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Stepping Forward, Holding Back

On Tuesday, 21 September the Town of Binghamton held a Public Hearing on the use of the Hance Road site by BARA. Over a dozen BARA Members were present for moral support and Jack, WB2GHH, was our main spokesman.

The meeting went surprisingly well considering the issues that were raised at the Informational Hearing and some of the new objections raised could be boiled down to "you changed your original plans to address our objections."

Let's be frank. There are several people who do not seem to want "Radio People" in the area and if we are honest with ourselves we need to accept that their worries are understandable, though perhaps unfounded. Like it or not, we Amateurs need to understand that people often have a pre-perception of Amateur Radio that can only be disarmed by careful diplomacy. Will that work in our situation? Time alone will tell, but the issue is not dead.

The main sticking point remains the Department of Environmental Conservation (DEC) and whether the DEC must pass judgement on our use of the property. A sub-issue of this matter is liability for any materials uncovered while excavating for foundations. Pending clarification on these issues from the DEC the Town or Binghamton has tabled our request and this is where the matter stands.

As a Club we should be grateful to Mel, WE2K; Bill, N2BC; Jack, WB2GHH; Bob, K2FU; Bob, KC2DSS; Paul, N2NCB; and others who worked to draft the presentation. Jack certainly put our best foot forward in presenting an overview of BARA, describing the use we would make of the property, and justification for why we make the request. Several of our members who addressed the meeting and responded to questions also did much to present BARA in a positive light.

Eyes open and look sharp: You never know who

Playing "The Game"

Just a few weeks ago I chanced to be browsing a book stall at a local "Antique Mall". There was an Electronic & Technical section, but aside from a few moldering volumes on TV Service, there was nothing of interest. Broadening my scope, I chanced on the Religion & Theology section and to the end of a row of dusty titles — tucked to the back of the shelf — I spotted a Third Edition of the *RCA Radiotron Handbook.* Paydirt! And as I made for the cashier with my treasure I began to wonder if perhaps I had made the winning move in another round "The Game."

You know "The Game", don't you? It is played in endless variations by collectors of various kinds of stuff. I know for a fact that Ham Radio operators play it with Particular zest because I have seen the evidence myself.

The rules are simple: If you find an article that ranks somewhere above *desirable,* but not quite at the *must have* level you make your move. Pick up the object and make a show of examining it, but casually, almost accidently, put it back in a *different place — a place where someone looking for that particular widget would never dream of looking.*

For example: Let's suppose you are in a second-hand shop and you happen across a nice pair or Baldwin Headphones (marked $2.75 when you are down to $1.50 in the wallet) among the broken transistor radios and defunct televisions. You look them over as if you might be interested in buying and then you take them with you. As you browse the rest of the store you happen by a rack of kitchen tools and you carefully examine a battered coffeepot. Now it's your move: Put the coffeepot back on the shelf *with the headphones behind it* and move on! Don't look back. If all goes well those "Baldies" will be there when you return — unless another player trumps your move.

the players are. If someone swings in behind and

follows, beware! It may be another player. I once had a fellow player stick to me like glue hoping that I might set down a Hallicrafters I had picked up at a flea market. His dance of anticipation gave him away and I made sure he never got the chance to claim my treasure!

Ham Radio Anthology
Test Equipment and Repair Techniques

Between 1968 and 1990 the magazine *Ham Radio* was one of the "Higher Class" magazines catering to Our Hobby. Although it was several years deceased when I got my ticket, copies still circulated and my Elmer (Nels, KA2ZLT) leant me an armload to get me started. Catering to the do-it-yourselfer, *Ham Radio* never seemed to aspire to the technical heights of *QST,* but it always promised interesting and thoughtful articles on practical subjects and it seemed a genuine "step above" most of the other journals.

Several years ago CQ Communications published the entire run or *Ham Radio* on CD-ROM (and at a fairly hefty price). More recently, they published several anthologies on various topics and the one on *Test Equipment and Repair Techniques* found its way into my hands very recently.

This reviewer likes the product very much indeed. Although the engineer might grumble that the content is not "state of the art", those who favor glowing bulbs and discrete components (with perhaps an occasional IC) will find themselves at home and the beginner will find down-to-earth and practical advice on (1) safe service and repair techniques; (2) the theory and practice of figuring out why it won't work; and (3) tools that might make the job easier. If you add to this list of "practicals" a smattering of useful Test Equipment projects the result is a text helpful to the newcomer, useful to the experienced, and warming for the nostalgic.

Test Equipment and Repair Techniques (ISBN 0-943016-26-6) is available for $19.95 direct from CQ Communications or through your local bookstore.

Silent Keys

It is always with sadness that we note the passing of fellow Hams and with regret we document the passing of Gary J. Murray, N2FON (on 3 October 2004) and Richard S. Mead, K2UNY (on 5 October 2004). We extend our condolences to the families of our Brother Amateurs and we thank Jack, WB2GHH, for bringing this item to our attention.

Note that the first row and the last are identical. If we

An Exclusive Club

Over the past few months we have belabored Digital Matters to some extent and it's about time to wrap things up. Coding Techniques give us a set of tools for converting between Analog and Digital Data and Communications Protocols define techniques for bringing order out of the chaos of ones and zeros. This month we look at Coding in a different way and how it might be used to obscure the Digital Message.

This type of coding has very little place in Amateur Radio and is forbidden except for the case of Telecommand of Amateur Satellites, however it is interesting in itself and so important to Communications Security in Internet, ATM, and other transactions that it is not out of place here.

