

# ZERO BEAT



**MONTGOMERY AMATEUR RADIO CLUB NEWSLETTER**

**ESTABLISHED 1938**

**3<sup>rd</sup> Quarter 2006**

## MARC CALENDER OF EVENTS

**MONTHLY CLUB MEETING** every 3<sup>rd</sup> Monday 7:00 PM  
American Red Cross 5015 Woods Crossing Dr.

**FELLOWSHIP BREAKFAST** every Saturday preceding the  
monthly club meeting at Flip's on the corner of Perry Hill Rd. &  
Atlanta Hwy at 8:30 AM

## FCC EXAMS

**ARRL** Last Saturday each month at 1:00 PM at  
American Red Cross, 5015 Woods Crossing Dr.  
**For Info** contact Scott, W4SPA (334) 262-0412  
Or email (w4spa@arrl.net)

**CAVEC** every 2<sup>nd</sup> Monday at 6:30 PM at American Red Cross,  
5015 Woods Crossing Dr.  
**For Info** contact Steve, K4NM ([padgett@jschool.troy.edu](mailto:padgett@jschool.troy.edu)) or Jim  
KR4JY ([jeiland@knology.net](mailto:jeiland@knology.net))

### Additional Exam Info:

<http://www.arrl.org/arrlvec/examsearch.phtml?State=AL>

## Club Nets

**Central Ala 2 meter Net** on 146.84 at 8:00 PM every Sunday night.  
A controlled net with information about amateur radio subjects  
including information bulletins, hamfest info, satellite info, local  
club info. Net manager Clay, KC4YAU.

**Skywarn/Emergency Net Golf** Thursday at 7:00PM on 146.84.  
Net manager Mark, WB5NMZ.

## D-Star® info and Field Day Results inside

## 2006 Officers

**President:** W4SPA-Scott Poole  
**Past Pres:**  
**VP:** KG4PNL-Rick Seeders  
**Secretary:** KG4MIQ-Tim Dixon  
**Treasurer:** K4APG-Paul St. John  
**Publicity:** KI4CSQ-Shaun Thomas  
**Trustee:** WD4JRB-Stuart May  
**Trustee:** K1AZE-Lew Nyman  
**Trustee:** K4OZN-Phil Salley  
**W4AP Trustee:** K4TK-Tim Moore

## Local Repeaters

146.840(-) W4AP Wetumpka  
146.920(-) W4AP Eastdale  
147.180(+) W4AP Baptist Tower (Autopatch)  
444.5(+ ) W4AP Wetumpka--Linked to IRLP 100 Hz  
53.350(-) W4AP Baptist Tower 100 Hz  
444.450(+) WD4JRB Baptist Tower 100 Hz  
(Echolink Node 212144)  
446.450 (Splx) IRLP (4845) Baptist Tower 110.9 Hz  
147.200(+) KE4LTT Friendship 107.2 Hz  
444.575(+) KE4LTT Friendship 100 Hz  
147.380(+) W4KEN Santuck  
145.690 Simplex Packet BBS  
144.390 Simplex APRS



## From the President's Shack

By Scott W. Poole, W4SPA

Summer is most definitely upon us, and with records temperatures too. I hope everyone is having a safe and radio-active Summer. There's a lot going on with the club this summer, as usual.

Last month, Mark, WB5NMZ, led the MARC Field day event and I'd say it was a complete success. We had well over 60 members and interested friends show up over the weekend to check out the festivities. WAKA and The Montgomery Advertiser both came and gave us some much-appreciated publicity. Greg Sarratt, W4OZK, the ARRL AL Section Manager brought a digital D-Star repeater and a portable tower trailer out to the field day site for demonstration. Fred Springall, KR4YK, not to be outdone, rolled in with a brand new EMA communication truck and it's associated generator. Once again, this year, we're in the black financially for Field day. First, due to the generosity of local businesses who generously donated 150 gallons of gasoline and drinks and secondly, to all of the members who bought F.D. T-shirts. T-shirt sales covered all of the costs of this year's event. I would be remiss if I didn't especially thank Randy, Carla, Anna, Carrie, Charlotte, and Rebecca Sedlak for once again allowing us to invade their home and set up our radio equipment for Field day. Overall, the MARC 2006 field day event was a huge success!

