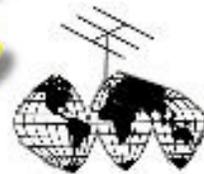


# Zero Beat



Montgomery Amateur Radio Club Newsletter

Established 1938

May 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.

**“CQ Field Day”**  
**June 24<sup>th</sup> and 25<sup>th</sup>**  
**Setup Friday**

## 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(+ ) W4JKB Santuck 88.5 Hz  
145.690 Simplex Packet  
144.390 Simplex APRS



## From the President's Shack

By Scott W. Poole, W4SPA

Summer is almost here and everyone knows what that means... **Field Day!**

Mark Wintersole (WB5NMZ) is our Field Day chairman for 2006 and is already under way making plans for this year's event. Field Day is the biggest operating event of the year, so I hope everyone will take some time from their busy schedules to come out to the Field Day site at Randy (KV4AC) and Carla's (KG4EVC) home to join us! If you need directions, surf over the club's web page at <http://www.w4ap.org> and click on the Field Day link. There you'll find all you need to know including directions and maps.

The MARC recently sponsored a General upgrade course which was very well attended. Over 20 club members that are currently Technician class licensees attended the 6 week class. Mark Wintersole and I taught the class and students studied both theory and Morse code. The class wrapped up on April 6<sup>th</sup> and several of the students have already upgraded to Generals!

Presently, there is a Technician course going on and there are over 20 students in it too! There are lots of younger folks in the class so get ready to be hearing some new KI4 calls on the repeaters soon.

The W4AP contest station was warmed up again this year for the 2006 Alabama QSO party. This year, 5 members of the MARC operated in the 12 hour event and racked up nearly 200 contacts. Mark Wintersole, MARC contest director, was at the helm again this year.

The Montgomery Amateur Radio Club's ARRL Special Service Club (SSC) status has been renewed for another 2 years. This prestigious status is granted to ARRL affiliated club's who demonstrate high standards and go the extra mile by actively participating in activities such as public service events and training of amateur radio operators.

The W4AP club station license is set to expire in July of this year but not to worry... Tim Moore (K4TK), the W4AP trustee, has already completed

the renewal application and it is speeding its way through the FCC right now.

The new [www.w4ap.org](http://www.w4ap.org) web site is about to turn 1 year old. Yes, it's been a year already. If you haven't checked it out lately, you need to. Tiny Ray, Rick, Shaun, and I, your web development team, work hard to keep the content fresh and current. So stop by often to keep up with the happenings of the club.

The ARRL has brought back the "commissions for renewals" program. It works like this: if you join or renew your ARRL membership through the club, we get to keep a portion of your ARRL dues. I will have all of the necessary forms at every meeting for the rest of the year, so just come see me at a meeting or e-mail me at [W4SPA@ARRL.net](mailto:W4SPA@ARRL.net) for more information. Please remember to renew early so you'll get uninterrupted QST delivery.

73,  
--Scott

## From the Editor

This is the last issue before Field Day so join the group and have a fun weekend operating and enjoy the camaraderie. Note the new heading designed by Tiny Ray, KT4DY. I have a couple more that I may rotate.

The tone on the 444.500 repeater has been changed to 100 Hz to make it standard with some of the others in this area. It is also connected to the IRLP via a 440 link. Access to this system is gained by keying the desired node number and disconnect is 73. The Echolink on the 444.450 machine is the same, node number and 73 to disconnect.

All articles in *Zero Beat* are formatted and edited in .doc format and printed to pdf with pdf995<sup>®</sup>. They can be displayed with the normal pdf viewer or Foxit<sup>®</sup> reader, which is very fast, uses few resources and works very well for viewing. It is a free download at [www.foxitsoftware.com](http://www.foxitsoftware.com).

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73,  
Bobby

*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*

As we all know, last years hurricane season was particularly devastating to the gulf coast and Amateur Radio was, once again, called on to provide much needed communication support. The efforts of hams throughout the country and particularly in Alabama have been cited by the Federal government, ARRL, and the states, for their numerous contributions of time and equipment. Just recently, the governor of Alabama issued "Certificates of Recognition" to the amateurs in Alabama who provided support for the Katrina Relief Effort. Many lessons were learned and the ARRL and Ham Radio community stand ready and better prepared for our next call to service. In an effort to keep our skills honed and equipment ready, we annually participate in the ARRL sponsored Field Day. This event, presented in a contest format, yields and opportunity for hams throughout the country to exercise their equipment and ingenuity in a simulated emergency environment. We can find out what works and what doesn't as well as practicing good communication protocol. We do know that there is a high probability that our services will be needed again this year, so be a participant, don't sit on the side lines. Get involved! Be prepared! CUL at field day.

