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Winter 2006

The Bulletin of the
Richmond Amateur Telecommunications Society
P.O.Box 14828
Richmond, VA 23221
www.rats.net

New this year: IRLP

The RATS repeaters are now connected to nodes around the world using the **Internet Radio Linking Protocol**. Now you can communicate around the world with a Technician license. The club nodes are:

4424 on VHF (146.88)
4955 on UHF (442.5)

To access the IRLP:

1. Key your radio
2. Hit # on the DTMF pad, then enter the 4 digit code of the node you want to connect to. Lists of nodes can be found at http://irlp.net
3. You will hear a message when the other node connects.
4. I.D. and talk as you would on your local repeater. Be sure to allow extra time between keying the mike and talking to allow for network delays.
5. When you are done hit #73 to disconnect from the node.

For more information about the IRLP:
http://irlp.net
http://www.rats.net/irlp.html

W4RAT Repeaters
146.880
442.550
Standard Offset
PL 74.4 Hz

FROSTFEST 2007

The 2007 edition of the Richmond Frostfest will be held February 18th at the Showplace on Mechanicsville Turnpike. Some highlights:

- ARRL state convention
- Commercial vendors
- Flea Market
- VE Sessions
- Forums
- Prizes

Volunteers are needed for set-up the night before, and during the Frostfest. For more information, or to order tickets and reserve tables visit www.frostfest.com.

What is a dB?
Contributed by Robert Orndorff, W4BNO

This article will explain the concept of a dB and dBm in order to understand the readings given by the RATS repeaters.

"dB" is an abbreviation for decibel. A decibel is one tenth of a Bel (The Bel is named for Alexander Graham Bell). A dB is a ratio between two values. The ratio can be between voltages, currents or power and many other measurements. Since the dB is a ratio there needs to be two readings. The letter following "dB" tells you what the reference reading is.

dBV=voltage ratio referenced to 1 volt.
dBm=power ratio referenced to 1 milliwatt

There are many others, but this article will be limited to dBm and how it relates to receive levels. So break out your favorite scientific calculator, spreadsheet or slide rule and you too can calculate dBm.

$dBm=10 \log_{10}(P2/P1)$ where P1 is the reference power, which in this case is 1 miliwatt. This is the formula for power. Also note that for voltage levels the dB is calculated using the formula:
$20 \log_{10}(V2/V1)$

Why use the log function? Why not just use a ratio? If you do the math on a typical receive level, let's use -90 dBm, you'll find that -90 dBm is equal to a 9 digit decimal (0.000000001 mW). Here are some examples:

0 dBm = 1 milliwatt
-30 dBm = 0.001 milliwatts
-50 dBm = 0.00001 milliwatts

You can see the pattern here. Since receive levels are so small, dBm is a convenient way to express them. Of course this works the other way, too. A positive dBm reading indicates powers of 10 on the left side of the decimal. 100 miliwatts is equal to +20 dBm. 1 watt (1000 miliwatts) equals +30 dBm.

So how does this relate to S units? That's a little less clear. It is clear that one S unit equals 6 dB. However there are several definitions of what exactly S0 is. Some rate -127 dBm as S0 and others have it at -121 dBm. If we use -127 as S0 then a S9 signal is equal to -73 dBm. (This is the part where you may want to get out your spreadsheet and start playing with the numbers). It may also make sense to have S0 set to the minimum discernible signal (MDS) rating of the particular receiver you are using. Using –127 dBm as S0, then the corresponding S units would be:

-127 dBm	S0
-121 dBm	S1
-115 dBm	S2
-109 dBm	S3
-103 dBm	S4
-97 dBm	S5
-91 dBm	S6
-85 dBm	S7
-73 dBm	S9

To be complete we should also talk about voltages, because some times receiver sensitivity is specified in microvolts. It is not possible to directly compare microvolts and dBm because one is a voltage and the other is a power. However, if you know the impedance of the receiver, then it is much easier. If you have a fixed resistance and apply a known power, then you can calculate voltage. You can also calculate the power if given the voltage.

Field Day 2006 Results
Contributed by Robert Orndorff, W4BNO

RATS Field Day 2006 was held once again at the Laurel Park recreation area in Henrico county. This year we had our highest score ever and that is due to the many people that helped in organizing the event. I can't say enough about all the people that participated in the planning and the event itself. This was a great club event.

We had two HF stations, one GOTA station and a VHF station. Two HF stations have always seemed to be the appropriate number based on the number of people we have participate.

We had the biggest array of antennas in many years (maybe the biggest ever). We had two 160 meter horizontal loops, four 40 meter loops, one 20 meter loop and a 80 meter Carolina Windom. Each HF station had two 40 M loops (one N-S and one E-W) and a 160 M loop. The GOTA station had the 80 M Windom and a 20 M loop.

We also used the club's laptops along with some club members' laptops and did all of our logging using N3FJP Field Day logging software. We had the computers all networked so any station can see what the other is doing and dupes are tagged immediately. The program also makes the job of tallying the score much easier.

Here's a breakdown of how we did:

722 CW QSOs
1536 Phone QSOs (348 of these were on the GOTA station)
1050 Bonus points
7010 Total points!

And here are the results, as reported in QST Magazine:

- RATS competed as a Class 2A Station...
- We were number **2** out of 11 2A stations in the state of Virginia (Top 18.18%, last year we were #3 out of 9, top 33%)
- We were number **33** out of 455 2A stations competing (Top 7.25%, last year 99th out of 451 - top 22%)
- We were number **9** out of 62 entries from Virginia (Top 14.5%, last year 13th out of 58 - top 23%)
- We were number **123** out of 2184 entries overall!!! (Top 5.6%, last year 329th out of 2202 - top 15%)

That's quite an improvement over last year's score of 4162 and our best score ever. Now you see how we stacked up against the other entrants this year.

CONGRATULATIONS TO EVERY HAM WHO WORKED THE AIRWAVES DURING THIS EVENT!

Club Meetings

The RATS club meets on the 3rd Friday of every month at the West End Volunteer Rescue Squad, at 1802 Chantilly St. in Richmond.