During the July club meeting, we discussed the possibility of MARC procuring a digital D-Star repeater and setting it up here in Montgomery as part of a digital statewide linked repeater system. This statewide system is one of the goals of our ARRL Section Manager and his plans call for one of the repeaters to be located here. A D-Star research committee has been formed and their charge is to investigate our options and the associated costs of having such a system. Another of their tasks is to investigate funding sources. The committee is expected to meet and to report back to the club at a regular meeting within the next couple of months. D-Star is an interesting and exciting new technology to the amateur radio market. It holds much promise and I look forward with great anticipation to the committee report. Stay tuned for more! Also, during the July meeting, it was decided that it's time for the club to purchase some new computers. A small group of members have been tasked with making the purchases.

Some of the events coming up soon are the Huntsville Hamfest on August 19-20 and the Boy Scouts Jamboree On The Air (JOTA) October 21-22.

Well, that's all for now from here. I hope to hear all of you on the air or see you at a meeting soon!

73,  
--Scott



W4OZK, Greg and KA4KUN, Jay set up a demonstration of the Icom® D-Star® at our Field Day site on Saturday afternoon. This is the basic setup for a repeater. It contains a 2 meter, 440 mHz, and a 1.2 GHz digital repeater system. A portable tower mounted on a trailer, which could be extended, was also demonstrated as part of a movable system that could be set up anywhere it might be needed for emergency communications. Internet capability was also included with a Starband® satellite system.

*Editor: More on D-Star® on page 6*

*Zero Beat is published by the Montgomery Amateur Radio Club.*

*Editor, N4AU. Hard Copy, W4MF and KU4PY.*



### **Southeastern Division Leadership**

**Director**--Frank M. Butler Jr--W4RH-- w4rh@arrl.org

**Vice Director**--Sandy Donahue--W4RU-- w4ru@arrl.org

**Assistant Director** --Alabama--Rik Doll--KU4PY--ku4py@arrl.net

**Section Manager**--Greg Sarratt-- W4OZK-- w4ozk@arrl.org

**ARRL Alabama Section Cabinet at**

**Ala Section Web Page** [www.arrl-al.org](http://www.arrl-al.org)

### **League Notes**

*By Rik Doll, KU4PY  
ARRL Assistant Director  
Southeastern Division*

## **Once again we need to acknowledge the passing of our fellow HAMS who are now Silent Keys:**

**Lloyd Vernon Julian, W4CJA**  
**Robert Francis Allen, WA5QAC**  
**Philip Brian Witt, W4IMM**  
**73, SK**

A recent article in the ARRL Newsletter, reminds us of the necessity for keeping a current mailing address in the FCC data base. In this article, the FCC cites many occasions where they attempted to contact Hams involved in one form of rule breaking or another such as: malicious interference, etc. The citations for this misconduct were either returned by the Post Office or ignored by the recipient. In either case, the FCC can only assume they have an incorrect address and take the appropriate action specified by FCC regulations. The Director of the FCC Spectrum Enforcement Division, Riley Hollingsworth, notified the parties involved that their tickets were suspended for the remainder of the license term, or until they provided the FCC with a current mailing address. Hollingsworth cited §97.23 of the Commission's Amateur Radio Service rules that requires each license grant to show the licensee's correct name and mailing address. The rule provides that "revocation of the station license or suspension of the operator license may result when correspondence from the FCC is returned as undeliverable because the grantee failed to provide the correct mailing address." Don't let this happen to you. Make sure the FCC can find you if the occasion should ever occur.