**Samuel L. Schloss, WA4KIM---- SK**

*Editor's Note:* Sam was a long time member of the MARC and was active in years past. He made many contributions to the Club in his younger years.

**Field Day**

**2006: 24-25 June**

*By Mark, WB5NMZ  
Field Day Chairman*

Field Day 2006 is fast approaching and your planning committee is hard at work to ensure that this is another banner year for the Montgomery Amateur Radio Club operation. Our goal for FD2006 is threefold: (1) demonstrate our ability to operate in a deployed environment, (2) garner the highest point total of all AL

clubs, and (3) have lots of fun! We'll be setting up at the Sedlak's place south of Montgomery on Friday afternoon (23 Jun) to be ready to burn up the airways over the weekend.

There are a few minor changes to this year's Field Day rules, mostly associated with the GOTA operation, but you should expect to see things pretty much as they were last year. We'll operate W4AP in the 2A category, with one SSB and one CW transmitter. We'll also run a satellite operation, a GOTA station, and three demonstration modes (PSK31, ATV, and APRS) to garner maximum points. We'll also operate PSK31 occasionally to add to our point total. There will be lots of ancillary activities (demos, press coverage, VIP visits, etc) throughout the weekend that will help us maximize our point total.

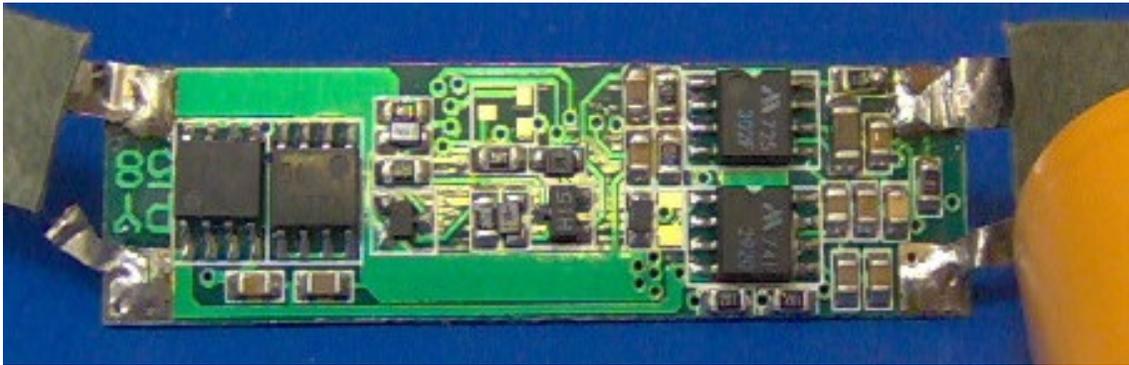
While I'm new to this position [and have some tall shoes to fill with the departure of K8AJX and KG4AIC], I'm confident that we'll have another highly successful operation...thanks mainly to the support of so many top-notch committee members this year.

Here's a list of your Field Day 2006 committee members:

Chairman: WB5NMZ Phone Station Capt: W4SPA GOTA Capt: KU4PY & AI4KN Power: K4OZN Fuels: KV4AC Food: K1AZE & KG4YWT	Ice: KG4ATW Drinks: KF4QOE PR: KI4CSQ Welcome Tent: KE4LTT T-Shirts: KD6BOD
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I plan to provide Field Day updates at the next two club meetings to keep your situational awareness high...and to allow for an open dialog in case we need to tweak things a bit.

**CQ Field Day, CQ Field Day  
This is W4AP. 2A in  
Alabama.**



## Battery Chargers

By Wiely, KE4LTT

*I*n the last issue we talked about the simple charger; a series cell string with a voltage placed across it. Here we go deeper in to the care of each cell in the string. The current in the string;  $I=V/R$  is directly proportional to voltage across the string.

$$V = V_{\text{charger}} - V_{\text{string}}$$

The value of  $R$  is the strings total resistance in ohms.

