



MARS NEWS

Mecklenburg Amateur Radio Society



INDEX

Program	1
Pres. Letter	1
Repeater Birth ..	2-3
Field Day	4-5
Board Meets	6
Renewal/Dues	7
Club Info	8

**Next Meeting - Tue. July 27 @
7:30pm
East Baptist Church**

Program: Jason Kay - N4JCK
*Linux Operating System
with Ham Radio Applications*



President's Letter

Hello All,

Thanks again to all who helped make our 2004 Field Day a huge success. We had plenty of opportunities for operators, but I understand that some folks could not come out due to vacations or other commitments. I hope you'll take some time to come out next year. Special thanks to WB2NHQ, WB2RHM, KA4WYC, AD4IE, KG4IOE, and KI4CXO for their excellent help and assistance.



**President
Shawn Goodin
K4RSG**

ship renewals are due this month. If you haven't already sent yours in, for your convenience there is a renewal form on page 7 of this newsletter. The various membership dollar amounts are shown on the form.

Have a good summer!

73,
Shawn, K4RSG

The MS-150 is coming up -- we'll need the usual full complement of HAMs to make it work. A signup sheet will be circulated at the July and August meetings. Help is needed for staffing rest stops, assisting directors, and driving SAG vehicles. If you can only work one day, that's OK too. Dinner in Florence, SC on Saturday night at Baden's Family Restaurant. Circle September 18 and 19 on your calendar for the MS-150. It's two days of fun and amateur radio, with over 2,000 cyclists who are counting on us.

We also have a training ride coming up on August 7th. 5 or 6 HAMs are needed for that event, which will begin at 8:00 AM at Knights Castle in Fort Mill. If you can help, sign up at the July meeting.

It is that time of year again. Annual member-



**Like to use the
transceivers in the
Club Room at the
Red Cross Building?**

**Talk to John White,
WB2NHQ, at the
next meeting, about
obtaining a key.**

**Volunteer Net Controllers
needed for the Metrolina
Emergency 2-mtr net.
Contact Jim Payne,
n4jbp@arrl.net, Net Mgr.**



The Birth of A Repeater

by Earl Fortner - K4KAY

I have had an interest in radio since somewhere around 1947. My mother had a Philco Cathedral radio that was probably made in the early 1940's. As I grew older, I acquired a console type radio that had short wave bands and I just could not get enough of listening to the various bands. You could get foreign broadcast as well as ham radio. Everything was AM at that time and with a wire 50 feet or so tied to the antenna reception was excellent. You could also listen to the police in Chicago on the upper end of the broadcast band somewhere around 1700 kHz which we called Kilocycles back then. I did a great deal of experimenting with antennas and radios in my teens. I recall having a Zenith AC/DC radio. The AC/DC radio had one side of the chassis tied to the AC line. This particular radio had a loop antenna and trying to make the reception better I attached a long wire to the loop and then proceeded to attached a ground. Guess what, a small explosion and a radio going up in smoke and me trying to get away from it. The house did not have circuit breakers and could have had a penny behind the fuse. If that doesn't ring a bell ask your parents about a penny in a fuse box. Anyway I lived to tell about it and my experiments continue to this day. In high school I built a one-tube oscillator for a science project and had a local ham give it his approval. That was my first real introduction to ham radio and I began learning code shortly after that. The rest is history and after upgrading from novice to general I, built an AM rig and used a surplus ARC5 receiver. In mid 1960 I moved to Charlotte and the W4BFB club had a repeater on 146.34/94. I could be wrong but I believe Bob Southworth, Mr. KI4YV, was responsible for getting this on the air. Most of the folk were using Motorola trunk mount radios that used tubes and vibrators. They were big and heavy and if you did not run the motor while using it you could end up with a dead battery in a short period of time. Things have come a long way with a handheld radio having better sensitivity and selectivity than the old trunk mount radios. I retired in 2001 and with a little more time on my hands I decided it might be nice to have my own repeater on 70 Cm before all the frequencies were gone as is the case on two meters. Having worked in the two-way radio business 30 years I had accumulated equipment I could use

to build a 440 MHz ham repeater. In March of 2002 I applied to the southeastern Repeater Association for Coordination of the frequency of 444.400.

