

VOLUME 33 ISSUE 4
GARC OFFICERS

APRIL 2005

• **PRESIDENT:**

BOB JONES
W5BJ
W5BJ@ARRL.NET

• **VICE PRESIDENT:**

JOHN GALVIN
N5TIM
N5TIM@ARRL.NET

• **SECRETARY:**

LAURA RICHARDS
KD5KJC
KD5KJC@COMCAST.NET

• **TREASURER:**

ALLEN YODER
NG5Y
NG5Y@ARRL.NET

• **COMM. OFFICER**

RALPH BROWN
KA5KVF
WRBRAUN@JUNO.COM

EDUCATION OFFICER

GARLAND NEWMAN
W5IDN
W5IDN@ARRL.NET

• **ARCLITE EDITOR**

KAYE DUNCAN
KSAYE@VERIZON.NET

• **TRUSTEE:**

BOB JONES
W5BJ
W5BJ@ARRL.NET

THE PRESIDENT'S PEN BY BOB JONES W5BJ



Greetings,

This is going to be a short note this month. But, don't forget that the ECC is open on the third Saturday of each month. There's no special purpose in mind, just come and have fun either operating, selling, shooting-the-bull or just sitting around. The more the merrier.

Also, if you have not signed up to participate in one of the Club-sponsored special events; please consider doing so. It's a lot of fun and you'll learn a lot about operating under emergency conditions. Don't forget that providing communications during emergencies is a strong justification for the frequencies allotted to amateur radio.

The long-awaited Club rosters should be included in this ArcLite. Please check your data for accuracy. Contact Laura Richards for any changes.

Our program this month should be another good one – demo on spark gap transmitters. Hope to see all of you at the meeting on April 25th.

73'es,
Bob, W5BJ

3RD SATURDAYS @ THE ECC

Since we are soooooo proud of the newly remodeled ECC, the GARC has decided to show it off in style. On the 3rd Saturday of each month, the ECC will have an open house from 9:00 am until 12:00 noon. The event is come and go and very informal. It is a time when we can get together in a less formal gathering and just discuss ham stuff. You can operate any of the stations at the ECC and maybe even get the HF bug. We are also allowing you to bring your "ham junkie" to sell. We have a few tables at the ECC but be prepared to have a backup plan to display your goods if they are all being used. Please limit it to ham or ham-related items. Come on down on the 3rd Saturday of each month and join in on the fun!

ON THE HORIZON...

April 25th, 2005: Spark Gap Transmitters - Actual demonstration of how spark gap transmitters work.

May 23rd, 2005: Practical Antennas - Presented by Don Murray, W9VE

June 3rd, 4th & 5th, 2005: HAMCOM - Arlington Convention Center

July 1st—July 4th:

WHAT WOULD YOU LIKE TO SEE?

If you have a topic or training that you would like to see provided at a future GARC meeting, please email John Galvin at n5tim@arrl.net. This topic could include emergency procedures, new radio operator topics, license upgrade topics, public service training or new operating modes. Also, if you have a program or topic that you would like to present, please let John know as well.

IS YOUR INFORMATION CORRECT?

One of the biggest difficulties of any club is keeping accurate information on its members. When we change internet providers or jobs, many times we forget to update everybody. We can provide information and newsletters quickly and efficiently if we have an accurate member information.

Well, one of our own has provided an invaluable tool for the club. Janet Crenshaw has developed a web-based club roster system to keep the most accurate and up-to-date information possible. Janet has even donated the server space to run the web roster on.

This new tool allows you to send any information change to any club officer and the changes happen immediately. You don't have to wait until the next club meeting to submit the changes. This project has been needed for a long time and we are grateful for the work Janet has put into this project.

GARLAND SIREN TEST

The Garland early warning sirens are tested by the city the first Wednesday of each month at noon, weather permitting. Tests are generally conducted on the GARC repeater at 146.660Mhz with 600Khz negative offset.

Amateur radio operators wishing to help with these siren tests should contact Bill Richards, KM5VZ if interested in helping out.

GARC MEETING MINUTES

Garland Amateur Radio Club Board of Directors Meeting April 11, 2005

Bob Jones started the meeting @ 7:00 pm

All board members present except for Allen Yoder due to work.

GARC May meetings topic will be presented by W9VE Don Murray Practical Antennas

Don't forget the 3rd Saturday of each month is open house at the ECC from 9-Noon

John Galvin has obtained tires & a rim for the antenna trailer from CMN Tires

Field day logistics was discussed. The board is trying to figure out how to get the public to come see what we do & to determine where we want to set up near Webb Middle School off of Spring Creek & N Garland Ave.

