



THE COMPASS

Official Newsletter of the Great South Bay Amateur Radio Club

February 2015

Volume 43

Issue #2

Upcoming Club Events

Next General Meeting:

**Thursday, Feb. 26th,
8 PM at the EOC**

Note: There will be a vote at Feb.'s meeting to amend the club's Constitution and By-Laws. Please try to attend this month's meeting.

Afterward there will be a talk on DSTAR by Pres, W2PW

**Our First Upcoming Special Events for 2015:
MS Walk @ Belmont State Park**

GSBARC's FREE license classes are on Tuesday evenings from 7:30 to 9:30 PM. The Amateur Extra Classes are currently running.

Visit us on Facebook at www.facebook.com/gsbarc




Have You Paid Your 2015 Dues Yet?

Dues are due by the end of February or you will be removed from the club roster. Pay at any meeting or open house, or via PayPal on the club's Website

FCC "Paperless" Amateur Radio License Policy Goes into Effect on February 17

Starting February 17, the FCC no longer will routinely issue paper license documents to Amateur Radio applicants and licensees. The Commission has maintained for some time now that the official Amateur Radio license authorization is the electronic record that exists in its Universal Licensing System (ULS), although the FCC has continued to print and mail hard copy licenses. In mid-December the FCC adopted final procedures to provide access to official electronic authorizations, as proposed in WT Docket 14-161 as part of its "process reform" initiatives.

Under the new procedures, licensees will access their current official authorization ("Active" status only) via the ULS License Manager. The FCC will continue to provide paper license documents to all licensees who notify the Commission that they prefer to receive one. Licensees also will be able to print out an official authorization — as well as an unofficial "reference copy" — from the ULS License Manager. 

Inside this issue of The Compass...

- **Emergency Power**
- **Invisible People**
- **RC & LR Time Constants**
- **KB6NU's Guest Column**
- **Tip for LoTW Setup**
- **New Air Mobile Operator at 2014 HFW Run**

Upcoming Special Events

**MS Walk @ Belmont State Park
May 3rd**

**Air Power Museum
May 16th & 17th**

**Field Day
June 27th & 28th**

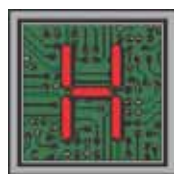
**Maggie Fisher Cross Bay Swim
July 17th**

**Fire Island Lighthouse
August 15th & 16th**

**Babylon Village Fair
September 13th**

**Hope for the Warriors Run
November 7th (Sat)**

President's Message



ere I sit 8 days after having knee surgery which also means 8 days of not being able to get down to my shack to play radio. All went well with the surgery but combined with all the ice and snow on the ground it caused me to have to miss January's general meeting. Thank you to everyone that called to wish me well and to those who sent cards and wished me well on the air.

I would like to thank Bob, K2TV, for running the meeting for me in my absence. I heard he did a great job as always.

In club business, we have been very busy making sure we get the budget in place for 2015. I am pleased to say it is done thanks to hard work of our new treasurer Bob, W2YW.

I would like to remind everyone that if you have not paid your 2015 dues as of yet please make sure you do. The club has many expenses which are funded by membership dues. Some you may not be aware of this, but last year we had a number of donations made to the club to help finance some of the club's projects. We also have many expenses related to repeater maintenance and repair.

Since the New Year the weather sure has been cold! So I guess it was good time to have my knee surgery and have to stay indoors. Just the other day Kevin, AB2ZI, came over and we played with meters and an oscilloscope. I am sure there will be an article on the Rigol oscilloscopes that Kevin and I recently acquired for a great price.

February's general meeting is going to be an important one and we need a good turn out as we will be voting on a proposed amendment to our constitution and by-laws.

Also at February's meeting, in addition to our regular 50/50 drawing, there will be a number of door prizes given away as well.

Our guest speaker will be Press, W2PW, who will be giving his famous talk on DSTAR. If you've ever considered getting into DSTAR or just want to learn about it, you won't want to miss this month's meeting!