Approximately one year later I received my coordination on the frequency of 444.350/449.350. It takes a while as the coordinators in North Carolina, South Carolina, Tennessee, and Virginia each have to research the frequency and tones to make sure there is no conflict between other repeaters on the same frequency. This done, it was time to build the repeater. A Kenwood TKR-820 commercial repeater was part of my collection and with a complete alignment it had good sensitivity and power output on the 440 MHz ham band. So far I have not spent any money, but a repeater controller was needed and after a little research I chose the CAT-200 controller due to it's simplicity and relative low cost. The interface to the Kenwood repeater was not difficult. Having a 500-foot tower at my disposal was also a big plus. I had a 800 MHz antenna with a 1 5/8" feedline that was no longer being used. The 800 MHz. Antenna was replaced with a Decibel Products DB420 8-bay, dual exposed dipole with 9.2-dB omni directional gain. Those of you new to ham radio might wonder how you can receive and transmit at the same time with only one antenna. This is done with a duplexer that is nothing more than four cavities that provide isolation between the receiver and transmitter. Two of the cavities are tuned to the receiver frequency and the other two are tuned to the transmitter frequency. With the output of each set of cavities connected together with a Tee-Connector and the center of the Tee connected to the transmission line. Each set will isolate and reject the opposite frequency. Without the duplexer two antennas and two transmission lines with some vertical separation of the antennas would be required. With all of this done Shawn Goodin, K4RSG, assisted me with programming and installing the repeater at the transmitter site. We had a ball checking the range and making adjustments. At this point the repeater output was 20 watts with 5 watts loss in the duplexer. The transmission line has .50 dB loss per hundred feet for a total of 2.5 dB that would leave us with approximately 8 watts at the antenna.

Continued on Page 3

Continued from Page 2

The antenna gain was 9.2 dB and would make the effective radiated power somewhere in the vicinity of 60 watts. You hams with the engineering degrees will probably pull out the slide rules and say I am way out of line but that is my educated guess. The repeater is coordinated for 100 watts output and an ERP of 375 watts. I have since installed an RF amplifier on the repeater boosting the output to 60 watts into the duplexer which made the signal brighter in the fringe areas. Plans are to boost it to 100 watts in the future and perhaps install a another antenna with a tower top preamplifier which would equally boost the receive signal. That could possibly be a mistake allowing KA4WYC to be able to access it with a handheld inside the tire plant and lead to a meltdown of the repeater. Pictures of the 444.350 repeater have been included along with the 146.94 repeater that is located at the same site.

There is now a group of hams in the Charlotte area experimenting with 900 MHz and I have submitted a coordination request to SERA for the frequency of 927.6125 MHz so stay tuned.

If anyone is wondering what it would cost to start from scratch and put a repeater on the air using all new equipment. Plan on approximately \$1000 for an antenna, \$15.00 per foot for transmission line, \$300.00 for the transmission line connectors, \$1200 to \$7000 for a commercial repeater depending on brand, \$1200 for a duplexer, \$200 and up for a repeater controller. If you are not discouraged yet consider \$500 per month for tower rental plus a phone line if you want an autopatch. You would also need to hire a professional tower crew to erect the antenna and hang the transmission line. Set aside \$3000.00 for the tower crew. Now if you are a good scrounger and haggler seeking good used equipment you can do it at a fraction of the above prices; but the tower site or building top will probably be your biggest obstacle.

Putting 444.350 repeater on the air has been time consuming but enjoyable. It has also been rewarding to hear others use it. Plans are to improve it as time goes on.

Earl Fortner - K4KAY



The **444.350** repeater. The Kenwood repeater is sitting on top of the 19 inch rack. From top to bottom in the rack are the wattmeter, duplexer and controller. **NOTE:** A **118.8** tone is required to access the repeater.



The **444.350** repeater on the workbench with the controller on top.



The **146.940** 2-mtr. repeater belonging to W4BFB.



The top of the **444.350** antenna is 490 feet above ground. The horseshoe devices are used to discharge static electricity.

Field Day - 2004

Field Day, on June 26 & 27, was great fun. We had lots of folks turn out. Three stations were in operation, from 2pm Saturday and included a SSB station, a CW station, and a Digital station.

But before we could operate the tents had to be erected, the trailer had to be moved into place, the radio equipment had to be set up and the antennas erected.

Perhaps the best of the event was the camaraderie between the Hams present. I got to meet several people I hadn't met before. Everyone who asked to operate had his or her chance. Rain was not a factor on Saturday or Sunday.

A summary of our activities has been sent to the ARRL by Ben - WB2RHM@arrrl.net. Go to: http://www.arrrl.org/contests/soapbox/index.html?con_id=68&call=w4bfb and see our "Soapbox" entry.

