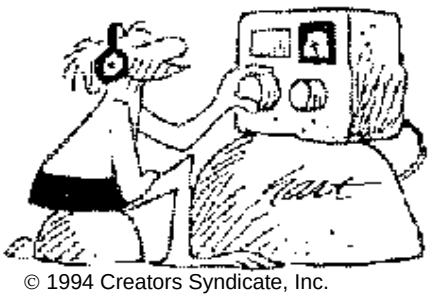
October, 99

BARA FACTS

Binghamton Amateur Radio Association, Inc.
PO Box 853
Binghamton, NY 13902

Established 1919



W2OW Fred W. Porterfield Memorial Station
W2OW Repeater 147.39/.99

Check out BARA on the web!
http://www.wtsn.binghamton.edu/bara/

WAITING FOR A SIGNAL

Well, September is here and we still have no word from the FCC on Amateur Radio License Restructuring. There seem to be several reasons including a move to new offices, the number of comments from the Amateur Radio Community, and the need to "get things right". At the same time other countries are changing their License Requirements and the world of Amateur Radio seems to be changing pretty drastically as the Sunspot Cycle picks up and we move towards the next millennium.

Well, change is certain in just about everything and our hobby is no exception. We have survived attacks on our bands and our existence and we have survived some pretty bitter infighting too: Spark and CW slugged it out after World War I and there always seems to have been tension between 'Phone and CW. And let's not forget that Sideband and AM once (and even still) regarded each other with less than fraternal affection.

Yes, it's a great hobby. There's something in it for everyone and enough passion and excitement to fill plenty of airtime and for which to spill an ocean of ink. But despite it all, there's still the magic of communicating -- be it down the block or half a world away -- the magic of that signal that brings us friendship, news or companionship. That's the bond that cuts across license class and operating mode. It's a bond that we all share and a bond that -- like it or not -- gives us a common identity.

So we will wait, and we will debate. But we will always be -- Hams.

No, that's not it. A few words more...

Thanks to all who made our picnic a success. Bob, WS2U, did a fine job planning and arranging and supplying things. Tom, W2TRT, made sure that the drinks were there. Bill, N2BC, and Bob, WS2U, did some final trimming and landscape work to make sure the jungle did not overtake us. Rich, N2MGM, and Ron, N2RWK, kept the fires burning and cooked the 'eats to perfection. The pinata that Hedy, AA2MU, sent provided entertainment for the kids. Now, I'm sure I probably forgot someone, and I'm sorry if I have, but lots of people helped and lots of fun was had. THANK YOU EVERYONE!

And don't forget "Kid's Night" this month.

73, DE ED, KB2SCF

UPCOMING PROGRAMS

OCTOBER: Show and Tell Night. No formal program, just a chance to swap tales, tell lies, and show off the masterpieces and treasures you have accumulated over the last year (or so).

NOVEMBER: Mystery Program. That means we haven't worked one out yet, so contact Ed, KB2SCF, with ideas and suggestions!

DECEMBER: The Annual Christmas Party and Election of Officers!

KIDS NIGHT – SEPTEMBER PROGRAM

The September BARA meeting is our third annual "Kid's Night". We will be showing "The New World of Amateur Radio" and will set up displays to show the history and the fun of Amateur Radio. In the past these displays have been spark gap transmitters, code keyers, posters and radios.

The thing that really makes Kid's Night special is kids. Be sure to bring as many kids as you can fit into your car (just kidding). The more kids and the more people to talk to them the better. We will have pizza and soda in addition to our usual coffee and doughnuts. If you have any radios, displays, experiments, or whatever that you think the kids might be interested in, please bring them along.

Our definition of kid is anyone old enough to be interested in radio as a hobby, there is no upper age limit on being a kid as far as I can tell. I hope to see a lot of folks there, I think reaching new people with Amateur Radio may be one of our most worthwhile activities .

de Bob WS2U.

INFORMATION AGE POEM

My New Spell Checker

Eye halve a spelling checker
It came with my pea sea
It plainly marque four my revue
Miss steaks eye kin knot sea.
Eye strike a key and type a word
And weight four it two say
Whether eye am wrong oar write
It shows me strait a weigh.

As soon as a mist ache is maid
It nose bee fore two long
And eye can put the error rite
Its rare lea ever wrong.
Eye have run this poem threw it
I am shore your pleased to no
Its letter perfect awl the weigh
My checker tolled me sew.

--Sauce Unknown

TEKNICAL TIDBITS

The following description of the characteristics of various type of capacitors is from Roberta Barmore, KB9GKX. Bobbi is a frequent contributor to various internet forums. The discussion which prompted Bobbi's post was regarding the replacement of aging capacitors in vintage equipment – enjoy:

Condensers are marvelous devices, and one of the oldest passive components in the art. However, taken as a group they are one of the *most* non-ideal components there is! That's as in "Platonic ideal," for the philosophy majors, and what it means is, real condensers in the the real world do not behave in the precise manner of their mathematical and/or handwaving analysis models. Therefore when you or I go to replace old types with nifty-keen brand-new ones, we are likely to find ourselves encountering unexpected results. Here's a little peek into the World of Condensers:

Tip One: Old waxed-paper & foil condensers are usually marked to indicate the outside foil, which should be connected to the earthiest point. These critters can exhibit significant inductance (depending on internal construction, especially the method of attaching leads) as they are, viewed end-on, a big old spiral of conductors; the dielectric losses can be on the high side *and* *variable* thanks to the waxed paper & its hygroscopic and "hook" effects, and this can have the effect of introducing significant and possibly non-linear series resistance. Sometimes that's okay; more often, it'll bite you when you are not looking. They are known to have a limited useful life.

