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# **BARA** Facts

*Newsletter of the Binghamton Amateur Radio Association*

**October 2003**

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

## **Important News: Upcoming Change in BARA Meeting Location**

The Unitarian Universalist Congregation has notified all organizations using its facilities of a new fee schedule that is now in effect. According to a letter we received from the church BARA will be expected to pay \$30.00 per meeting to cover the use of the facilities. After some discussion at the September Board Meeting the Officers and Board concluded that this expense is not tenable and we have begun the search for a new meeting location.

We expect to remain at the church through the remainder of the year as our budget already includes \$100.00 for a donation to the church for the use of the facilities. Previously we had made this donation each January as a mark of our appreciation and goodwill, however we will now apply it to the cost of the room for September, October, and November (which we expect to be our last meeting at the church). December is, of course, our Christmas Party and we do not require the room for that meeting.

Thanks are due to Jack, WB2GHH, and Mel, WE2K, for suggesting several alternate locations. Mel, in particular, is negotiating with the responsible parties for a convenient and reasonable facility.

## **Calling All Candidates**

Several of our members have stated their willingness to place their names on the slate of Officers and Directors for 2004. If you are willing to serve Our Club in this capacity, please contact Jack, WB2GHH, as soon as possible to have your name included on the ballot. The election will be held at the November General Meeting.

Remember, BARA is *your* club and we want to hear. At some point in our careers as Hams we are likely to hear cries of protest as our signals "get into" stereos, televisions, telephones, and other assorted electronic gizmos. Demonstrating that the problem lies in a poorly designed and cheaply manufactured device and

*your* voice as we set a Club Direction for 2004. Service as an Officer or on the Board is a positive and much appreciated contribution by ***Our Members to Our Club.***

## **September Meeting Recap**

The turnout for our September meeting was pretty good despite the fact that Isabel was getting ready to knock on the door. There were not many entries in our "Junkyard Wars" contest so the program settled down to "Show and Tell" and a raffle.

Malcolm, KC2EOV, brought in a very nice Solar Cell Battery Charger that he purchased through Cabella's Outfitters. The charger is about the size of a DVD Case and encases the solar cell in heavy plastic so that the entire unit is waterproof. There is a pivoting stand so that you can mount the unit and direct the cell towards the sun and a two conductor wire terminated with alligator clips provides the connections. Malcolm said that the unit is actually manufactured for keeping "Game Feeders" running in the wild, but that it could be used to keep 12-Volt Gel Cells charged. A 6-Volt model is also available and the device could be useful for campers, hilltoppers, and QRP operators.

Ed, KB2SCF, had a 1-Tube Regenerative Receiver that he built using a combination of home-made and manufactured parts. He gave an outline of the history and operation of the regenerative circuit and some of the pitfalls of the simple designs used in the 1920's.

After the presentations there was a surprise raffle of a 1947 ARRL *Handbook*. Bill, K2MFB, was the lucky winner. He said that the book will find a place on his shelf next to his own 1949 edition.

## **RF Interference Resources**

quoting chapter and verso of the FCC *Regs* may work in some cases, but it gains very little ground if the aggravated party lives in the same house and is related by blood or marriage (or perhaps is after blood). In many cases the "unintended operation" is caused by

some part of consumer equipment or electrical wiring acting as an Antenna and rectification by a poor contact or actual component can resolve the audio portion of a signal.

Sometimes a fix can be accomplished by choking the signal with Ferrite Cores or filtering. RF Bypass Capacitors may also help, but these should be used with care in Speaker Systems. The reality is that sometimes these problems elude conventional solutions and they can only be attacked by a combination of inspired guesswork and luck. Books are available with suggestions and troubleshooting techniques, but sometimes more immediate help is needed. Here are a couple of Internet Resources that may be helpful:

Out in the "Windy City" Mike Sandman <<[www.sandman.com](http://www.sandman.com)>> makes a business selling an extensive line of telephony tools and products. His Web Page includes links to a number of technical articles and two in particular may be of interest to Hams. An outline of the technical issues in tracking down various types of RF Interference can be found at <<[www.sandman.com/rfbull.html](http://www.sandman.com/rfbull.html)>> and a neat troubleshooting flowchart is included at <<<http://www.sandman.com/rfelim1.gif>>>.