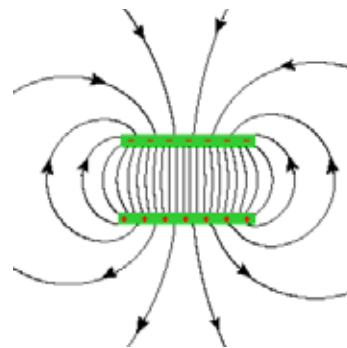
Getting back to the topic of cold outdoor temperatures, I can't think of anything better to be doing then getting on the radio to chase some DX. I know the pile-ups have been horrendous, just be patient, listen carefully to the station calling CQ, and if they are working a split make sure you call on the right frequency.

I hope to see you all at the general meeting on February 26th.

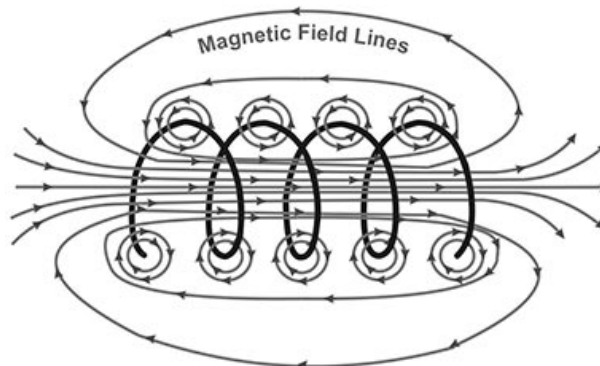
73. John Melfi, W2HCB ☺

In the Classroom, cont'd from page 2...

Calculating discharge values is almost the same; we just don't subtract the logarithm from 1. So we multiply the charged voltage by e^{-t} . So for our capacitor charged to 110 V, at 1 time constant it's discharged value would be: $110 \text{ times } e^{-1} = 110 \times 0.368 = 40.48 \text{ V}$ after discharging for 1 time constant. ☺



Electrostatic Field of a Capacitor



Magnetic Field of an Inductor

In the Classroom with AB2ZI

Time Constants in RC and RL Circuits

by Kevin Morgan, AB2ZI



capacitors and inductors don't behave like resistors. When a voltage is applied to an inductor or a capacitor, depending on which one, there is a phase shift of 90 degrees between the applied voltage and current. This is called reactance: Reactance (X) is referred to as impedance and is measured in Ohms. Impedance is really nothing more than AC resistance, but with a twist.

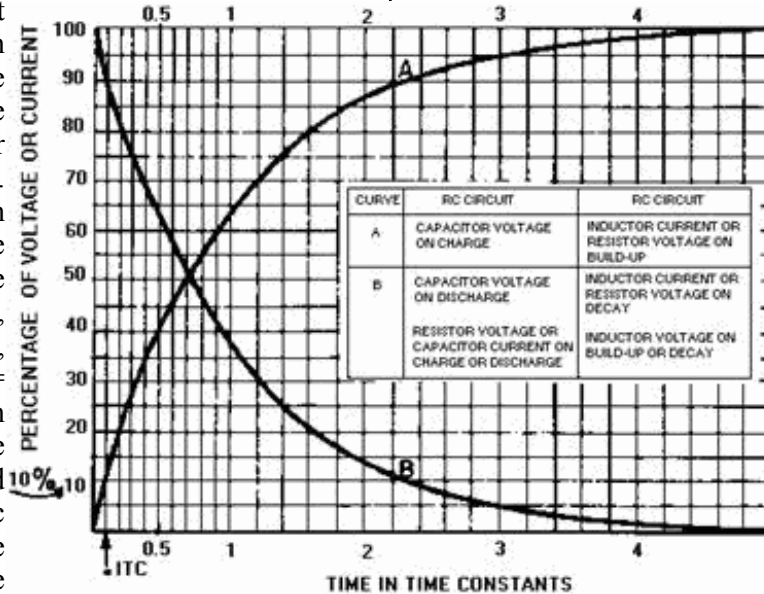
Let's first take a look at capacitors: We'll be using an applied DC voltage for these examples. When the voltage is first applied to the capacitor it looks like a short circuit. Current flows at its maximum rate into the capacitor but there is little or no immediate voltage developed. This is because, there being near zero resistance, Ohm's law shows that since $E = I \times R$, $I \times 0 = 0$ V. This condition doesn't last for long. As the capacitor starts to charge and stores energy in an electrostatic field between its plates the internal impedance (Z) of the capacitor begins increasing and so the voltage across the capacitor also increases (we can substitute Z for R in Ohm's law: $E = I \times Z$). At the same time current flow is decreasing. $I = E / Z$, so as Z increases current is decreasing. Remember that with fractions a larger number on the bottom (the denominator) means a smaller number, e.g. $1/4$ is larger than $1/8$.