Garland Newman looking into the cost of additional GARC banners for Field Day.

Please see John Galvin to help make Field Day a success this year. Field Day will be from about noon on June 25 to noon on June 26. John is looking for help in organizing each of the different station sets ups.

Your 2005-2006 board members are:

President:	Bob Jones
Vice President	John Galvin
Secretary	Laura Richards
Education	Garland Newman
Comm.	Ralph Brown
Treasury	Allen Yoder
ArcLite	Kaye Duncan

Garland Amateur Radio Club Meeting Minutes March 28, 2005

Meeting Minutes were unavailable at Press Time

Highlights Included:

Guest Speaker for the March meeting was Jim Haynie (W9JBP), President of the ARRL was the guest speaker.

Board Elections took place. The 2005 board members are:

President:	Bob Jones
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Secretary	Laura Richards
Education	Garland Newman
Comm.	Ralph Brown
Treasury	Allen Yoder
ArcLite	Kaye Duncan

APRIL CALENDAR OF EVENTS

Sunday		Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
<u>27</u>	<u>Mar</u>	<u>28</u>	<u>29</u>	<u>30</u>	<u>31</u>	<u>1</u>	Apr <u>2</u>
		7:30pm GARC Monthly Meeting			9:00pm Garland RACES Training Net		MS Walk, Addison
<u>3</u>	<u>4</u>	<u>5</u>	<u>6</u>	<u>7</u>	<u>8</u>	<u>9</u>	
8:00p -9:00p Dallas RACES			12:00pm Garland Siren Test 1:00pm Rowlett Siren Test	9:00pm Garland RACES Training Net			Lancaster Bike Rally
<u>10</u>	<u>11</u>	<u>12</u>	<u>13</u>	<u>14</u>	<u>15</u>	<u>16</u>	
				9:00p Garland RACES Training Net		9:00am 3rd Sat. @ the ECC 9am -noon	
<u>17</u>	<u>18</u>	<u>19</u>	<u>20</u>	<u>21</u>	<u>22</u>	<u>23</u>	
8:00p -9:00pm Dallas Races Training Net				9:00p Garland RACES Training Net			
<u>24</u>	<u>25</u>	<u>26</u>	<u>27</u>	<u>28</u>	<u>29</u>	<u>30</u>	
	7:30pm GARC Monthly Meeting			7:30pm Garland VE Testing 9:00 pm Garland RACES Training Net		WalkAmerica 2005 at White Rock Lake	

NEW HAM PARTNER

BY GERRY CRENSHAW

New Ham Partner 22

A series of continuing articles for our new members

Lightning protection II

If you have been in amateur radio any length of time, you have probably planned for having a near lightening strike. Hardening the shack for a near miss is straightforward enough. The rules of ground and shield are well known. But what about a direct strike?

On October 13, 2000, my tower took a direct lightning strike and caused quite a bit of damage. My questions after this event were:

- Were my precautions effective at all?

What else could I have done (or do in the future) to protect myself and my shack from a direct lightning strike

This article is my analysis of the situation. Worms and all.

The Station

My station at the time consisted of a 35 foot tower with a Cushcraft AS-3 Tri-band beam on a Yaesu rotor. These were connected via coax to the main HF radio in my garage which was a Kenwood 870 connected to a Collins 30L1 Linear amp. I have a PC for Packet and other digital modes and a TV for ATV use.

For those of you who know me, you know I tend to over-engineer. I followed all the standard precautions and a few more besides trying to ground my amateur radio station to a half mega-volt one thousand amp surge. The embedment section of tower that went in the concrete had individual ground rods bonded to each leg of the Rohn 25 and driven in the ground at the base of the excavation. I had made a point of not bonding the rebar to the antenna embedment section. I have seen concrete crack from lighting strikes at work because of the intense heating if the support structure is bonded to the rebar.

The HF station was all neatly mounted in a roll-around nineteen-inch equipment cabinet. The AC input was a GFI outlet, and this fed a surge-protected rack mount multi-outlet strip. There was a spark-gap lightning protection device on the antenna coax feeding the house with a separate grounding wire to an individual ground rod. A coil of coax was mounted at the antenna as recommended by Cushcraft for lighting protection. Additionally, I had made a point of splicing the coax on the tower with SO-239 feed-through connectors and grounding this to a separate ground. All grounds on the equipment were taken to a house ground. My television and PC sit next to the radio gear on an old industrial steel work-bench.