Grounding is one of the major culprits in RF as well as Power Line Interference cases and Grounding Problems can be notoriously hard to track down. The Music Department of The University of California at Santa Cruz has a very nice series of essays on Technical Topics. One, located at <<[arts.ucsc.edu/EMS/Music/tech\\_background/TE-15/teces\\_15.html](http://arts.ucsc.edu/EMS/Music/tech_background/TE-15/teces_15.html)>>, includes links to essays on Electronics and Grounding that are quite informative and point out some surprising sources for "hum".

In any event a careful analysis of the systems involved is the proper place to start. Remember, conductors that are well-behaved when passing D.C. or A.C. at 60 Hertz may behave in seemingly strange ways at RF Frequencies. Inductance and Capacitance may appear in the most unexpected guises and raise mischief for the innocent Ham.

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### **Review: Low Power Scrapbook**

Operating at Low Power Levels poses an attractive challenge to many in our Hobby and by some accounts

So, where does this leave us? The matter really comes down to one of insight *vs.* answers: Measurements provide insight into the behavior of the Antenna System. Accumulating accurate and relevant data permits us to make inferences about the components that make up the system and the behavior

QRP Operating is one of the growing subdivisions in our ranks. Great Britain is a hotbed of QRP activity and the RSGB (Radio Society of Great Britain) has reprinted a number of articles on QRP operating as the ***Low Power Scrapbook***.

If you have been bitten by the Flea Power Bug yourself or if you are just looking for ideas for a transmitter or receiver project, you are likely to find something of interest somewhere in these 320 pages of Antennas, Metering Equipment, Transmitters, Receivers — you name it — the gamut of Amateur Radio is covered with imagination and creativity. This book might just be the inspiration for your winter projects.

The *Low Power Scrapbook* (ISBN 1-872309-73-9) is published by the RSGB and is available through the ARRL and similar outlets. Price varies by outlet, but is in the neighborhood of \$20.00.

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### **Comments on a Practical Example**

Bill, N2BC, was kind enough to point out an important omission in the analysis of my 2-Meter Antenna System for the September Newsletter. He noted my statement suggesting that measurement of the SWR at the Antenna Feedpoint is of greater value than the SWR value at the Transmitter and in doing this he made several valuable points that should be elaborated here.

In the case where an Antenna is fed by a Transmission Line that matches the Output Impedance of the Transmitter (and the SWR Meter is designed for readings at that Impedance) an SWR Measurement at the Antenna does give a true picture of the Antenna/Feedline Match. However, if the match is not perfect (remember, the Antenna will generally be resonant only for a particular band of frequencies) and if the the Feedline is not an exact multiple of a half-wavelength at the operating frequency then the Feedline will act as an Impedance Transformer and the SWR at the Transmitter will be different than the SWR at the Antenna Feedpoint.

Is the difference important? It may be. If the transmitter includes circuitry that reduces output power in the presence of excessive SWR then the impedance transformation provided by the Feedline may result in slightly more (or less!) Power being provided by the transmitter.

of the system as a whole, but the answers only come through careful analysis that includes all relevant features of the equipment and intelligent interpretation of the data.

In the end, though, the proof is always in the pudding: How does the system work under real

operational conditions? If we are able to communicate reliably then the system is good. This is the difference between theoretical and practical engineering and being able to make the distinction is critical not only in our hobby, but in the real world as well. Military, Government, and Commercial services know this and striking a reasonable balance is what leads them to use what might be considered a poor compromise for an antenna and high power levels when great frequency agility is required. For us as Hams we may choose to optimize operation for certain frequencies and so the conclusions we reach and the systems we design may have a very different flavor. — *Thanks to Bill, N2BC, for the insights presented here.*

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### **Straight Dope on Capacitor Soak**

A recent article in *QST* had a number of helpful suggestions on Amplifier Maintenance, but one point that was *not* mentioned is worth noting.