*T*he resistance increases as the cells charge and therefore the charge current decreases. So what can change during the life of a battery? Over time a cell can open or short. If open, little or no current will flow. In another case suppose a cell is shorted with the voltage across the cell being zero. This is because the cells' resistance has gone down to the single digit ohms range. Now the difference between the charger output voltage and the string voltage will be greater. The remaining cells get too much charge current, and are subjected to a higher than normal a float voltage.

*W*e also really do not know how each individual remaining good cell will take this over charge. It can overheat and damage them. The voltage across each cell may end up different. In smart chargers each cell voltage will be monitored individually. This is required of newer technology cells. If you could control the current needed in each cell you could balance the voltage of all individual cells in the string. You would have a smart charger.

*I*n the previous example of a string with a shorted cell it will be given a larger than normal charge current to try to bring the string voltage up to float voltage. A smart charger requires an electrical connection to each junction between

cells so you can individually control the voltage/current in each cell. A five-cell string charger can be thought of as five little smart chargers. The VX5R battery has two 3V Lithium Ion cells with a 7.2 string float voltage. It has connections between the cells. As shown in photo, inside the FNB-58 battery pack is a circuit board containing sophisticated surface mount components. When you buy a new battery you are paying for more than just a battery. There is also an interface between the radio and the pack. The 12 volt DC wall wart plugs into the radio, which in turn charges the battery.

*T*he radio knows and displays "charge complete" when finished. The drop in charger connects directly to the battery pack. It knows when ready and turns green. The battery contains "software" even if in a simple way such as voltage decision points and possibly a date code. This has made it rough for secondary market battery vendors. The radio can try to reject an aftermarket battery and display "charge error".

*T*he battery is claimed to charge correctly by the non-Yaesu vendor. To contain software leads into legal questions of copyright infringement over a battery!

*I* hope you understand the concept here and in the next issue we will go in to variations of smart charging.

**NOTE:** The tone on the 444.500 repeater has been changed to 100 Hz to be standard with more of the local repeaters. N4AU

## Key Klix

### Fuses

by N4AU, Bobby

**F**uses are those little devices we use to protect us from overloads on our circuits that cause fires! I ran across a discussion in a user group and thought it would be a good idea to write this up for the Zero Beat.

**F**uses are installed in line to protect our *wiring* when an overload occurs. Something shorts and causes an excessive current through the wiring that can overheat and cause a fire. The fuse is designed to open (like a switch) when the current through it exceeds its rating (amps). They burn open, which opens the circuit and the current stops.

**T**he discussion that caught my interest was “why use a fuse in the negative lead of our radio equipment?” I have often wondered that and the user discussion cleared it for me. If the radio is connected directly to the battery in a car the negative lead should be fused because it protects the wiring to your radio (and the radio) if the ground strap from the battery to the frame gets loose, or opens. Think about it. The vehicle ground system is now through your negative lead to the radio and through the radio to ground, either through the mount, or through the coaxial cable to the antenna. This **WILL NOT** carry the load from the battery to the starter, or any other power using device in the vehicle. If the lead is not fused (at the battery end) the wiring can burn and cause a fire **and** damage the radio..

**F**uses are rated in amps and voltage. Voltage? Why? The voltage rating is the arc over voltage after the fuse opens. If you use a fuse rated at 125 volts in a circuit that uses 240 volts, even if the fuse opens, it can arc and current can still be applied to the circuit. It's ok to use a fuse with a **higher voltage** rating than the applied voltage. The current rating should not be exceeded. Usually the current rating on a fused circuit is a few percent greater than the normal maximum load the circuit uses. There are also SLO BLOW fuses which can carry the initial *surge* current in a circuit, which can be greater than the operating current. These fuses will handle the excess current caused by charging capacitors etc for a few milliseconds until the circuit stabilizes. There are also “flash proof” fuses that are filled with something like sand or ceramic to prevent flashes when the fuse opens.

**R**emember, the fuse is to protect the WIRE. If you have a small wire (number 18 as example) tied from the radio fuse (maybe a 10 amp or so), feeding a TNC, don't depend on the 10 fuse to protect this number 18 wire, the wire will burn before the fuse. Install a smaller fuse in the TNC wire to protect it. If a short occurs in the equipment, the wire is the worry (fire). The damage is already done in the equipment.

**T**he fuses we use are usually the little cylindrical glass type but there are the newer automotive type or the older house plug fuses

used in some older house panels. Just remember, these protect the wiring once a short or overload occurs so if you're designing a circuit to be fused, think, fuse the **wiring**..