All in all, I thought I had done a pretty good job of protecting the station.

The Strike

On that day, a squall line/thunderstorm passed over our area. The weather had been dry for months and we welcomed the rain. All the reservoirs in the area were low. At about 2pm, my daughter (KD5DTP) called to tell me that the security system alarm was sounding and she could not turn it off even after double-checking the codes with me.

I had her disconnect the AC and the battery that powered the alarm and drove home. When I got home the house was silent, but the alarm would not reset and sounded again when power was established. Then I looked to find out what was wrong. The first thing I found was that the refrigerator was not running. A quick check revealed that there was no AC power for the refrigerator. I traced this circuit to find that it was a branch off of

NEW HAM PARTNER cont.

one of GFI-protected circuits. Yes, that was the same circuit that my radio equipment was on.

When I pulled the cabinet with my radio gear away from the wall, I found that the GFI outlet was not just inoperative, it was slag. It had been turned into molten plastic and metal that had cooled now. Now I KNOW something serious happened.

What Next?

A quick check of the radio gear revealed that everything showed scorch marks including an obvious scorch trail from the microphone connector to the cabinet. When I went to unscrew the mike connector it crumbled in my hand. Other interconnecting cables were burned completely through. We've now diagnosed a probable near lightning strike.

Now to find out the extent of the damage.

After getting power restored, I found that none of the radio gear would turn on, nor the TV or computer that hooked into the same circuit. The small 4-port LAN hub would not turn on either. That gave me my next hint: not only did this strike my radio (via the coax) and the electric circuit (attached to my radio), now it hit my computer LAN (attached to my computer and the electric circuit).

The next order of business was to check the house LAN. None of the PC's on the household LAN showed that they were connecting to each other: all of the lan cards in the computers were dead. The main house LAN hub also wouldn't power on. That became the next order of business, repair any of the household systems first, and then the radio equipment last.

After replacing the Ethernet cards in the PCs, I worked on this for a while to find that the RJ45 connectors to the main hub and to several of the PCs were bad now. These are simple insulation displacement connectors and during the strike they had been hyper vibrated and no longer made a reliable connection. After replacing all these connectors the LAN came up.

Investigation, look for the entry.

With the household systems restored I began to look for the strike entry. My first clue came when I looked at the base of the tower. Several things caught my eye. First, there were several divots around the base of the tower, and literally hundreds of dead worms on the driveway near the tower base. The grounding on the tower had worked to a degree. But with the dry weather, I was not making a good ground deep into the earth but only at the moist conductive layer near the top. The water in the earth had flash-boiled to steam and exploded outward taking the dirt with it. The worms in this moist layer flash-boiled as well and tried to escape. The tower had been the locus of the strike as nothing else showed this evidence

And, now we realized we had had a direct strike, not a near miss.

With an antenna analyzer and VOM in hand I climbed the tower and found the where I had spliced the coaxes together. The connectors looked like a child's party favor with the outside of the PL-259 connectors was peeled away. The centers of both coaxes were completely burned through. The coax surge protector read a dead short. I would have to re-terminate the coax at the top of the tower before I could look at the antennas with test equipment. Strangely enough the only scorch tracks I saw were at the surge suppression and at the coax splice. The antenna did not show any obvious damage as I expected.

The Path

The path on the strike seemed to be this: Strike hits the tower and follows the ground down runs. Because the grounds were not real conductive due to the dry spell, it sought another path. It found this through the radio and linear and the surge-protected outlet to my house ground. In addition, it found another path through the electrical system and GFI outlet. Everything attached through the GFI outlet was damaged. It tried to seek a ground through the LAN and damaged a few things there but this was not a good ground. The Security system used magnetic contacts and all the contacts seemed to have frozen closed during the strike. I would later find other magnetic problems.

NEW HAM PARTNER cont.

Every thing had worked. It seems that all the precautions had done their job and had it not been for dry soil, may have worked even better. Each step along the way had done a small part to take the lightning to ground as planned. Basically it had stayed confined to one circuit. The LAN hubs had actually made great fuses and protectors. If those had not been in the LAN, I think I would have wound up replacing PC's rather than Network cards.

One thing I did after the strike was drive new ground rods for each corner of the tower and attach them to the tower above ground level. A strike such as I took was sure to have blown the connections I had made to the imbedded ground rods. I felt very fortunate that the tower base had not cracked as I had seen at other installations after a strike.

I gave it a few days to see if anything else would fail before making the final report to the insurance company. I also had an electrician come out and inspect our system. He checked several things I had not thought of like the doorbell and garbage disposal. He tested all the remaining GFI outlets. He checked most of the branch outlets with a circuit tester looking for open grounds.