*Editor's note: To check your current address on the FCC database go to:*

<http://wireless.fcc.gov/uls/index.html>

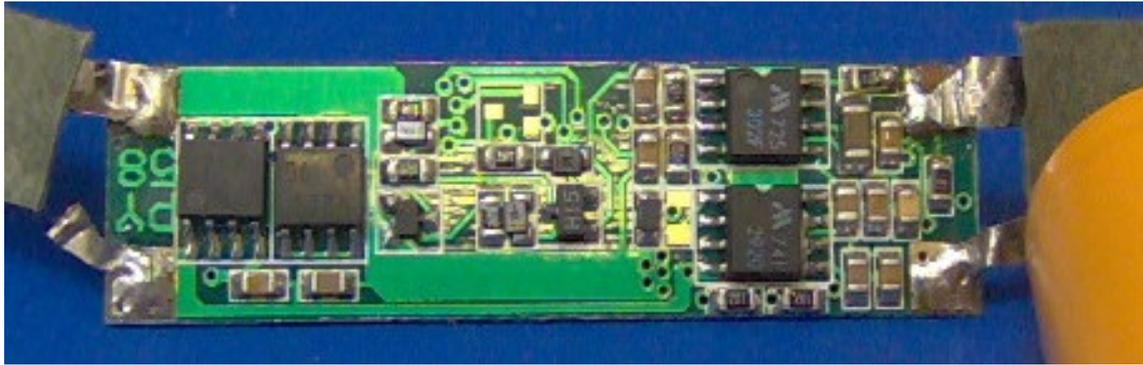
*And do a license check on your callsign. Click on the link to your callsign when it is displayed and the details will be shown.*

A new word to add to our vocabulary: INFRAGARD. An FBI program, InfraGard is dedicated to promoting dialogue between the private sector and the federal investigative agency "concerning critical infrastructure protection issues." Amateur Radio's value as one component in a cooperative effort to protect critical national infrastructure was the focus of an InfraGard "Communications Interoperability and Ham Radios" summit this week in New York City. Mary Hobart, K1MMH, and Affiliated Clubs/Mentor Program Manager Norm Fusaro, W3IZ, represented League Headquarters at the gathering. There was a great deal of interest in Amateur Radio's ability to provide emergency communications in times of national disaster. Check with the ARRL home page and keep listening for more on INFRAGARD.

*Ed. Note: Following courtesy ARRL, Newington, CT*

**ARRL Certification and Continuing Education course registration** (Jul 26, 2006) -- Registration remains open through Sunday, **September 3**, for these ARRL Certification and Continuing Education ([CCE](#)) online courses. Classes begin Friday **September 15**. Amateur Radio Emergency Communications Level 2 ([EC-002](#)), Amateur Radio Emergency Communications Level 3 ([EC-003](#)), Antenna Modeling ([EC-004](#)), HF Digital Communications ([EC-005](#)), VHF/UHF -- Life Beyond the Repeater ([EC-008](#)) and Radio Frequency Propagation ([EC-011](#)). These courses also will open for registration Friday, September 1, for classes beginning Friday, October 20. To learn more, visit the [CCE](#) Course Listing page or [contact](#) the CCE Department. [Link to this story http://www.arrl.org/?artid=6628](http://www.arrl.org/?artid=6628) .

**Montenegro DX Festival 2006 Shifting into High Gear** (Jul 25, 2006) -- Montenegro DX Festival 2006 -- the on-air event celebrating the tiny Balkan nation's independence and its status as a new DXCC entity -- is poised to shift into high gear this week. As of 0800 UTC on July 24, the 4O3T team had already logged more than 30,000 contacts. [Full Story](#)  
<http://www.arrl.org/news/stories/2006/07/25/100/?nc=1> .



## Battery Chargers

By Wiely, KE4LTT

In the last issue we introduced the smart charger concept, in this issue we go into more detail. A smart charger is a charger that uses more than simple electronics. An inexpensive charger is just a voltage placed across an individual cell or string of cells (battery) and charge current depends on the voltage difference between the charger and “chargee”. There are quite a few variations in charger designs.