### The Final Courtesy

by N4AU, Bobby

**A** recently licensed ham called me a few days ago and heard me discussing QSL cards, LOTW (Logbook Of The World), logging, and eQSL with another ham. He was wondering about this since he had not discussed it with any Elmers and had not been introduced to “QSLing”.

**T**he QSL is a confirmation of a contact with another station that authenticates the contact. The QSL is used for awards and personal goals by Amateurs. They are used to confirm contacts for DXCC (contacts with 100 or more different countries) WAS (worked all 50 States), WAZ (worked all Zones), WAC (Worked all continents) etc. Some also just like to collect the unique cards from the hams they talk to. It was called in the old days “the final courtesy of a QSO”. But to properly confirm a conversation or contact you need a log to be able to authenticate the information. In old days (paranoia) we were required to log every transmission (or series of transmission in an exchange) as required by the FCC Rules and Regulations. Even each contact or transmission of mobile activity had to be logged, but after repeaters and mobile operation became very active, the logging requirements were dropped. It is still, however, a good idea to log HF activity (and other bands such as VHF and UHF if you collect grid squares, counties etc.) for QSL information. It is also a good idea for your protection, since you have written records of your on the air activity. I have a situation where my call has apparently been used by someone else (a bootlegger). I discussed this with the engineer in charge of this FCC district many years ago and he advised me to keep good logs in case some violation should occur. I have a couple of hundred QSL cards I can't confirm. It's hard to believe this is an occasional “mis-copy” of my callsign. This advice to me was also repeated by Mr. Riley Hollingsworth, of the FCC.

**T**here is some great logging software available that makes it much easier than the old pencil and paper logs which I'm sure many reading this will remember. It also makes it easier to transfer the data to the electronic servers for LOTW and eQSL. Both of these services have several million contacts recorded and can match the records for awards. Our software will gather information from the log and create an ADIF file which is a standard files used for amateur data information. One can work 100 stations and have the info uploaded in minutes.

**I**f you're new to ham radio and need answers to questions like this, ask an “old timer” and they will be more that glad to help you out.

# The A, B, C's of Amateur Radio Acronyms

by K4TK, Tim Moore

This article is intended to share the meaning of some of the more familiar (and not so familiar) acronyms used in Ham radio and the telecomm industry today. While this list is not all encompassing, it does represent some of the more frequently used terms in our hobby. Some of the acronyms you may have used frequently both in the hobby and possibly even in your professions, but never gave consideration to what the acronym itself actually means! By the way, some acronyms have multiple meanings, depending on what environment they are used

We'll start with some popular connectors. We commonly connect our "rubber ducky" antenna to our HT (whoops, that's short for Handy Talkie) with a BNC connector. This is a bayonet looking connector, and you might think the acronym stands for the initials describing the shape or appearance of the connector. But you'd be partially wrong! BNC stands for Bayonet-Neill-Concelman. Neill and Concelman were the individuals who are credited with the connector design (and of course bayonet does indeed describe the connector appearance/type).

When we talk about jacks, we often refer to connectors like an RJ-11 or RJ-45. RJ stands for registered jack. Registered by whom you ask? By the FCC, that's who! For instance, your telephone typically uses an RJ-11, which dictates a six conductor modular jack that is typically wired for only four conductors (the familiar red, green, yellow and black wires, or two pairs). Or how about the RJ-45 you might use for a LAN (oh, here we go again, that's Local Area Network for you computer types) connection to your computer. In this case, the RJ-45 specifies an 8-pin connector. These jacks can be keyed or non-keyed. Keyed means that the male plug has a small square bump on the end of the connector, and the female plug is shaped to accommodate this bump. Meanwhile, we have standards that are used for connection of devices. Devices like our computers in the shack. You might have your computer attached to a TNC to provide packet radio. The cable connecting to the TNC might be an RS-232 cable. RS stands for recommended standard. These standards are typically developed by the EIA (sorry, the Electrical Industries Association). This particular RS-232 standard (and the many other standards) defines mechanical and electrical characteristics for connecting DTE (Data Terminal Equipment) and DCE (Data Communications Equipment) data communications devices. It specifies connector pin assignments in the connector, what signals will be present on those pins, and even what shape the connector will have (originally a DB-25 in the case of RS-232, but more recently, a DB-9 has been utilized). Oh, I almost forgot. A DB-9 indicates 9 pins in the connector, while the term DB (not to be confused with db, or a decibel) was originally used to describe the housing of the connector itself. More specifically, the "D" referred to the shape of the housing. While the letter following the "D", in this case "B", originally specified the size of the housing. The letters to specify size were A, B, C, D, or E. We most often see connectors specified with the letters DB. For instance DB-9, DB-37 (used with RS-449), DB-25 (used with RS-530), etc. Recommended standards are just that, recommended. These Standards can be violated or "stretched", but it is not recommended (sorry for the play on words)! Typically, sooner or later, violating these standards will result in problems. And problems that occur when violating standards are often VERY difficult to troubleshoot! But this is a topic for an entirely different discussion we'll cover sometime in the future.