Aftermath.

One of the oddest results of this strike was what happened to my computer monitor. As the computer monitor seemed to turn on, I did not replace it immediately but waited until I had a working computer to test it. When I got the computer home and turned on PC the screen tore in patches of green and red. I first assumed the monitor got hurt by the strike as well. The new TV came out of the box and turned on with similar results but the picture was spotted with streaks of blue and green.

In trying to figure this out, I took the monitor off of the bench and set it on the floor to get to the PC. Magically, the picture cleared up. I took the TV off of the bench next and set it on the floor and it cleared up as well. When I set either back on the bench the screens tore again. As I moved either of the CRT's across the bench the distortion changed, changing color. I took a standard magnetic compass and ran it the length of the bench to find that it changed and flipped directions several times.

The strike had magnetized my workbench.

This took a bit of work to fix, but in the end I used a 5-gallon water bottle as a form and wound a big degaussing coil. I used every bit of magnet wire I had in the shack. The ends were spliced into an extension cord and a switch added and then plugged into AC and tested. It produced a powerful magnetic field but it heated up fast. I could only use it for 30 seconds or so in a stretch. I treated the workbench with a few passes and then let it rest. A new check with the compass showed improvement but I took a few more passes to neutralize the bench.

Conclusions

The grounds, GFI, Surge suppression and so on all worked. But they only worked as good as the ground that they were connected too. I have explained that this was poor at the time. Everything I did mitigated the results some and kept it confined to one branch circuit. True I lost my radio equipment and had some household damage, but I did not have a fire or have anyone injured. In the end I got new equipment out of this.

And, by attracting the lightning to the tower, it did not hit my house and cause much more severe damage. This was also a public relations coup with the neighbors since we could demonstrate that their houses would have been at risk without having our lightning rod... err... tower nearby. Hooray for Ham Radio.

GARC GENERAL INFORMATION

Repeaters:

The GARC operates two open repeaters for its members and for all local or visiting Amateur Radio Operators: Two meters: **146.66 (-)** and 70 Cmeters: **442.70 (+)**

Voice Mail:

For late-breaking news or to leave the club a message, call our 24-hour voice-mail line at **(972) 272-4499**.

Internet:

Information on the GARC can also be found on the world wide web address below:

<http://www.qsl.net/garc/>

The web site includes a map to the monthly meetings, classes, links to local public service events, and other items of interest to the hams in the Garland area.

Newsletter:

The Arclite is published monthly for the members of the Garland Amateur Radio Club. The contents of this newsletter are copyrighted the date of publication, but may be reprinted without permission in any Amateur Radio Publication provided proper credit is given and the motive is the advancement of amateur radio and not for profit.

The deadline for Arclite materials is the 2nd Monday of each month. If you have any informative or educational articles that you would like to see included in this newsletter, or if you have items to be included in the GARC calendar, please email it to the Arclite editor at **kaye.duncan@verizon.net**.

Membership:

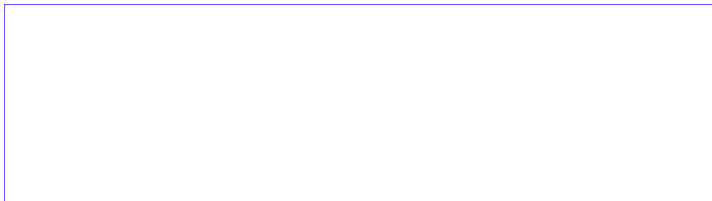
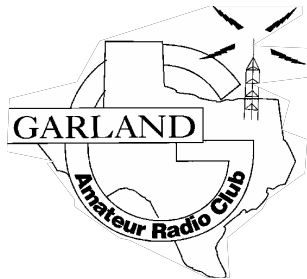
Membership forms are available at the GARC monthly meetings and on the GARC web site. Once the membership form and dues are submitted, new members are voted in at the next GARC monthly meeting.

The GARC membership roster is distributed to GARC members only and is included twice a year in the Arclite. It is not to be used for any commercial purposes.

To submit changes to the GARC roster (such as change of address, updated phone numbers, license upgrade, etc), send them to the GARC secretary, Laura Richards at _____.



Garland Amateur Radio Club
Emergency Communications Center (ECC)
1027 B West Austin Street
Garland, TX 75040



Please Rush!!!

Reminder

3rd Saturday @ The ECC - April 16th, 2005 - 9 am to 12 noon