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# BARA

## Facts

*Newsletter of the Binghamton Amateur Radio Association*

*July 2004*

Website: <http://www.wtsn.binghamton.edu/bara>

### *Closed Ranks or Best Foot Forward?*

The latest issue of *QST* has some interesting words on recruitment and retention in our ranks. It seems that an average of twenty-five percent of the Hams that join our ranks each year drop out by the time the first anniversary of their licence rolls around. Think of it, that is a pretty significant fall-out rate and each and every one of those Hams had to study and work to get their Ticket. Why do we lose them?

A first — and obvious — answer is that perhaps they did not find what they were looking for in Ham Radio. That's a reasonable answer and there is probably a fair measure of truth to it, but it might also be well to pause for a moment and ask ourselves if we might be able to do something to help decrease this fall-out.

Each and every one of us can likely recall one, two, or more people who have made a mark in our life at some critical juncture. It might be a teacher who opened our eyes to a subject we previously thought irrelevant or boring, it could be a family friend or neighbor who helped direct us to a career or course of study, or it might be a casual acquaintance who took a little extra interest in us and helped change the course of our life. Coming closer to home, there may be one or two cherished Elmers who initiated us in the mysteries of Electronic Theory, Contesting, or Chasing DX.

Now think again, but this time think about people who had the opposite effect. Think about those times when a thoughtless word or well-intentioned, but mis-directed criticism discouraged us or turned us away from something that we might have found of interest. Do you regret those encounters? Do you ever wish that someone might have kept silent instead of "laying it on the line" for you?

I think you get my drift. There may be those of us who "make it on our own" in life and in this Hobby Single-Band Two-Meter Handi-Talkies are recommended. This does not mean that you can't use a

we call Ham Radio, but there are also those who need a bit more encouragement and direction as they blunder their ways through the intricate paths of our Art. It's something to consider when we come across a new face at a meeting, a freshly-minted call sign at a Hamfest, or an unfamiliar voice on the Bands. Our reaction (and our action) might be just the spark that keeps someone on "our" side of the ledger.

### **501C Status**

Our Club's application for 501C Status is proceeding well. The State Attorney General has confirmed that BARA is registered with the New York Charities Bureau and the Certificate has been sent to the judge for approval. Once approval is granted the next step will be a filing with the New York Department of State after which IRS Approval should follow.

### **Calling All Amateurs**

The 27<sup>th</sup> Empire State Games will be conducted in our area from 28 July to 1 August. This is a serious undertaking and it needs a lot of support from the Amateur Community which is tasked with Health and Welfare Communications Support for the games.

Ford Drake, AB2HS, has been developing the Communications Plan for the Games and everything should be in readiness. All you need is a little time to spare and a 2-Meter Hand-Held (see the article that follows for other practical details).

It's not too late to volunteer to help with Communications. If you are willing to help out, please contact the Amateur Radio Host Co-Chairs Dorothy, K2YEH, or Steve, K2CDJ, ([k2yeh@arrl.net](mailto:k2yeh@arrl.net) or [k2cdj@arrl.net](mailto:k2cdj@arrl.net)).

### **Preparing for the Games**

If you are planning to help out with the Empire State Games (and every bit of assistance will be appreciated) here are a few suggestions from the organizers:

Dual-Band, but if you have a Single-Band Two-Meter unit, than that is the one you should probably use if only

because these units seem to handle Intermod with less trouble. You should also use a unit with a minimum of 1-Watt output. Anything less may not cut the mustard from some of the venues and Net Control will be busy enough without having to ask for repeats and fills. If it happens that you are assigned to a venue that requires a Cross-Band or other specialized link, you will be provided with a radio programmed to the appropriate frequencies.

Vox is a no-no. Many venues will have high levels of ambient noise and it would be likely that Vox would trigger when least wanted. Shut off the Vox and use Push-to-Talk. By the same token, take a Headset (or at least ear-buds) so that you will not need to ask for repeats.

A good long Rubber Duck is in order. The little stubs that are handy at Hamfests when you use Simplex to chat with your buddies are not going to do the job here. You want to radiate all the signal you can. You might also want to read the manual and learn how to lock your keypad — a bump or jostle could easily put you “off frequency”.

