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February 5th  
at 7:00pm

## BIRTHDAY

## CLUB

Name	Date	Call
Richard	2/5/35	KB8VLC
Mark	2/7/97	KD4HYO
Danny	2/10/97	N8VVL
Ben	2/10/97	AC4KO
Edward	2/14/23	KB8VKZ
Creston	2/18/97	NM8V
Kay	2/18/42	KC8CZC
Ralph	2/18/52	KB8SUD
Lisa	2/28/97	KF4JNX



## 1998 GARC

## CLUB OFFICERS

President -	Jeff	N1DJS
Vice President -	Lisa	KF4JNX
Secretary -	Jerry	KB8PBY
Treasurer -	Dot	KB8TQU

## MEETING MINUTES

(KB8PBY) The meet ing was called to or der at 7:05 PM by club president, Jeff N1DJS. Introduction of the 1998 club of fi cers.

Re port on Roy NL7FK. He is home and do ing OK as far as we know. Re port on Jane Cahall from the county commissioners of fice, She will at tend one of our meet ings at a later date. A short dis cus sion on the pass ing of John Cush ing. Passed around to the mem bers a card from Margaret Cushing thank ing us for the friend ship that we pro jected to John. Discussion on our last Ham Fest. Gordy WB8YGW pre sented some ideas that we could improve on and the members added some ideas also. Discussion on put ting ads from the ven dors in the sur round ing ar eas in our news let ter. Lisa KF4JNX will look into this and follow up on it. Net control discus sion. Net control for each month in 1998 was de cided. Each net con trol will obtain their own back up and Lisa KF4JNX will as sist with this.

Jerry WB8IOW dis cussed about hav ing ama teur ra dio classes from the De For est club lo ca tion. The classes will be held on Fe bu rary 10, 1998 on Tues days and Thurs days of each week dur ing this time for about 4 to 5 weeks. Will have to find out the time for these classes. A motion on the floor from John K8RJ and second by Jerry K8IN to as sist in these classes by our members. Mo tion car ried by the mem ber ship.

A new position of PIO (Public Information Officer), was initiated. Hal KB8SUM will head this position and Lisa KF4JNX will as sist. Application forms were passed to the paid mem bers to fill out to up date ad dresses etc. Break at 7:50 PM. meet ing back to or der at 8:05 PM.

Short discussion on the repeater repairs. The mem bers showed their ap pre cia tion of the repairs and the use of the repeater by sending a fruit basket to the responsible party. A mo tion to do this was made by Dot KB8TQU and sec onded by Marie KE4MZP . Motion carried by the membership. A mo tion to make the owner of the repeater an honorary member in our club was made by Russ N8CGO and seconded by Lisa

KF4JNX. Motion carried by the member ship.

A demonstration by the Red Cross will be pre sented to our club at a later date. Jerry KB8PVY will ar range this demon stration by contacting the Red Cross.

Kim N8YWX dis cussed the weather spot ter training that will be held on march 3rd, 1998 at 7 PM in West Union at the De For est club location. Jane Ca hall will as sist in this training.

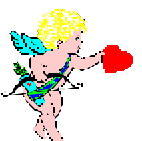
Discussion on having picnics this coming year. Bob N4VGI suggested that we have the picnics with other clubs. There was no motion on this, but the club thought that it would be a good idea. Jutta N1WJM and Lisa KF4JNX will head this for our club and a representative from the other clubs will head theirs.

Discussion on the County wide crisis man agement meeting was brought up by the club President Jeff N1DJS. We will have two repre sen ta tives from our club to at tend. Their will be also room for a few more that are interested in attending. This meeting will be held on Fe bu rary 5, 1998 at be tween 8 AM and 4:30 PM. Those at tend ing should no tify Jeff N1DJS.

Net con trol for the year 1998 :

Jan.	Jeff	N1DJS
Feb.	Rodney	WD8CTX
Mar.	John	K8RJ
April	Gordy	WB8YGW
May	Hal	KB8SUM
Jun.	Jutta	N1WJM
July	Lisa	KF4JNX
Aug.	Roy E.	KE4MZN
Sept.	Jerry P.	WB8IOW
Oct.	Al	WB8UJM
Nov.	Larry	WD8LSN
Dec.	Jerry	KB8PVY

The refreshments that were brought to the meeting by Kathie KA8FCX were very much appreciated and were delicious. Thanks, Kathie. For the month of Fe bu rary, Re fresh ments will be pro vided by Roy NL7FK ac cord ing to the sched ule. A mo tion to ad-



# ARE YOU WELL GROUNDED?

(KE4ZV) There are three main reasons to ground radio equipment.

1. Safety grounding to protect operators from accidental electrical shock.
2. RF grounding to prevent spurious and harmonic radiation and to enhance antenna efficiency.
3. Lightning protection.

