

# Zero Beat



Montgomery Amateur Radio Club Newsletter

Established 1938

Celebrating our 70<sup>th</sup> Birthday!

Feb 2008

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## CALENDER OF EVENTS

### CLUB MEETING

Every month - 3<sup>rd</sup> Monday at 7 PM  
American Red Cross Building  
5015 Woods Crossing Dr.

### FELLOWSHIP BREAKFAST

Saturday morning before the club meeting  
Shoney's - Eastern Blvd.  
8:30 AM

## FCC EXAMS

Montgomery ARRL VE Team: Last Saturday each month at  
1:00 PM at American Red Cross, 5015 Woods Crossing Dr.  
For information, contact Scott, W4SPA (334) 262-0412  
Or email ( [w4spa@arrl.net](mailto: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: Chris, KD6BOD

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

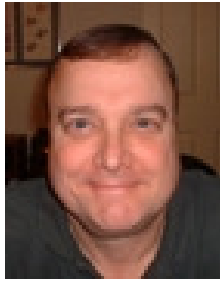
**MARC 2008 Dues  
\*\*\* Due Now! \*\*\*  
Pay by Feb 29<sup>th</sup>**

## 2008 Officers

President: Mark Wintersole, WB5NMZ  
Past President: Rick Seeders, KG4PNL  
Vice-President: Daniel McCaffery, KE5GDK  
Secretary: Chris Hall, KD6BOD  
Treasurer: Paul St. John, K4APG  
Publicity: Bruce Jenkins, K14OZW  
Trustee: Jim Eiland, KR4JY  
Trustee: Lew Nyman, K1AZE  
Trustee: Phil Salley, K4PO  
W4AP Trustee: Tim Moore, K4TK

## 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  
144.390 Simplex APRS- W2



**From the President's Shack**  
**By Mark Wintersole, WB5NMZ**

Greetings and Happy New Year! I'm pleased to report that 2008 is starting out as a busy and productive year for the Montgomery Amateur Radio Club.

KE4LTT, N4AU, KG4PNL, and yours truly spent all day on Feb 2 working to correct the 146.84 and 444.5 repeater antenna system deficiencies. Many of you have no doubt noticed that coverage of these two repeaters has been less than stellar since the tower/antennas were replaced last summer. We found that the contractor had incorrectly installed many of the antennas on the tower (not just ours) and mislabeled several feed lines (including ours). While the antennas are still on the opposite side of the tower from where they originally were, we are now using our own antennas located 130' up the tower. Initial reports are that the signal has greatly improved in many areas. Our next step will be to replace the antiquated tangle of interconnects inside the building, as we're losing almost 3 db at the feed line on both systems at this point. The State has also agreed to allow us to relocate our antennas a bit to improve coverage, but that's a project for a later date.

Earlier in January, I announced that MARC would be holding a technician licensing class in February. Unfortunately, we didn't have enough students to hold the class as originally scheduled. We have delayed our plans until 20 March, when - enrollment permitting - Scott Poole and I will again attempt to generate a new crop of hams. Please help us get the word out on this class. Details are available on the W4AP web site.

I'm happy to report that the Montgomery Amateur Radio Club is back on the Alabama corporate rolls as a non-profit organization. Thanks to WN9J and his law students for playing a critical role in this process. We're also rapidly nearing completion on establishment of MARC, Inc as a 501(c)3 non-profit

entity with the federal government. I expect to have final word on that project later in the spring.

Speaking of spring, here in Alabama that term is synonymous with severe weather. We've already had six SkyWarn nets as I write this and I expect things to really heat up shortly. If you wish to participate in the SkyWarn program, please attend one of the National Weather Service's outstanding spotter training classes. The schedule is available on their web site at <http://www.srh.noaa.gov/bmx/skywarn/index.php>. I ask that you have this training every few years to keep your skills sharp.

And finally, we're going to try something a little different this year for some of our meetings. Based on the success of our inaugural Central Alabama ARES meeting last year, I'm going to try holding quarterly ARES meetings this year. Our first meeting was on the "feature" of the Feb MARC meeting on the 18<sup>th</sup> and it was a rousing success attended by 39 folks including the District EC, 5 ECs, and 34 others. Bring questions, comments, and suggestions - by open dialog, we can continue improving our support to the local community.

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**MARC is turning 70!**  
**Come celebrate with us!**

The Montgomery Amateur Radio Club, which was established in 1938, is turning 70 this year! To commemorate the occasion, the club is planning a special activity. Several suggestions were discussed at the February meeting including operating a special event station in conjunction with the spring picnic. Discussions will continue during the March meeting. So, if you have a suggestion, or would like more details about the MARC birthday celebration, don't miss the March MARC meeting to be held Monday, March 17<sup>th</sup>, 2008 at 7:00PM.