A smart charger can determine charge current based on many factors. It can be current limited, voltage regulated or a combination of both. It could take in account the battery temperature and not charge a hot battery or reduce charge. Different cell chemistries and uses determine which factors to take in account. A high rate quick charger will produce a high charge current that will make a NiCad pack heat up quickly but will have a temperature sensor. It will shut down when hot to prevent cell leakage or even possible explosive hazard. High rate charging can reduce useful battery life. The manufacturer will document charge rates versus temperature. The rate must be reduced when hot.

Some smart chargers start with a constant current regulation and when the voltage reaches a certain point (typically above float voltage to equalize string) it shuts off and turns on “ready” light. It might not shut off completely, it could reduce current by a factor of 20 or more going into a trickle mode.

-Why trickle mode?

Ever seem like a HT battery worked great when you pulled it off the charger but three days later, and with out being used it was all but dead? The answer is the battery is drained by leakage current. As cells age their leakage current increases. Think of it for example as a 10K ohm resistor across each cell. Trickle current that is equal to or greater than leakage current will keep the battery “topped off”.

Do you remember how there can be a smart equalizing charge by a car alternator? The lead acid car battery can have deposits build in the bottom of each cell and when it starts touching the plates you have leakage current. On a side note here, deep cycle marine batteries are said to have less killer deposit build up that can quickly occur during deep discharges; IE run totally dead. The lead plates that are heavily eroded into the acid solution will not completely replat when charged.

On the practical experience side-

Charging batteries with a variable voltage/current power supply I have noticed that when fully charged, a gel cell or a NiCad battery will let the voltage rise way above the float

voltage requiring little or no current – [remember exposing the cells to higher than float voltage will shorten battery life]

Here is where we start getting smarter-

We have been talking about a nice steady charge current.

The charge current can be regulated charge pulses. The voltage will rise with the pulse. The higher the charge state, the higher the voltage will rise with each pulse. You can have in a smart charger one of these circuits per cell. Lithium Ion charging requires this individual attention.

One other application is charging while equipment is being used. This complicates the situation. You must be able to supply current to charge plus current to run device. It can extend charge time required.

One example of where this does not work is the VX5R charging wall transformer. The 12Vdc, 500ma wall supply does not have enough current to charge and transmit. The radio takes a voltage dip and resets. It will monitor and charge however. So as you see the control of voltage and current can be controlled in various interesting ways. I could start for one minute high charge, and depending on voltage or temperature one minute, go to trickle or start pulsing. Turn off when current pulses get a certain voltage rise. If the battery stays on the charger for 20 days it will run a 2 minute pulse charge cycle and wait for another 20 days. All of these variables can be programmed into a smart charger in a tiny chip that runs driver FETs that controls current and voltage regulators. It could record charge cycle history for the battery and change parameters as the pack ages. Use your imagination looking at the photo above. This shows the connections that went to a two Lithium Ion cell string in a VX5R battery pack. Three connections total; one on each end and one in the middle in between cells

Back to a central theme- this is now software in a battery that can even be interlinked to the radio circuitry. This can allow copyright protection by rejecting a non-Yaesu battery.

## Field Day 2006

By WBSNMZ Mark

Field Day 2006 is a wrap! As we all know, the true mission of Field Day is to demonstrate our ability to setup/operate in remote environment under austere conditions and support local disaster preparedness agencies, and the Montgomery Amateur Radio Club proved its capabilities in style again this year.

This is the pivotal event for our 150 member club -- lots of great food, fellowship, and general "hamming." We again operated W4AP in the 2A category, making contacts on the traditional SSB and CW modes, adding satellite (AO-51 via a handie talkie) and digital (PSK31) modes this year. We had an opportunity to demonstrate the D-STAR concept in operation, with a deployable node provided courtesy of our Section Manager, W4OZK. Additionally, one of our served agencies, the Alabama Emergency Management Agency, brought their state-of-the-art comm vehicle (one of a fleet of eight), designed to provide on-the-scene communications and interoperability in emergency environs.