Each of these require different grounding technique. A careful analysis of the ground methods used is required to determine if all three objectives are met.

Safety grounding is in many ways the easiest criteria to meet. Simply bonding all equipment cabinets to the power company ground with conductors of low resistance and adequate current carrying capacity to blow the circuit breakers will meet safety requirements.

Effective RF grounding is often much harder to achieve. The ground path must not offer any significant impedance at the frequencies of interest. Since the frequencies of interest are often octaves apart, this is challenging. The frequencies of interest are the fundamental frequency of the transmitter, the harmonic frequencies of the transmitter, and any spurious frequencies the transmitter may generate. The latter is usually the toughest.

Grounding for lightning protection is difficult due both to the magnitudes of the voltages and currents involved and to the fact that the lightning waveform is a step function and has considerable RF energy.

Probably the *WORST* problem one faces in designing an effective grounding system is the prevention of *GROUND LOOPS*. Ground loops will cause unintended currents to flow in circuitry, often with disastrous effects. Either damage or degraded operation will inevitably be the result of a ground loop.

The best method of securing a good ground for a radio installation is to use a *GROUND WINDOW*. The ground window technique requires that every cable that enters or leaves the radio room pass through one small area where all ground connections are made.

The power company ground must be bonded to the ground window and surge suppressers such as those marketed by Lightning Protection Associates should be installed in series with the hot wires. Note that simple shunt protectors will not be sufficient to protect the equipment in the event of a direct lightning strike. Series protectors are designed to open the circuit under severe overload.

All coaxial cables must have their shields attached to the ground window and have their inner conductors clamped with an arc cartridge designed to fail shorted. In addition the inner conductor should be fused in a manner that will open the line when the arc cartridge fails. Telephone cables must enter through the ground window and have their leads clamped with MOVs and arc cartridges that are designed to fail shorted. In addition all leads must be fused in a manner that will open the line when the arc cartridge fails.

Each piece of equipment in the radio room must be attached to the ground window by a wide heavy strap installed so as to be as short and straight as possible. Neatness definitely does not count here. Don't "dress" the ground cable, make it short and direct. Do not "daisy chain" grounds. Make sure that the only path from one piece of equipment to another is via the ground window. This means that interconnecting shielded cables should go from the equipment out to the ground window, have the shield bonded to the ground window, then return to the next piece of equipment. This is the only sure way to prevent circulating ground currents.

Now that every piece of equipment in the radio room is at the same potential as the ground window, the ground window must be brought to true earth ground. This is fairly easy for DC and low frequency AC, just make sure the cable is heavy enough to have the smallest possible voltage drop across it. For RF, inductance and resonance effects must be considered as well as skin effect. A wide flat copper strap that is routed as straight as possible to earth ground is preferred. For maximum lightning protection, the ground strap must never travel upward because the space charge will resist the current flow. Sharp bends

will act as single turn inductances and should be avoided. Since a single ground cable will exhibit resonance at certain frequencies due to its length, several ground cables should be used with each a different length. The lengths should be chosen such that a cable that is near a quarter wavelength at a given frequency will be paralleled by a cable that is near a half wavelength. In practice, several cables varying from the shortest possible length to twice the shortest length should be paralleled so that at least one will present a low impedance at any frequency. Do not coil the longer cables instead fan them at the center point. The method used to route cables down the tower will effect the degree of lightning protection achieved. If possible use a plumber's delight type of antenna that is dc grounded to the tower. Route the coax down the inside of the tower, and ground the shield of the coax to the tower at  $H_s/_{x6}$  points. This last will short out the single turn transformer formed by the tower and the shield of the cable. Unless this transformer is shorted currents flowing in the tower to ground will induce currents in the shield of the coax.

The true ground must be more than a single stake driven into the earth. If the tower is ground mounted, use the base of the tower as the center of the ground field, otherwise drive an eight foot ground rod to form the center point of the ground field. Run radials out from the center of the ground field to a buried loop connecting a series of ground rods separated from each other by no less than eight feet. A minimum of eight rods should be used. If possible, the radials should continue outward for one quarter wavelength at the lowest frequency of operation. If your tower is not ground mounted, bring its base ground back to the ground window using multiple lengths of cable as discussed above. Do not run a ground cable directly from the isolated tower to the true ground or a ground loop will surely be created that can allow damaging circulating currents to develop.

This all sounds like a lot of work and expense, but field experience has proven that a system like the one described will withstand direct lightning hits without loss of equipment, air time, or lives.

## V.P. VIEW

(KF4JNX) Well, here we go again! A new year; a new start. The possibilities are endless.

I am grateful for the opportunity to represent the club in a role of leadership. I can still tell you, after being a member for about two years, that I have never been part of a group that 'pulls together' the way this club does. So, if you receive this newsletter and are not a member, or you are not an active member, you're missing out. There are a lot of different club activities; something for everyone. And, if you've thought of something new, let us know. We're always looking for new ideas!