Plan for shifts that are two to four hours long with most shifts running a full four hours. Take along a Water Bottle, Sunglasses, Sunscreen, Raingear, and any personal medications you might need. An Energy Bar or other “portable snack” would be a useful addition to the spare batteries for your HT!

Remember, we are there to support the Health and Welfare of the Athletes and to that end you must shadow the Trainer or other official you are assigned to. The Trainer, Doctor, or State Director makes the call in any situation that develops and requests that you communicate through Net Control. If you happen to be assigned to an outdoor venue, it is critical that you stay close to your assignment and that you notify him or her if Net Control passes on a Lightning Warning (standard practice is to clear an outdoor venue if lightning is reported within five miles).

For other information please check out the official Website <<[www.empirestategames.org](http://www.empirestategames.org)>>.

Our series on the Digital World has covered a lot of ground, but we have really only scratched the surface. This month we look at how an Analog Signal might be converted to a Digital Representation. This pulls together most of the material and it begins with the recognition that an Analog Signal is something that varies over time. The simplest example of this is a musical tone of constant pitch — a Sine Wave. When we present a single tone to a microphone the output of

## Standards and Such

Following up the notes on Test Equipment Categories included in a preceding BARA Facts it's worth taking a look at how the standards are met.

Self-Certification is a way of saying that the manufacturer of a device has declared it to conform to some particular standard. Aside from the obvious legal penalties involved in mis-representation of a product, the only thing that really upholds a self-certification is the good name and reputation of the manufacturer. Some names we trust, others may be a bit dogy and there is always the very shady ploy of selecting a name and logo that are almost — but not quite — identical to a reputable company (see, for example, the \$10.00 Rolox wristwatch).

An Independent Testing Lab Certification is a step upwards and could be considered as close to a guarantee of the “real McCoy” as possible. True, certifications can be forged, but by-and-large the UL, CSA, and TUV stamps carry a certain authority that is jealously protected.

A new symbol that might be a bit confusing is the **CE** mark. This is an indication of conformance to certain European Commission Directives and is required on equipment sold within the European Union.

Note: the **CE** mark is a declaration by the manufacturer and does not signify independent testing.

How much should this matter to us as Amateurs? It really depends on you and on the type of measurements you plan to make. For low-voltage, low-current applications a “Dollar Mart Special” may be plenty good enough, but for measurements at line-voltage levels or where high currents may be delivered a reliable high-quality instrument is indicated.

Don't forget, every part of your test-setup must pass muster: Meter, Test Leads, Clip Leads, Tools. Given the right circumstances a battery can be turned into a very effective welder and a very slight current can kill if you jab yourself on a wire in a live circuit!

## Preaching to the Converted

the microphone is a voltage which varies over time. To convert this to a Digital Representation we use a device called an Analog-to-Digital Converter (ADC) which samples the voltage at fixed intervals — say 10 times a second — and outputs the value of each voltage sampled as a Binary Value — say 8 bits in length. For every second of signal transmitted the converter would emit a string of 80 bits (8 bits/voltage sample times 10 voltage samples/second). A full minute of signal would

require 4,800 bits of data.

On the other end of the circuit a Digital-to-Analog Converter (DAC) is used to convert the string of bits back to a series of discrete voltage values and also — depending on the complexity of the converter — to smooth the transitions between the values.

Here then is the first problem of making an Analog Signal usable in the Digital World: You must sample the Analog Signal often enough to get a reasonable representation of the signal and you must smooth the transitions neatly enough that the result does not sound “choppy”. To put this in perspective a visual example (analogy) is found when a movie is shown at too slow a speed and the eye begins to see the individual image frames flash by instead of the illusion of continuity presented by a higher rate when persistence of vision fuses the images together.

But here is the catch: If we sample the analog signal often enough to get a very smooth digital reconstruction we need to transfer many more bits than we need for a lower sample rate. On the other hand, too low a rate will result in a digital reconstruction that sounds “rough”. We will notice that pieces of information are missing. The sample rate chosen must be appropriate for the type of information transmitted.

Another aspect of sample rate is signal bandwidth. Remember, when we modulate a signal we require bandwidth to accommodate the information transmitted. Too great a Modulation Rate will cause a signal to “bleed” into adjacent channels (and may violate FCC Regulations).