Any circuit involving Capacitors of any great capacity deserves careful and respectful handling during adjustment and service. Even if Line Voltages are disconnected, these components can retain sufficient charge to pack a real wallop. Many Amateurs are aware that although the charge dissipates over time, such Capacitors should be carefully discharged with a Shorting Stick before equipment service or adjustment begins. Careful Discharge is a must even if Bleeder Resistors are included in the circuit because Bleeders have been known to fail open and even functioning Bleeders still take time to drain off the stored charge.

But a single discharge is not always enough. A unexpected but very real phenomena called *Dielectric Absorption* — more commonly *Soakage* — will sometimes permit a discharged Capacitor to build up a second (or subsequent) charge *after initial discharge*. As a precaution, it is well to leave the Shorting Stick in contact with the Capacitor Terminals for some seconds after the initial discharge and to short the Capacitor again after opening the circuit and permitting it to “recover”.

Not all Capacitors exhibit this behavior (which appears to be related to particular dielectrics as well as to certain manufacturing procedures or inferior materials), but when they do the result can be an unexpected shock. In addition, even low-value Capacitors used in critical Sample/Hold or Filter Circuits can cause erratic and unexpected behavior if the “Soak” is too great. This is a fact to be aware of if you happen to be repairing a piece of equipment and replacing a Capacitor makes things worse. As a rule of

thumb you might make a practice of using the same type of Capacitor when replacing parts. It is also useful to know that polypropylene is a low-soakage dielectric.

Bob Pease (of National Semiconductor) wrote an informative article — *Understand Capacitor Soakage to Optimize Analog Systems* — in 1982 and we understand that his paper remains one of the few and one of the best resources on this subject. Bob’s paper is available on the Internet at <<<http://www.national.com/rap/Application/0,1570,28,00.html>>>. While you are there, you might browse some of Bob’s other columns. He writes with clarity, humor, and authority and there is a lot to learn and a lot to enjoy in his material.

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### **VHF Net Activity**

Through Jim, W2JGO, we learn of several VHF Nets. One, on 6-Meters, is local and sponsored by the RKRC each Monday Night at 7:00 PM on 50.140 MHz, USB. We understand that Net Control switches between Horizontal and Vertical Polarization during the Net, so there is a chance to get in even if you have a less than optimum Antenna Setup.

Jim also notes that on Mondays at 7:30 PM a net originating in Vineland, NJ comes up on 50.150 USB. At 8:00 PM a 2-Meter Net may sometimes be heard at 144.150, USB.

If you have been wanting to get in on 2- or 6-Meter SSB activity, you might try checking into some of these Nets.

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### **CHOW/CROP Walk**

Communicators are needed on Sunday, 19 October for the annual CHOW/CROP Walk in Endicott. If you are available to assist with communications for this event, please contact Ford Drake, AB2HS, by phone or by giving him a call on the 146.82 machine.

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### **Correction**

In the *Hats Off* article last month I should have stated that the Cornell Center for Materials Research obtained the National Science Foundation Grant and is the main partner in all activities. TCARC and the Sciencenter provide support and volunteers for some of the presentations, but are not the overall organizers. I apologize for any confusion in this matter.

Club Officers and Committees			
President	Bob McCabe	KC2DSS	748-9808
Vice President	Jack Connors	WB2GHH	724-8822
Secretary	Ron Reagan	N2RWK	722-6790
Treasurer	Paul Slocum	N2NCB	687-2057
Directors	Bob Handel	K2FU	693-4310
	Steve Orzelek	N2MSB	775-0281
	Ed Plesnar	KB2SCF	754-3810
	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 15th Unitarian Universalist Church Riverside Drive, Binghamton, Next to Lourdes Hospital

### ***Board Meeting***

7:00 PM, Wednesday November 5th

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

### ***Exam Session***

7:00 PM Monday, October 27th Vestal Public Library, Route 434 Vestal

1:30 PM, Saturday November 8th

Endicott Fire Station, Across from UE High School

### ***BARA Dues***

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