Inductors work the same way but the current and voltage are opposite. As current is first applied to an inductor the expanding magnetic field crossing the turns of wire induce a current flow in the opposite direction. This is called a counter

electromotive force (counter EMF). This opposing current is seen as a large impedance, effectively an open circuit (initially). Using Ohm's law once more we see that since $I = E / Z$, if Z is very large or infinite, I will be near zero. Voltage (E), on the other hand, will be at maximum ($E = I \times Z$). As the magnetic field continues to expand it cuts through less and less of the windings (remember this is a DC current being applied) resulting in less and less counter EMF. Current is able to increase as the impedance (Z) due to the counter EMF decreases (e.g. $1/100$ to $1/10$ to $1/2$, etc.) which also has the effect of voltage across the inductor decreasing. With Z decreasing eventually to a short circuit current is at maximum and there is effectively no voltage drop across the inductor any more.

The rate of charge, voltage for a capacitor, current for an inductor, is based on the natural logarithm e (equal to 2.718281828...) which is the e^x key on scientific calculators and is measured in units based on the circuit's time constant, the symbol for which is the Greek letter tau, the symbol for which is τ .

It takes a total of 5 time constants to charge or discharge a capacitor or inductor. It doesn't matter whether the time constants are a millisecond or an hour. Time constants for capacitors are calculated by $R \times C$, that is, resistance times capacitance. For an inductor it's L / R (inductance divided by resistance). After each time constant the voltage or current values are the same percentage. One charge time constant is equal to 63.2 percent of the applied voltage or current. One discharge time constant is equal to 36.8 percent of the charged value.



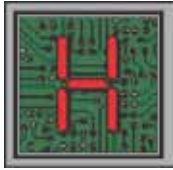
Looking at a capacitor, to calculate the voltage at any given time constant we use the formula $E (1 - e^{-\tau})$. This means we multiply the applied voltage (E) by 1 minus the natural logarithm e raised to the negative tau, tau just being the number 1 through 5 (negative in this case). So 110 V at 1 time constant would be: $110 \times (1 - e^{-1})$

On a scientific calculator, like the TI-30Xa, we enter the part in the parenthesis first, so 1 minus -, press the 2ND then LN key to access the ex function, we now see 0.368, press enter to subtract this from the 1 gives us 0.632, now multiply that by the 110 V and we get 69.5 V at one time constant. If the time constant were 10 seconds, then at 10 seconds after applying 110 V to this capacitor it would be charged to 69.5 V.

Continued on page 2...

Emergency Power

by John Melfi, W2HCB



As you can recall a while ago I did an article about my battery backup system for my VHF UHF equipment I had a west Mountain PWRGATE 40 which worked well but I was looking for something that would give both voltage and charging rate information without the need for an external meter. I found what I needed when a group of us were at the ARRL convention last year. While walking around I got to talking to representative from HamSource and I got to see this system in action. As you can probably guess I bought one to bring home with me. Not hard to install at all, very well labeled and a high quality charging circuit that works very well.



I am not bashing the West Mountain unit I own, I just wanted to be able to see more information about what was actually going on with my batteries. The charging rate is set by the fuse configuration. No fuse is a 1 amp rate, the fuse in the left socket sets a 4 amp rate, in the right socket you get 7 amps and with a fuse in both sockets a full 10 amp rate is activated.

What it allows you to do is continue operating seamlessly in the event of a power failure. As soon as power goes out it switches to batteries without a blink or loss of power at all, a completely seamless transition to batteries.

My shack is wired to an auto-start generator but when the power goes out the systems waits about 2 minutes before closing the auto transfer switch to guard against a false alarm.

Also, quite a few people have asked me which batteries I use in my standby system. I use two Deka Dominator Model 8G31DTM Marine Gel batteries. These are 12 volt batteries rated for 98AH for 20Hours.

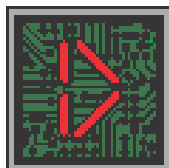


I randomly run under battery power on Monday night nets just to cycle my batteries. These batteries are spill proof sealed Gel batteries completely maintenance free and are designed for Deep Cycle continuous discharge/recharge service and float type applications.