Encryption (scrambling a message) and Decryption (reducing it to it its original sense) can be accomplished through many techniques. The most basic is to combine the message with an a key and to flip the ones and zeros according to a pre-defined rule.

The Key is a sequence of ones and zeros that is either truly random or "random enough" for the purposes of security. High-level government messages are encoded using truly random keys which is an expensive, but totally secure technique. Lower-level messages use keys that are generated from a "seed" (like a Password) and a mathematical function. Key Generation is a topic in its own right and for our purposes we simply state that the Key is a string of ones and zeros.

The Rule for combining the Key and the Message is a very simple one: We write out the Message with the Key lined up under the Message. We then combine Message and Key as follows: If we combine a *one and a one* or *a zero and a zero* the result is *zero;* otherwise the result is a *one.* In technical terms this rule is known as an Exclusive OR. In mathematical terms it is non-carrying binary arithmetic or addition modulo two.

Whatever we call it, the rule has a very special property: Repeating the operation again (combining the encoded message with the key) decodes the message. Here is an example:

Message (M): 1011 0010 1111 0000 1010
Key (K):   1011 1010 1010 0010 0010
M+K: 0000 1000 0101 0010 1000
M+K+K: 1011 0010 1111 0000 1010

transmitted the M+K Row then only someone who

knew the rules for generating the Key (or who had a copy of the Key) could easily recover (decode) the original message.

Now, to be practical, there are techniques for analyzing an encoded message and for "breaking" it either by analysis or by Brute Force (trying all possible keys). We won't concern ourselves with these techniques here, but we do note that the simple rule outlined can — with proper key generation protocols — be extremely secure.

We can add complexity (and security) to the rules by rearranging (permuting) the bits according to a defined rule (that can, itself, be based on a key). We need to be careful, though, because some changes can give a false sense of security and others might actually reduce the security. To give an example: Applying a second Key (and the Exclusive OR) to our example adds no additional security because it can be proven that there will always be a third Key that gives the Message in only one Decode Step.

There are a couple other details that become important when we Encode Messages: First, the Protocol for breaking the message into Blocks and Transmitting it must be strong (robust) enough to allow us to reconstruct a message even if some bits have been lost in transmission. At the very least, we must be able to determine that Bits have been lost so that we can request a re-transmission. Second, we can include Serialization Data within the Encoded Message. If each Message includes a Serial Number or if the Key Generation Rule includes a Serail Number we can have something like a "Digital Signature" that gives us greater assurance that the Message is real and that someone has not intercepted a message and replaced it with another. This last point is of particular importance if we are transmitting Banking or Credit Card Transactions.

Before concluding this very brief summary of a very complex and interesting subject it is worth noting that any Encoding Technique that relies on the secrecy of the Encoding or Decoding Rules is inherently insecure. This has been proven time and time again. The only "secret" part of the process is the Key. Secure Transmission and Exchange of Keys combined with a solid rule for generating the Encoding Key is the foundation of a Secure Encoded Communications Channel. This, by the way, is why your Bank or Credit Card Company can never give you a "forgotten" PIN Number: Their encoding process is set up so that (outside the printed slip sent to you) the PIN never exists in Decoded (Plaintext) form. Once set by the System or punched into an ATM Keypad the PIN is encoded and it only exists in this encoded form.

'Tis the Season

No, we are not dragging out Holiday Decorations and trying to squeeze a few extra weeks of merchandising out of the year; this is just a reminder (courtesy of Dorothy, K2YEH) that the Contest Season is upon us and that the few remaining fine days of Autumn and Indian Summer are a fine opportunity to get outside and adjust the Antenna and Ground Systems for optimum performance.

That feedline you bought twenty years ago might be getting a little "soft" and a call to your favorite supply house will have a replacement coil at hand in a very short time. Check the feedpoint at the antenna and run some SWR Curves to make sure that all looks well, but remember that too flat a curve might indicate an efficient Dummy Load at the top of the tower!

Don't neglect the station either. The Ham "Wish Books" are arriving in mailboxes daily. If you can't justify the outlay now, perhaps a gentle hint (or blatant suggestion) to the right person might assure your very own "Red Ryder" arrives with the Holiday Season!

Once everything is "Shipshape and Bristol Style" take a look at the Contest Calendar and plot your strategy. If you are not a Contester, give it some thought and consider branching out to a new area of Amateur Radio; if the "fire" of Amateur Radio has died down, this might just help to rekindle the flame!

Election Reminder

Election of Officers and Board Members will be conducted during The November General Meeting. If you are interested in serving, please contact Bob, KC2DSS, or Paul, N2NCB, to have your name placed on the Ballot. Nominations (including self-nominations) from the floor will also be accepted.

Christmas Party

Please mark your calendars for 15 December and plan to be at the 2004 BARA Christmas Party!

Hedy, AA2MU, has confirmed the date with Russell's and a menu and further details will be provided in the November *BARA Facts*. The Christmas Party is always fun and it is never complete without you, our comrades and fellow-travelers along the path of Amateur Radio. Please plan to join us for an evening of fun and festivity.

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, October 20th Town of Binghamton Town Hall, 279 Park Avenue, South of the Ross Park Entrance

Board Meeting
7:00 PM, Wednesday November 3rd
Broome Community College Campus, Office of Emergency Services (West Side of Campus)

Exam Session
7:00 PM Monday, October 25th
Vestal Public Library, Route 434 Vestal
1:30 PM, Saturday November 13th
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

W2OW Repeater
147.390 MHz, 100 Hz CTSS. BRAT Net every Sunday Evening at 8:00 PM Local Time

Binghamton Amateur Radio Association, Inc.
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First Class