I appreciate the efforts of you who came out to help with the setup, operation, and teardown. It was 100 degrees during this year's setup (and not much cooler during teardown) -- having lots of folks helping sure made a difference!

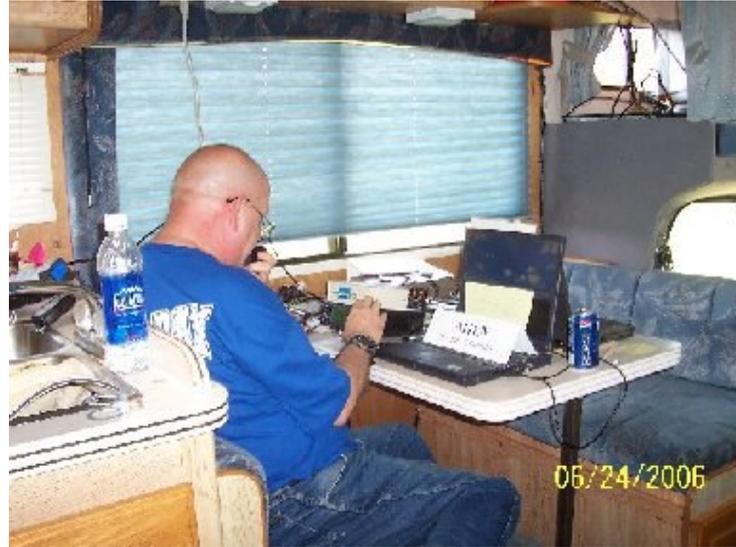
Our final score was 3482 points. Here's the breakdown:

- Phone: 678 contacts (incl GOTA)
- CW: 526 contacts
- Digital: 4 contacts
- Bonus points items
  - Submitted results via web
  - 100% Emergency power
  - Public place
  - Info booth
  - Copied the Field Day message on RTTY and AMTOR
  - Made 5 contacts using solar power
  - Had 3 technology demos (we actually had a lot more, but only get credit for a max of 3)
  - Had 2 "served agency" members visit the site (NWS and AL EMA)
  - Originated a message to the SM
  - Made 3 satellite contacts via AO-51
  - Obtained media coverage from WAKA and the Montgomery Advertiser
  - Lots of young operators supervised by a full-time GOTA coach

Propagation wasn't the best this year, but 20 meters stayed open all night and we even got a few hours of 15 meter operation Saturday evening. We had 49 hams sign the log book, plus 13 visitors. For those of you who stopped by Saturday afternoon, it was pretty much "standing room only" -- exactly what we like to see! Lew's famous chili was a crowd pleaser again this year. Thanks to Lew, Anita, and all the others who brought food/drink to Field Day.

If you took any digital photos of Field Day, please send me a copy via e-mail and we'll post them on the [www.w4ap.org](http://www.w4ap.org) web site for everyone to enjoy.

Thanks again for your support!



AI4KN, John at the GOTA station



Phone station Bryan K4GDW Mike KB0OLA



N4AU, Bobby at the CW station

## Is D-Star® For You?

By K4IZN, Mike-- k4izn@arrl.net

D-Star® is the name for a digital radio mode that is appearing on the 144MHz, 440MHz, and 1.2GHz amateur bands. It is capable of digital voice communications on all three bands. It also can employ low speed data communications on 2M or 70CM and high speed data on L band. D-Star® radios can communicate directly with one another but they really do their stuff when used with a D-Star® digital mode repeater system.

In many ways the digital voice mode (DV) communications is very much like ordinary FM. There is a slight sacrifice in audio fidelity as compared to FM but there is absolutely no noise received...ever! Most of the time if a signal can be copied it is almost perfect. Otherwise it isn't there at all. There are some instances though when a signal is exactly on the margin of dropout and WIERED sounds burp out of the speaker. Some of the guys call this "going digital". It sounds a little like a hard rock guitar going into feedback. I'm glad it doesn't happen too often.