I think that every amateur radio station should have some type of emergency power for their radios especially if you plan on being able to communicate when we lose power. There is nothing worse than being in the middle of an important message when the power goes out and your radio goes dark. What good is that great radio and antenna if you have no power? When you think about it this is a no-brainer and something we should all be thinking about in order to be prepared for a worst case scenario. ☺

The Invisible People

by John Smale, K2IZ



uring my recent vacation at Disney World I had to rent a battery powered scooter. This was because both of my knees are in bad shape. My knees were deformed from rickets and now, in my later years, they have developed osteoarthritis. The pain is quite bad and I am scheduled to have the left knee replaced in a few weeks followed by the right one later this year. I am able to ride a bicycle with no problems, the circular motion doesn't hurt, but walking hurts and so I can't walk very far. This being the case, rather than spending the entire time in our room, my wife and I rented scooters.

I need to explain another thing; I went through my growth spurt at around age 18, ending up 6'7" tall. I have always been the tallest person in any group, and I've endured all of the tall jokes.

I've also been guilty of poking fun at short people with comments like "the air up here is much cleaner and purer than down near the ground" etc. I've also seen the posts on a lot of amateur radio sites about people complaining about the fat obnoxious people in wheel chairs and scooters at various ham radio events.

Well, I'm here to tell you about my experience as someone having to ride in a wheel chair or scooter. In one week I found that I was invisible; I was the monkey wrench thrown into normal peoples structured lives, creating problems for them.

One example was a wife cut right in front of me, she never saw me, stopped to talk with her husband who was right in front of me and I bumped into her. I just couldn't stop in

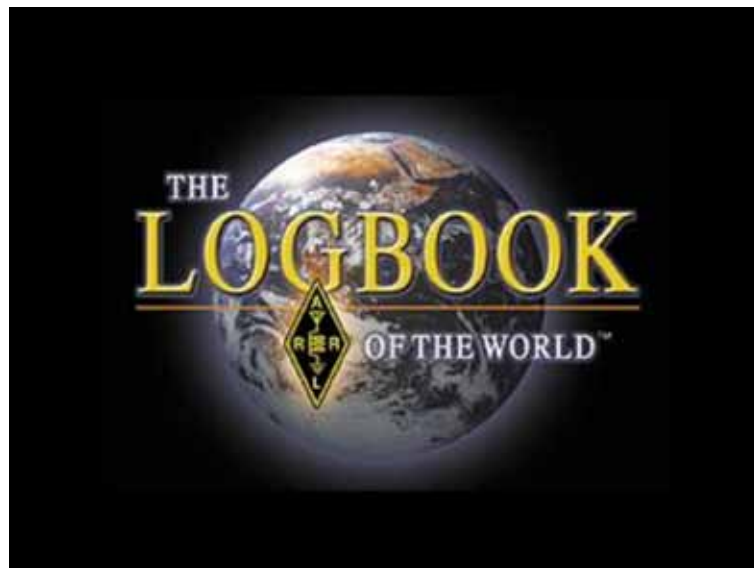
time. I said I was sorry, but the husband started making a few comments, at which point I stood up from the scooter. Now I was taller than he was, he was about 6'4", and I said "look, I said I was sorry, but your wife stepped right in front of me and stopped, she never looked to see if I was there". That quieted him down right away, and we went our separate ways, but I couldn't help but think about the people that aren't able to get up like that.

After a couple of days of this I was starting to develop an attitude. I'd be watching something where I couldn't get the scooter up to the front and someone would walk over and stand right in front of me totally blocking my view. It was after I'd say "excuse me" that they'd realize that I was there—I was invisible.

Several years ago I had spent a week at a Boy Scout Summer Camp. They had a separate campsite set up for handicapped scouts and all of the young men were required to spend some time in that camp to see what it was like for those that couldn't run, jump or climb like they could. Quite a learning experience.

This vacation was an eye opener for me, I have always tried to be aware of my surroundings, I believe the term used today is "situational awareness." This experience only helped to reinforce that.