Tip Two: Electrolytic condensers can *also* exhibit significant inductance (see above), high-ish equivalent series resistance (gets too high, they're goners), and, due to the nature of the film & its forming action, will always show some parallel or "leakage" resistance. Very handy if you need a lot of C in small space *and* you are not so much bothered by poor performance at higher frequencies. Excellent in power supplies, a bit iffy with audio; study your application carefully with an eye to the known flaws.

Tip Three: Tantalum condensers are physically smaller than 'lytics for a given electrical size (but likewise polarized) and will therefore be less inductive, have lower leakage, etc. Not bad for audio. Early tantalums were failure-prone; when you stuff lots of C into a small space you pay a price, in cash and in figuring out the how of it. Modern ones are pretty good; for audio apps needing high capacity and in which there'll be some DC to keep the electrochemical activity happy, they are a good choice.

Tip Four: Ceramic-disc and ceramic-fil/monolithic condensers come in many flavors. Some are tastier than others! The smallest, cheapest types use tricky ferroelectric ceramic formulations in a deliberate price/performance/size tradeoff; X7R, Y5V, Z5U are typical examples, all of slightly differing characteristics. In general, these low-end versions will show variation in dielectric constant with temperature, applied AC and DC voltages & AC current, and possibly phase of the moon. At audio, they will introduce *measureable* amounts of distortion. They're handy for many bypassing applications. NP0 ceramics are another story. Usually larger and more expensive than their cousins, they've got plain old, just-lays-there-and-insulates ceramic dielectric, allee same as your Wedgewood Steatite dinner service for seven, and are

useful just about anywhere. You'll pay more for them. My own preference is for monlithic packages over the disc type--the monos are a little more rugged physically. Axial-lead, glass-encapsulated monos are among the best, but hard to find; "dipped" radial-lead monos are common.

Tip five: Polyestrene-film condensers are nice, stable little jobs made out of what looks like Saran-wrap and tinfoil. Performance is at least as good as NP0s and the better micas, though a tiny gotcha lurks in the rolled construction, which depending on internal connection methodology can introduce some inductance. But it is much less than in wax condensers thanks to the higher dielectric constant of the plastic. Drawbacks, you can melt 'em with speed and ease when soldering in, and the plastic does not tolerate most flux-removers well. Larger values (1000pF and up) are costly, and should be reserved for critical applications.

Tip six: Mica condensers are an old standby. Usually a "stacked" construction, they have good performance at RF though can be cooked by excessive AC current (and will act very funky long before the smoke comes out). Long-term, they can suffer interesting failure modes, most typically the growth of metal-crystal "whiskers" into the mica, and this can cause breakdown. Well-sealed micas are fairly immune to this, but it's something to watch out for.

Tip seven: Modern polypropalene and polyethylene condensers are a good replacement for the old wax one. Generally well-behaved through MF and may be available in both stacked and rolled versions.

Tip eight: Mylar condensers are also good replacements for old wax. Rolled mylar-film condensers even *look* about the same (and will generally be marked to indicate the outside foil, etc.) Electrical properties similar to the poly caps in tip six. Usual rolled-construction caveats apply, though the free-bonus L will be lower than a wax condenser of the same electrical size, mylar having a better dielectric constant than old candles and less surface area for the plates being thereby required.

Tip nine: Alas, the wonderful air-dielectric variable condenser can have problems, too. Known nasties, in no particular order, are excessively resistive shafts & wipers; frames that constitute a partial-turn inductor; lousy dielectric material, and too much dielectric *other* than air in the electrical field. Look for good, solidly-built condensers with isolantite/ceramic insulation, and for really critical uses, keep an eye out for the old Nationals with insulated bearings.

Tip ten: Solid-dielectric variable condensers are simply not that good. Too many compromises. Wonderful things in a pocket MW receiver, otherwise yeech. This does *not* include the good little mica trimmers, which are pretty handy and excellent in set-and-forget applications.

Tip eleven: Vacuum condensers are about as close to the textbook, ideal model as can be had. They cost like it, too. But when you need a really high voltage rating, good RF-current rating, and high stability, they're the only choice. *Variable* vacuum condensers have a little bellows structure that allows the piston to move without breeching the seal, which will eventually fail and can be broken by excessive motion. (Most tpes incorporate a screw-on shaft that unscrews *before* you've overflexed the bellows). You *can* cook them with excessive RF current; I have a fine collection of 15pf "dead soldiers" from the output network of an RCA TV transmitter as evidence.

Last thought: with *any* condenser, you can make up a fine little VHF/UHF series-resonant circuit with excess lead length. As a general rule, the shorter the better!

And there's just almost everything I know about condensers, off the top of my head.

73,--Bobbi KB9GKX

PHEW! Managed to juggle things and get it all to fit. Many thanks to KB2SCF, KA2CNG, WS2U, and our guest author KB9GKX – ed (actually it's Bill your EDitor)