The differences a D-Star® radio operator encounters is mostly in the setup of the transmitter. You can't just select a frequency and begin transmitting. Well, I guess you could if you don't want anyone to hear you. The TX setup consists of 5 principal attributes. These are listed below:

- 1) Select the desired frequency. (exactly as with FM)
- 2) Program your station callsign into one of several memories labeled "MYCALL".
- 3) Program the callsign of the station you wish to talk to into one of several memories labeled "YOURCALL". If you want to talk to anyone who may be listening you must enter CQCQCQ for "YOURCALL".
- 4) Program the callsign of the repeater you want to use to access the D-Star® system (transmit to) into one of several memories labeled "RPT 1". NOTE 1: This is the local repeater. It will always repeat your signal on its output frequency. This entry is left blank for simplex operation.
- 5) Program the callsign of any other D-Star® system repeater (that you want linked) into one of a group of memories labeled "RPT 2". This entry can be left blank if you do not want to be linked to another repeater.

NOTE 2: D-Star® repeaters use their callsign plus a SSID that is commensurate with the band it operates on. Alpha characters are used for the SSID as follows:

- A denotes a 1.2GHz repeater
- B denotes a 440MHz repeater
- C denotes a 144MHz repeater

Example: W4AP C would denote the club D-Star® 2M repeater.

Now look back to step 5 above. If you are on 2M and want to be linked to the club's 440MHz repeater, even if it is at the same site, you must enter W4AP B for "RPT 2". This same method can be used to link to a D-Star® repeater in Tokyo, if you know the callsign and can speak Japanese!

WHAT??? I HAVE TO DO THIS EACH TIME I WANT TO HAVE A DV QSO?

Well...Yes and No. This is where the radio's memory bank really comes into play. Each attribute is stored in its sub memory bank and can be combined with the other attributes to form a setup. This setup can then be assigned to one of the 500 channel memories in the radio. So anytime you want to talk to anyone on the local 2M machine you simply select the channel memory where those attributes are stored.

Hmmmm....If you look at the setup and use your imagination you will quickly begin to see how versatile digital radio can be. If you placed N4AU into the "YOURCALL" sub memory rather than CQCQCQ,

then you will ONLY HEAR BOBBY! You could also set up an exclusive chat group if each member uses the same alias for both the "MYCALL" and "YOURCALL" entries. Think about the possibilities, they are almost endless. Specific Station calls, paging, net announcements, etc.

D-Star® digital text communications is keyboard to keyboard through a PC connected to the radio accessory connector. Any terminal program such as Hyperterminal can be used. Data is transmitted each time the <ENTER> key is depressed and it is routed just as with DV.

There is also a D-Star® gateway to an APRS reporting site. I have not used this feature, but all that is required is a GPS receiver connected directly to the radio accessory connector. The GPS must send NMEA compliant data via RS-232 at 4800 N-8-1. The radio transmits the data which is relayed to the APRS system via a repeater gateway. It is worth noting that you can use position reporting and voice simultaneously. Both codes appear in the transmitted bit stream. The position report can also be read directly by any D-Star® radio that has an adequate display. (Some don't, most do) Reading these position reports on the small radio screen while driving is a sure way to have an auto accident.

Speaking of displays, the callsign of each station you hear is displayed on your radio. A short (max 20 character) text message can also be sent with the callsign for name, QTH, etc. Anyone who kerchunks the repeater will have his callsign repeated. These features give a repeater custodian quite a bit of control over who can use the machine and how it may be used. Sending the callsign also satisfies the FCC ID requirement, but most users continue to ID just as they do on FM.

D-Star® radios transmit information in packets. Each packet contains all 5 of the setup attributes discussed above plus the content of the message. These digital packets are created in the transmitter immediately following the microphone amp and they are not decoded until they reach the destination receiver's audio stage. The packets are constructed in a format that is compatible with IP, TCP/IP, and are therefore easily routed over LAN's and internet gateways. All communications between D-Star® equipment utilizes this format. Analog FM receivers produce a low level hissing sound when tuned to a D-Star® transmission. Only D-Star® compliant equipment will decode the signal.