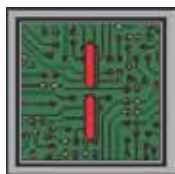
There are many variations but as the old saying goes: "don't judge others until you've walked a mile in their shoes." So the next time someone wants to complain about the fat obnoxious person in their scooter, try looking at it from their perspective. 🌐



<http://www.arrl.org/logbook-of-the-world>

With Just a WSPR

By Dan Romanchik, KB6NU



It's really amazing what you can do with computers in amateur radio, and there's been an explosion in the number of digital modes. One interesting mode that I've recently been introduced to is WSPR, which is short for

Weak Signal Propagation Reporting. The protocol and the original WSPR program was written by Joe Taylor, K1JT, and is designed for sending and receiving low-power transmissions on the HF bands to test propagation paths.

I won't try to cover all the technical details here. There are several sites that cover them pretty well:

- Wikipedia: WSPR [[http://en.wikipedia.org/wiki/WSPR_\(amateur_radio_software\)](http://en.wikipedia.org/wiki/WSPR_(amateur_radio_software))]
- G4ILO's Shack: WSPT - Distant Whispers (<http://www.g4ilo.com/wspr.html>)

I was introduced to WSPR by my friend, Joe, AC8ES. He posted a message to our club mailing list asking if anyone had a toroid core that he could buy to make a QRP balun for 10 MHz. When I asked what he was going to use it for, he said that he was making a WSPR transmitter with a Raspberry Pi, and the balun was for the dipole he built for it. He said that he'd gotten roped into doing this because he'd attended a local Raspberry Pi users' group, and when he mentioned he was an amateur radio operator, they encouraged him to try this project.

How could I refuse a request like that? I have a whole kit of ferrite cores, and after some back and forth, we found a small core that he could use.

The software he chose is WsprryPi (<https://github.com/JamesP6000/WsprryPi>). It's described as a "Raspberry Pi transmitter using NTP-based frequency calibration." It uses a GPIO port to generate WSPR signals anywhere from 0 to 250 MHz. Joe said that there are several Raspberry Pi

programs that run WSPR, but that he chose this one because it seemed to have more features than the others.

Figure 1 shows Joe's setup. Since the output generates a square wave, a low-pass filter is needed to filter out the high-frequency components. As you can see, the GPIO output is fed through a 0.1uF decoupling capacitor into a Mini-Circuits 10.7MHz low-pass filter, then to a 1:1 balun, which is connected directly to the dipole elements.

Joe says, "The antenna is just a dipole taped up to the walls of my living room and hallway." As you can see he made the balun and dipole from 24 ga speaker wire.

The performance of this setup has been kind of amazing. In one e-mail, Joe reported, "Your toroid seems to be working well. Got the balun and antenna finished and executed seven WSPR transmissions from the Raspberry Pi. The WSPR reporting website WSPRnet (<http://wsprnet.org>) came back with a couple dozen reception reports; typical distance is ~300+ miles, max was 593 miles." In a second e-mail, Joe writes, "Did a few more beacon transmissions and checked the WSPR signal reports again. Someone picked up my 5 mW signal from 1010 miles away in Canada."

Joe's turned into quite a WSPR fan. He's even written an Android app - WSPRnet Viewer (<https://play.google.com/store/apps/details?id=com.glandorf1.joe.wsprnetviewer.app>) to retrieve and displays report from www.wsprnet.org. Tapping on a specific report displays more details about it, along with a world map that shows transmitter and receiver locations.

Unfortunately, I don't have a Raspberry Pi, or I'd try this as well. I do have a BeagleBone Black, but there doesn't seem to be software that I can download and install as easily as the Raspberry Pi software. That being the case, this might be a good excuse to purchase one of those new, cheaper RPis. ☺

When he's not writing about amateur radio, Dan, KB6NU enjoys Elmering new hams and working CW on the HF bands. For more information about his operating activities and his "No-Nonsense" series of amateur radio license study guides, go to KB6NU.Com or e-mail cwgeek@kb6nu.com.



Logbook of the World Setup

by John Smale, K2IZ



When we talk to new hams after they have passed their license exams we suggest that, if they intend to do any HF band operations, they should go to the ARRL web site and open a LoTW (Logbook of the World) account.

I won't go into the many reasons why you should, I want to point out some of the steps to filling out your account information. I have had a LoTW account for several years now and I never gave it a second thought until I received a letter from a Ham in Ohio:



“According to the QSL with K2IZ, he did not include the STATE when he signed the QSO. This means that he has not set up his station location to include the state. The only way to correct this is to have him set up his station location data properly to include the state, re-sign the QSO and upload the QSO to LoTW again.”