A note of thanks to all those who attended, helped to setup, operate, log, fix food, and be generally helpful during the two day affair.

The following photos were taken as the yagi antennas for the SSB operation was raised. Thanks to Paul Ponak - AD4IE.



Field Day Summary - Compiled by Ben WB2RHM

ARRL Field Day Entry Form

Call Used: W4BFB **GOTA Station Call:** (none) **ARRL/RAC Section:** NC **Class:** 3A
Participants: 25
Club/Group Name: Mecklenburg Amateur Radio Society
Power Source(s): Generator
Power Multiplier: 2X

Bonus Points:

100% Emergency power	300
Media Publicity	100
Set-up in Public Place	100
W1AW Field Day Message	100
Site Visit by invited served agency official	100
Submitted via the Web	50

Total Bonus Points **750**

Score Summary:

	CW	Digital	Phone	Total	
Total QSOs	128	162	554		
Total Points	256	324	554	1134	Claimed Score = 2,268

Total Claimed Score (QSO points + Bonus points) = 2,268 + 750 = **3,018.**

Band/Mode QSO Breakdown:

	CW		Digital		Phone	
	QSOs	Pwr(W)	QSOs	Pwr(W)	QSOs	Pwr(W)
160m						
80m			4	100	45	100
40m	44	100	75	100	159	100
20m	26	100	83	100	255	100
15m	58	100			59	100
10m						
6m					36	100
TOTAL	128		162		554	

FOR SALE

**60' Heavy Duty Free Standing
Universal Aluminum Tower
30" Base - 14" at Top - Heavy Duty 16' Mast &
Gin Pole
Asking \$1000 Bob Thomas N4BX,
704-537-2014**

**Gap Challenger DX-VI Vertical Antenna
\$50.00
K4HRX, Paul - 704-569-2527**

Note: MARS is not responsible for condition
or usability of any of these items.

Minutes of the Last Board Meeting

**The Board of Directors met at the
Red Cross Building, on Tues., July 6, 2004**

Shawn Goodin – K4RSG opened meeting at 19:14

The following Board Members were present:

Shawn Goodin -- K4RSG Pres., Jeff Blythe – KA4WYC VP, John White – WB2NHQ Tres., Irvin Hoechner – KF4KFN, Dave Stewart – AF4ZK, Greg Onachila – KG4IOE, Scott Ellis – KG4UDX, Tom Nicholls – W4NCU. Bill Turner – W4WNT was not present.

President's Report: Shawn Goodin

Shawn advised the Board of the 5.23 repeater being moved to Emergency power on Spencer Mt. Shawn and/or Jeff shall be present for the move.

Vice President's Report: Jeff Blythe

Jason Kay - N4JCK, will present a program on the Linux computer operating system and amateur radio applications at the July 27th meeting. The August 31st program will be presented by Tim Slay, N4IB. He had to cancel for the June meeting, due to a prior personal commitment. Tim will speak on the Tower Project he installed.

Treasurer's Report: John White

John handed out several pages of the current and projected Budget. A discussion was held on the Hamfest. It was stated the Board needs to be more involved with the Hamfest and its decision-making procedures.

Committee Reports:

Public Service – Shawn spoke of the MS Dollar Rides, and the MS 150. Also discussed the repeaters we use for the MS 150, Shawn to get written permission to use area repeaters. John advised, that the Girl Scout Council will hold an event in Oct (16-17th ??) He will be bringing more information, as it is finalized. Also Discovery Place may have a kit building session for the Girl Scouts. This event will be in the Fall also.

Field Day – Most said they had a good time, except for the weather. It was stated we need to have a check off sheet to make sure the bonus points aren't missed.

Traffic reports on the HF nets showed several of the FD reports were missing or in the wrong format. A Check off sheet will be submitted to the Secretary for next year. John – advised of a need for a new tent to replace the old one. No motion was requested.

Newsletter – Tom stated he needed articles for the Newsletter. He needed the material by July 14th to be published by 15th.

Nominations Committee – Shawn to appoint a Chairperson and Dave advised he would like to assist.

By Laws – As part of old business, and in the absence of Bill, a discussion of a need to 'review' the By Laws was put on hold. It will be brought up at another Board Meeting. Also discussion of Non Profit status was held.

New Business - The new Red Cross Disaster Services Center was discussed by John. A tower (for Red Cross communications) was discussed, with a conduit into the 'War Room'. Remodeling in the Main Building was discussed and the possibility of the Club Room getting a new ceiling. The monies have already been approved, from last year's budget. John will look more into this with Building Services.