ALL THIS SOUNDS OK SO FAR. WHAT IS THE BAD NEWS?

I guess the cost of D-Star® equipment is its biggest drawback. At present only Icom markets D-Star® but this is an open system and other manufacturers are sure to follow. Until competition starts to control price, expect to pay about twice the cost of an equivalent FM radio. All the D-Star® equipment at present will also operate FM so you are getting two radios in one box I guess, but it is still expensive. I paid \$630 for a dual band mobile, an ID-800H. I recommend spending another \$100 for a cloning cable and software. This makes programming all those memories a snap. Trust me....it isn't a snap using the mike and panel buttons, but it can be done that way.

The Montgomery area DOES NOT have a D-Star® repeater. Unless MARC elects to support a D-Star® repeater system you will not have too many folks to talk to for now. I work through repeater systems in Tuscaloosa and on Cheaha Mt. from my QTH in Holtville. There are only about a half dozen users on each of these machines. They are mostly technical types who are installing and getting the bugs out of the equipment. I see this changing daily and several hams are awaiting delivery of D-Star® radios. There are three other D-Star® repeaters in the state. Two are in Huntsville, and one is in Mentone. There are also several other systems in Texas, California, and the New England states.

SO WHAT'S NEXT?

D-Star® is really in its infancy. It is being advertised as the amateur radio mode of the next generation. That may be so, but for the next generation to use it, this generation will have to stand it up! I hope MARC will take on the D-Star® challenge and join the most technically advanced clubs in our hobby today. To do so will require a true pioneering spirit and serious financial commitment. Is D-Star® for you?

# MEMBERSHIP APPLICATION

Year \_\_\_\_\_

Montgomery Amateur Radio Club – PO Box 3141 – Montgomery, AL. 36109

**Renewals** enter, name and callsign and any changes in status.

**\*Note: Senior Members** over 70 please send in application to keep roster updated.

**New Members** enter all available information.

Name: \_\_\_\_\_ DOB: \_\_\_\_\_ Call: \_\_\_\_\_ Class: \_\_\_\_\_ ARRL Member(Y/N) \_\_\_\_\_

E-mail: \_\_\_\_\_

## Family Members

Name: \_\_\_\_\_ DOB: \_\_\_\_\_ Call: \_\_\_\_\_ Class: \_\_\_\_\_ ARRL Member(Y/N) \_\_\_\_\_

E-mail: \_\_\_\_\_

Name: \_\_\_\_\_ DOB: \_\_\_\_\_ Call: \_\_\_\_\_ Class: \_\_\_\_\_ ARRL Member(Y/N) \_\_\_\_\_

E-mail: \_\_\_\_\_

Name: \_\_\_\_\_ DOB: \_\_\_\_\_ Call: \_\_\_\_\_ Class: \_\_\_\_\_ ARRL Member(Y/N) \_\_\_\_\_

E-mail: \_\_\_\_\_

Class of License: N= Novice, T= No Code Technician, T+= Code Technician, G= General, A= Advanced, E= Extra

Address: \_\_\_\_\_

City: \_\_\_\_\_ State: \_\_\_\_\_ Zip: \_\_\_\_\_

Home Phone: \_\_\_\_\_ Work Phone: \_\_\_\_\_

Indicate Membership type below. Membership fees are **due every January 1<sup>st</sup>**. There is a 60-day grace period.

**Family membership** is for immediate family with 2 or more amateur radio license holders **residing at the same address**.

**Associate Membership** is for individuals who **do not have** an amateur radio license, but are interested in the activities of the club and are preparing for exams.

**Senior Membership** is for an amateur age 65 or older.

Check type of membership:

\_\_\_\_\_ Single Membership (\$20 per year)

\_\_\_\_\_ Family Membership (\$30 per year)

\_\_\_\_\_ Senior Membership - age 65-69 (\$10 per year)

\_\_\_\_\_ Senior Membership - age 70+ (no charge)

\_\_\_\_\_ Associate Membership (\$10 per year)