As requested from the president, Jeff, I have decided on my personal goals in radio for 1998. I'm planning to upgrade to the next class of license and to do my best to enhance the club in 1998. I will let you know from time to time how things are going.

Reflecting on 1997...overall it was a good year. Some things went well and some didn't go quite as planned, however, we were successful. I believe that this year will be the same as long as we don't lose sight of what we're here to do...provide emergency communications, learn, and enjoy the hobby of radio.

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If you get something for nothing then someone got nothing for something.

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## HAMS ACTIVE AFTER STORM

(K4EC) Local ARES/RACES units were activated in Virginia following a surprise storm January 27 that left two feet or more of heavy, wet snow in parts of Appalachia. At one point, more than 60,000 were reported without power between the Roanoke Valley and the Tennessee and Kentucky borders. Governor Jim Gilmore declared a state of emergency and activated the National Guard to help, and power is being restored. At least one death was blamed on the storm, which snarled traffic and stranded travelers on two major interstate highways. In Scott County on the Kentucky border, ARES was activated on the evening of January 27 and helped to provide emergency communication there. "I spent the entire night at the EOC," reports District 14 DEC and Scott County EC Jim Flanary, K4LMP, of Gate City. Flanary says Dickenson County ARES also activated.

"It was a rough night for a lot of us," he said. Flanary reports some homes in his area could be without power for as long as a week. "We are assisting in every way possible to help out in this time of need." Virginia SEC and State RACES Chief Frank Mackey, K4EC, says Chesterfield County ARES (Richmond area) offered to mobilize its ARES communications van, which is equipped with a generator, portable repeater and two operators. "We are monitoring their activities and the need for additional

assistance," he concluded. By week's end, temperatures had risen and the snow was reported melting fast.—*Frank Mackey*,

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## THE OYSTER

(Unknown) There once was an oyster  
Whose story I tell,  
Who found that some sand  
Had got into his shell.  
It was only a grain,  
But it gave him great pain.  
For oysters have feelings  
Although they're so plain.

Now, did he berate  
The harsh workings of fate  
That had brought him  
To such a deplorable state?  
Did he curse at the government,  
Cry for election,  
And claim that the sea should  
Have given him protection?

No – he said to himself  
As he lay on a shell,  
Since I cannot remove it,  
I shall try to improve it.  
Now the years have rolled around,  
As the years always do,  
And he came to his ultimate  
Destiny – stew.

And the small grain of sand  
That had bothered him so  
Was a beautiful pearl  
All richly aglow.  
Now the tale has a moral,  
For isn't it grand  
What an oyster can do  
With a morsel of sand?

What couldn't we do  
If we'd only begin  
With some of the things  
That get under our skin

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## GRAMMY HAM

Patty Loveless, KD4WUJ, tops Grammy nominations: Having wowed the critics with her album *Long Stretch of Lonesome*, Patty Loveless, KD4WUJ, was rewarded with three Grammy nominations. In addition to best album she was nominated for best female country vocal performance for "The Trouble With The Truth" and best country vocal collaboration for "You Don't Seem to Miss Me" with the legendary George Jones. Loveless' three nominations make her country music's leading Grammy contender. The Grammys will be awarded February 25.

## W1AW INAUGURATES NEW 20-METER BULLETIN RIG

(Newsline) If W1AW's 20-meter signal has sounded especially robust in the past couple of weeks, you can thank the generosity of manufacturers and lots of hard work on the part of the W1AW and the ARRL Lab staffs. As a first step in upgrading and replacing some of its aging station components, W1AW has purchased and installed a new Ten-Tec OMNI VI Plus transceiver and a custom-built Command Technologies single-band, three-tube, grounded-grid linear amplifier. Eimac donated the three 3CX800A7 power amplifier tubes for the Command amp. With help from other Headquarters staffers, W1AW Station Manager Joe Carcia, NJ1Q, installed the new gear during January to replace the older Harris commercial transceiver and amplifier used to air W1AW code practice and bulletin transmissions on 20 meters. Carcia praised both manufacturers for going the extra mile. "Ten-Tec modified our OMNI VI Plus by installing additional crystal ovens," he explained. "The result is a clean and very stable signal." Carcia said Command Technologies had to redesign its HF-2500E 5 kW linear, normally a desk top unit, so it would fit easily in the W1AW equipment racks. The RF deck was modified to allow a maximum of 1500 W output. The unit also has overdrive protection to ensure longer tube life. Earlier this year, the station also installed two new MFJ-812B VHF SWR/wattmeters, donated by MFJ, plus a new two-meter bulletin transmitter—a Kendecom MT-4 repeater transmitter.