And here is another factor: At each end of the Digital Circuit we need a Computer Processor to process the digital information. The programs used to process the information must be able to keep pace with the information that flows. If the processors are not fast enough (or if the programs are not efficient enough) information will be lost as well.

This has been a very high-level synopsis of the Analog-Digital-Analog Conversion Process. It gives a flavor for the processing involved and it should be a sufficient “taste” of the process to serve as an introduction to a more rigorous text. In tying this material together, keep in mind that the Digital Information must be formatted according to a defined Protocol for actual transmission. Likewise, the process described here is more applicable to Audio or Visual information. Text material would not require this level of conversion unless it was transmitted as a facsimile (Fax).

Another point to note is that it would be quite feasible to transmit Digital Analog (Voice or Image) and Digital Text simultaneously on the same Channel. It would only be necessary to define a Protocol that specified how the Computer Processor could distinguish between an Analog and a Text Block of information. The protocol could be something as simple as “*four hundred bytes (eight bit groups) of Analog are followed by one hundred bytes of Text*” or special “Patterns” in the Binary Stream could delimit the Analog and Text Blocks. An interesting benefit of intermixing Analog and Text is that the easier-to-process Text Blocks might allow more time for more sophisticated processing of the Analog Data.

Enough for now. Next time we look at Compression and Signal Processing.

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### **For the Boatanchor Enthusiast**

Scanning the list of League Publications in the back pages of *QST* we note ARRL Order Number 9183: *ARRL's Vintage Radio* (\$19.95). A copy has not crossed this desk yet, but you can be sure that your editor will be scanning the racks at the Hamfests this Summer to see if this volume shows up and if it lives up to its promise.

On the other hand, if one of our members has chanced across a copy, a few words of review would be most welcome....

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### **BARA Picnic**

Mark your calendars, this is an early reminder that our August General Meeting is the BARA Picnic and we will meet at the Ross Park Pavillion on 18 August for food, fun, and festivities. Festivities will begin at 5:30 and more information will follow in the August BARA Facts, but make your plans now because this is not an event to be missed!

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### **AA2AP, Esther Valky Scholarship**

The 2004 recipient of our Club Scholarship is Eric Weir, KC2JWP. Eric is a graduate of Maine-Endwell High School and will be attending Penn State. Congratulations Eric!

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### **Harmonic Generation**

We understand that Bob Bryla, WB3IOU, and his wife Heather brought home twins! Megan and Amanda were born on 5 July. Mother and Daughters are doing well watched over by Bob and his sons.

Club Officers and Committees			
President	Bob McCabe	KC2DSS	748-9808
Vice President	Ron Reagan	N2RWK	722-6790
Secretary	Allen Lutins	KC2KLC	729-4817
Treasurer	Paul Slocum	N2NCB	687-2057
Directors	Bob Handel	K2FU	693-4310
	Malcolm Heath	KC2EOV	753-7248
	Steve Orzelek	N2MSB	775-0281
	Mel Snitchler	WE2K	723-9612
W2OW Trustee	Frank Scoblick	N2HR	729-4249
Newsletter	Ed Plesnar	KB2SCF	754-3810

**BARA, The Binghamton Amateur Radio Association is**



**an ARRL Affiliated Club**

### ***Next General Meeting***

7:30 PM, Wednesday, July 21st Town of Binghamton Town Hall,

279 Park Avenue, South of the Ross Park Entrance

### ***Board Meeting***

7:00 PM, Wednesday August 4th

Broome Community College Campus, Office of Emergency Services (West Side of Campus)

### ***Exam Session***

Note: No Vestal Library Session this month

1:30 PM, Saturday August 14th

Endicott Fire Station, Across from UE High School

### ***BARA Dues***

\$18/year Single Member; \$27/year Family

### ***DX Cluster***

W2OW on 145.070 MHz with a Data Rate of 1,200 baud; questions to [n2bc@stny.rr.com](mailto:n2bc@stny.rr.com)

### ***W2OW Repeater***

147.390 MHz, 100 Hz CTSS. BRAT Net every Sunday Evening at 8:00 PM Local Time

*Binghamton Amateur Radio Association, Inc.*

*P.O. Box 853*

*Binghamton, New York 13902*

*First Class*

