by a man who wanted to take the ham radio Technician exam. He also agreed to come to Briarcliffe on the 3<sup>rd</sup>. Ed, George and I ran the session and both of the applicants passed their exams.

I file the applications for new ham Technicians via the Internet to W5YI-VEC. I received the following e-mail from the new Technician: "Hey Bob, I just checked the FCC web site and my information was already in. My call sign is KC2YZY...not even 24 hours since I was tested! Thanks." We have received other thank-you notes from hams who were surprised at the speed which their data was processed. We will also have to reschedule our September VE/CE session because it conflicts with primary elections. That is why applicants must register. 73, w2ilp (I License People)

## GARC VE EXAMS

We are continuing to proctor exams for all classes of ham licenses on the second Tuesday of each month, starting at 5:00 PM.

The present exams are:-

Element 2: Technician

Element 3: General

Element 4: Amateur Extra Class

The fee for 2010 is \$14.00 for all exams taken in one sitting. The ARRL-VEC now charges \$15 but W5YI-VEC has decided not to change the required fee.

Applicants for upgrades should bring their present license and a photocopy of it and know their FRN number.

New, first time applicants should be aware that their Social Security number will be required on their application form, unless they register with the FCC for an FRN.

All applicants should bring picture ID such as driver's licenses.

Exams are given at Briarcliffe College

1055 Stewart Avenue

Room: Long Beach #5

Bethpage, NY

Briarcliffe, Bethpage is located in a building that was formerly part of the Grumman complex.

All applicants should contact W2ILP to register; If no applicants apply, the exam session will be cancelled.

For any related information e-mail w2ilp@optonline.net or phone:-

(631) 499-2214

Study material is available at the web sites of the

ARRL-VEC:-<http://www.arrl.org> or

W5YI-VEC:- <http://www.w5yi.org>

All VECs use the same Q&A pools.

The Technician exam Q&A pool has been changed and is now in use as of July 1, 2010.

Since the beginning of the VE program the GARC has provided opportunities to take the ham exams monthly, during all 12 months of every year.

## CE EXAMS

We are certified by the National Radio Examiners to administer exams for all classes of FCC Commercial Radio Operator Licenses. All CEs use the same Q & A pools.

To register for commercial exams contact W2ILP.

### GRUMMAN AMATEUR RADIO CLUB OFFICERS FOR 2010

President	Ed Gellender	WB2EAV	X02-14	516-575-0013
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2 Yr Board Member	Jack Cottrell	WA2PYK	Retiree	516-249-0979
Trustee WA2LQO	Ray Schubnel	W2DKM	Retiree	

### STANDING COMMITTEE CHAIRMEN

Contact VE:	Bob Wexelbaum	W2ILP	Retiree	631-499-2214
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**GRUMMAN AMATEUR RADIO CLUB**  
**Sixty Six Years 1944 -2010**  
**P.O. Box 0644**  
**Bethpage, NY 11714-0644**

FIRST CLASS

DO NOT DELAY

**Zac Zilavy WB2PUE - SK**

Breaking News 8/5/10

While editing CQ for print, we were saddened to hear of the passing of Zac Zilavy, WB2PUE earlier today. Our sincerest condolences to Zac's family and friends.

For decades, Zac has been a pillar of the club and enjoyed running the Thursday night net. He will be sadly missed.

Everyone for whom I have an e-mail address received funeral arrangements. Unfortunately, the mailed copies will not arrive until after the funeral. -WB2EAV

**PICNIC 2010**

Our August 18<sup>th</sup> meeting will be our annual picnic. It will begin at about 4:30 PM at the Syosset-Woodbury Park, where we had it last year. All members and spouses, etc. are invited and the food is free. If you plan to attend and haven't already done so, please contact Jack Cottrell, WA2PYK by e-mail: [jjcottrell@verizon.net](mailto:jjcottrell@verizon.net) or telephone at (516) 249-0979, so that he can get a head count. The entrance to the park is on the south side of Jericho Turnpike (NY25) about half a mile

east of the NY135 Expressway (opposite the Fox Hollow Country Club). Bear right and you will see the picnic grove to your left on your way to the parking lot.