And while we're at it, let's explain DCE and DTE that were mentioned briefly above. Your TNC is a DCE piece of data communication equipment. This device, much like a regular modem

in the telecommunications world, provides or resolves issues of timing and interface between DTE devices and the circuit or network they reside in. DTE devices are the pieces of equipment in the circuit or network that acquire timing and other control signals from the DCE. For instance, your computer attached to your TNC (did I forget to mention TNC stands for Terminal Node Controller? I thought so!) acquires timing and control signals from the TNC. The computer is a DTE device. The TNC is a DCE device.

Your HT probably uses a feature called DTMF, or Dual Tone Multi-frequency. With DTMF, when you push a button on your HT push button pad, it makes a tone which is a combination of two tones.

We have AC for alternating current and DC for direct current. RF for radio frequency and RFI for radio frequency interference, which is generated (most likely unintentionally) by electronic equipment and regulated by the FCC (I'm guessing you already know this one, but just in case, the Federal Communications Commission).

Our receivers often use PLL or phase locked loop and can incorporate XIT (transmitter or xmitter incremental tuning) and RIT (receiver incremental tuning). Many filters are available in modern rigs, like PBT or pass band tuning. You probably connect to your antenna using a PL-259 (a common male radio connector) and SO-239 (a common female radio connector) to RG-58 (coax cable). You might use RG-58/U coax, where the "U" indicates general utility. If we aren't careful with our connections, we could have a significant SWR, or standing wave ratio.

You might operate an Amateur radio on HF or high frequency (3-30 MHz). Though Hams also operate on VHF or very high frequency (30-300 MHz, for instance the two meter band), listen to broadcasts on MF or medium frequency (300-3000 kHz), and operate on UHF or ultra high frequency (300-3000 MHz, for instance the 70 centimeter band).

You might operate CW or continuous wave (more commonly referred to as morse code). Or, you might enjoy talking on FM (frequency modulation) on two meters or SSB (single sideband) on HF. More specifically, you might use USB (upper sideband) on 10 meters, where only one (the upper sideband above the center carrier frequency) of the two sidebands is used by the transceiver. Or you might operate LSB (lower sideband) on 40 meters. Some folks even enjoy using AM (amplitude modulation), which was more commonly used in Ham radio in earlier years. When using a microphone, you might have to hit the PTT (push to talk) button, or maybe you'll decide to run VOX (voice operated xmission or transmission), which allows you to operate hands free.

And just what exactly is 30 MHz? MHz stands for Megahertz, which is one million Hertz (or Mc for Megacycles, as it was once referred to). Likewise, kHz stands for kilohertz, which is 1000 Hertz.

OK, had enough? I'm sure you can think of some others. So go ahead, dazzle your ham friends with your knowledge of the alphabet soup we call acronyms in our Amateur Radio hobby! And while you're at it, here's a challenge for YOU. See if you can find out the meaning of some other common acronyms we use every day. Like what does the "RG" in RG-58 stand for? How about "PL" in PL-259 or "SO" in SO-239 (no, it doesn't stand for significant other)? More than likely, when the term was first invented, chances are those letters had some meaning (could it be something as simple as PL for plug and SO for socket?). Over the years, typically nobody remembers what the letters really stood for when the term was developed. And if you figure some of these out, how about sharing them with the rest of us? So we'll all be up to speed on the A, B, C's of Amateur Radop acronyms!

# 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)

# The Montgomery Amateur Radio Club

Public Service Since 1938

Amateur Radio

[www.arrl.org](http://www.arrl.org)

[www.w4ap.org](http://www.w4ap.org)



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Montgomery, AL 36109-0141