Well, I went to the LoTW help section, followed the steps and sure enough, not only didn't I have the state but I had never entered the CQ zone (5), ITU zone (8), IOTA (NA026) and the county (Suffolk).

The only reason the ham in Ohio got the letter was he had just moved from Idaho to Ohio and he was reworking states for his WAS award in his new location, I have since updated my station location, hopefully I haven't caused too many problems for the stations I've added in my LoTW account. 📍

New Air Mobile Operator for 2014's Hope for the Warriors Run Jaci, KD2ENX rode along in the News 12 Helicopter providing air support with the tactical callsign “Air One.”



YAHOO!

GSBARC has a New Yahoo Group and the old one has been deleted

If you are a member in good standing and want to join the club's new Yahoo group, go to:

<http://groups.yahoo.com/neo/groups/gsb-arc/>

and click on "Join Group" Be sure to add a note when filling out your information with your call sign so we know who you are!

Club Apparel

Want a shirt, jacket, hat, sweatshirt or t-shirt with a Great South Bay club logo? We now use *Mr. Shirt*, located at 80 East Montauk Hwy in Lindenhurst (www.mrshirt.com). Now you can get color matched backgrounds on your logo too. Check them out...

ARES/RACES Information

- Div. 1—Town of Babylon ARES/RACES**
Net: 146.685/R, Mondays 8:15 PM
EC/RO: John Melfi, W2HCB, (631) 669-6321
- Div. 2—Town of Huntington ARES/RACES**
Net: 147.210 MHz +600/ PL 136.5,
Mondays 7:00 PM
EC/RO Steven W. Hines, N2PQJ, (###) ###-####
- Div. 3—Town of Islip ARES/RACES**
EC/RO: John J Blowsky, KB2SCS, 631-467-2410
- Div. 4—Town of Smithtown ARES/RACES**
Net: 145.430 MHz, PL136.5, Mondays 7:30 PM
EC/RO: Joe Albertus, KB2JOE, 631-664-6709
- Div. 5—Town of Brookhaven ARES/RACES**
EC/RO: Joe Werner, KC2BPS, 631-730-8694
- Div. 6—Riverhead ARES/RACES**
EC/RO: Donald Rollock, W2EUL, 631-929-0705
- Div. 7—Southampton ARES/RACES**
EC/RO: Dennis O'Rourke, KB2ZWW, 631-728-5424
- Div. 8—Southold ARES/RACES**
EC: Don Fisher, N2QHV, 631-765-2757
RO: Charles Burnham, K2GLP, 516-779-4983
- Div. 9—East Hampton ARES/RACES**
EC/RO: Nat Raynor, N2NEI, 631-324-3738
- Div. 10—Shelter Island ARES/RACES**
EC/RO: Neal Raymond, N2QZA, 631-749-9330

Suffolk County

ARES/RACES Net:

**Mondays 2100 Local - 145.330/R (136.5 PL)
Alternate Frequency - 145.370 (136.5 PL)**

New York State

RACES Net (HF)

Sundays 0900 Local, 3993.5 KHz LSB

2015 VE Session Dates

- February 28th
- March 28th
- April 25th
- May 23rd
- June 20th (3rd Sat. due to Field Day following weekend)
- July 25th

All sessions are at the Town of Babylon EOC, located in the basement in the rear of town hall. Please bring photo ID, a copy and your original amateur radio license (if you have one), and any CSCE's you may have. Non programmable calculators are allowed. The exam fee is \$15 payable by cash or a check made out to "ARRL VEC".



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Need Antenna Work?

Sign-up on the list at the EOC. Please supply as much information about your situation so the committee can be properly prepared with assistance and tools when they come to your QTH.

Club Name Badges

Club name badges are available from *The Sign Man* (www.thesignman.com) of Baton Rouge, LA.

The badges which are 1-3/4 in. x 3 in. If you visit The Sign Man's webpage you can order the badges by using a drop down selection on the orders page and clicking on "Great South Bay ARC - NY"



February Birthdays

- Charles, KC2WMQ**
- Paul, W2PB**
- Mike, KA2DYS**
- Julie Ann, N2XOB**
- Gabby, KC2WUP**
- Bob, K2TV**
- Pres, W2PW**
- George, K2KVI**
- Charles, K2CAF**



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