Hamfest – This was again brought up. Cost vs. Profit. A long discussion was held. A discussion of area buildings that could house our Hamfest. Cost of parking seemed to be at the top of the discussion.

Christmas Party – Dave stated he will see that the Party site and tickets are in order, but advised he didn't have anything to do with the Entertainment, Door Prizes or Awards, etc. Shawn and Jeff will work on that.

Other Business:

A discussion was held on Mutual Funds and a concern if we need to keep them or not. Other methods were discussed.

A motion was requested and seconded to adjourn the meeting. Meeting ended at 21:12

Respectfully submitted by Jeff Blythe, KA4WYC.

W4BFB - Mecklenburg Amateur Radio Society - Membership Application

New Membership Membership Renewal Information Update

Individual (\$20.00 per year) Student/Associate/65+ (\$14.00 per year)

Family Membership (all hams in family, one price): \$25.00 per year Family over 65:\$19.00

Name Address

City State Zip Code

Home Phone Work Phone (optional)

Callsign(s) Class Expiration

Occupation/Company (optional)

ARRL Member? YES NO Do you have a Club room key? Number

Newsletter Delivery Choice: U.S. Mail Internet E-mail

Internet E-mail or Packet Radio Address

Other Clubs: ARES: W4CQ: CDXA: UCARS: Other:

Membership in the Society is open to every person interested in Amateur Radio, whether he or she is a licensed Amateur or not. Each member or family is sent a monthly newsletter, and each licensed Amateur member may operate Club equipment following checkout.

The Club holds a regular meeting monthly (except December) on the last Tuesday at 7:30 P.M. We meet at East Baptist Church on Monroe Road in Charlotte.

Any licensed Amateur 18-65 may become a FULL MEMBER by paying a fiscal year (July 1 - June 30) membership fee of the lesser of \$20.00, or \$2.00 per fill month remaining in the then current fiscal year. Any licensed Amateur OVER 65 may become a FULL MEMBER or any licensed Amateur UNDER 18 may become a STUDENT MEMBER by paying a fiscal year (July 1 - June 30) membership fee of the lesser of \$14.00 or \$1.50 per fill month remaining in the then current fiscal year.

Any unlicensed person may become an ASSOCIATE MEMBER by paying a fiscal year (July 1 - June 30) membership fee of the lesser of \$14.00 or \$1.50 per month remaining in the then current fiscal year.

With the submittal of this registration, and appropriate fees, I do hereby agree to abide by the By—Laws and Standing Rules of the Society as well as the rules and regulations of the Federal Communications Commission.

Signature Date

Version: 4/24/2004

**Make checks payable to Mecklenburg Amateur Radio Society, Inc. and send to:
Bill Turner, W4WNT, 4000 Horseshoe Bend, Weddington, NC 28104**

Date Entered: **Check Number:** **Amount:**

Mecklenburg Amateur Radio Society, Inc. - Officers and Board of Directors -2004:

President - Shawn Goodin, K4RSG, Email Address: k4rsg@w4bfb.org

Vice President - Jeff Blythe, KA4WYC, Email address: ka4wyc@w4bfb.org

Secretary - Bill Turner, W4WNT, Email Address: w4wnt@w4bfb.org

Treasurer - John White, WB2NHQ Email Address: wb2nhq@w4bfb.org

Directors - Irvin Hoechner, KF4KFN; Greg Onachila, KG4IOE; Dave Stewart, AF4ZK;
Scott Ellis, KG4UDX; Tom Nicholls, W4NCU

Meetings @ East Baptist Church, 6850 Monroe Road (next to East Mecklenburg High School, near Conference Drive) - Last Tuesday of each month at 7:30 P.M.

Clubroom - Red Cross Building, 2425 Park Road, RM 023, Charlotte, NC - No telephone.

Club Repeaters**W4BFB Web Site**

146.34/146.94 With/Autopatch. 144.69/145.29 NO Autopatch
449.60/444.60 NO Autopatch and P/T 100.0
222.80/224.40 NO Autopatch
Autopatch Access *(don't unkey)+phone number. Disconnect #
145.01 Packet Digipeater, W4BFB-1

<http://www.w4bfb.org>

Webmaster: Wayne Setzer - WB4BXW
<wsetzer@att.net>

Next Meeting - July 27, 2004

August Meeting - August 31, 2004

MARS News
Tom Nicholls, W4NCU, Editor
4004 E Providence Rd.
Charlotte, NC 28211
w4ncu@att.net