PS: Bring your check and pay your dues while you're there! (See the membership application at the end of this newsletter)



## SkyWarn Provides Critical Support During 17 Feb Storms

On 17 February the Central Alabama SkyWarn Net was activated for over 7 hours handling critical, time sensitive storm reports and damage assessment for the National Weather Service. During this period, 46 trained spotters provided 16 on-scene storm reports (including 2 tornados) and myriad damage reports. While the line of storms affected our entire served area, the most severe damage occurred in Prattville where numerous homes and buildings were destroyed, trees uprooted, power lines downed, and a major gas leak erupted. I wish to again extend my personal thanks to our trained spotters for their continued support. Kudos!



*Photos courtesy Alabama Wing - Civil Air Patrol  
Provided by: Mal, KG4G - used with permission*

# Alabama Emergency Management Agency Update - February 2008

By -Fred Springall, KR4YK

Everyone knows that one of the major problems during 911 were the communications difficulties between the different first responders. Many of the first responders are hams and these are some of the projects that we are working on:

## Completed and ongoing communications projects-

- The most obvious was the purchase of 8 communications vehicles that have the capability of patching dis-similar radio systems together. These individual systems can be VHF Low Band, VHF High Band, UHF, 800 MHz trunking systems, Southern LINC and Nextel. These trucks have satellite capability (for internet and e-mail) and live video can be streamed from the site to the State EMA offices. There are also onboard VHF and UHF repeaters. The state is divided up into 7 Regions and one of the trucks is stationed in each region and one at the Alabama EMA office in Clanton. Each truck has different and specific radio capabilities that match the systems in their regions.
- AEMA has also licensed national first responder frequencies for use in Alabama. There is a Frequency Use Agreement with each county, the Poarch Creek Indian Tribe, other state agencies and surrounding states. The VHF frequencies are simplex and consist of a calling channel and four tactical channels. The UHF frequencies are duplex (intended to be used with the existing on-board repeaters) and also simplex UHF repeater output frequencies.
- The AEMA UHF repeater system has been expanded from 12 to 16 repeaters statewide and provides approximately 85% coverage statewide. These replacement repeaters can operate in digital mode, when that time comes.
- Radio gateways have been installed in practically all EMA offices to meet their day to day communications patching requirements.
- Additional equipment is available to the counties including transportable satellite systems, additional LINC equipment and Laptop computer with air-cards. This equipment can be requested by the county EMA offices for use during disasters.
- County response plans are being revised statewide.

## Future communications projects-

- A pre-programmed VHF and UHF radio cache that can be handed out to the first responders as needed at the disaster scene. This would be for temporary use, with the ultimate plan being that all first responders have these frequencies pre-programmed into their radios.
- Installation of a network to connect the radio gateways located in the counties to allow remote

access for patching and monitoring. This method would provide wide area communications when needed.

- Tower mounted trailers, with repeater capabilities, for immediate replacement of damaged towers or additional repeater service at the scene.
- Additional AEMA UHF repeater sites to provide better statewide coverage.
- Installation of equipment (compatible with the Mississippi and Florida systems) to provide continuous communications along the I-10 evacuation route from Jacksonville, FL through New Orleans.

## Amateur Radio Operations

- Amateur radio has always provided on the spot reporting for weather events and volunteer communication at areas such as reception areas and is to be commended for these efforts. It is always interesting who "comes out of the woodwork" when a tornado hits. The motto "When all else fails" is a true statement. Cellular telephones, internet service providers and BlackBerry units will not work unless the supporting system is operational.
- FEMA/DHS officially recognized amateur radio as part of the emergency communications community in late 2006. This could possibly lead to some available funding in the future.
- One of the problems is that most of the counties have a small staff and need augmentation during disasters. Many of the first responders are amateur radio operators, but not available because they have been called out.
- There is an amateur station at the State EMA office in Clanton that is open to licensed amateurs. Capabilities include HF, VHF, UHF 220MHz, and APRS. Please call me at 205-280-2288 or e-mail at [freds@ema.alabama.gov](mailto:freds@ema.alabama.gov) to make sure that it will be available when you want to visit.

## What can I do to help?

- Contact your county ARES coordinator, review the plan, check into the nets and let them know that you are available.
- Complete the basic Incident Command System on-line courses to become familiar with how the system works.
- Contact your county EMA office and ask what specific communications needs they have. Several of the counties have amateur equipment at their offices and just need operators or other support during disasters.
- Attend the training for the Regional Communications Vehicle and volunteer to be an operator.



The Montgomery Amateur Radio Club is sponsoring a  
**Getting Started in Amateur Radio class**

Every Thursday evening for 6 weeks  
Beginning on Thursday, March 20<sup>th</sup>  
6:00 PM until 8:00 PM.

Location: American Red Cross

Tuition: \$50.00

Includes textbook (a \$24.95 value)

And a Coupon for taking the FCC written  
examination (a \$14.00 value).

**For more information and to register for the class:  
contact Scott Poole**

**262-0412 between 5:00 PM and 9:00 PM**

or

e-mail: [W4SPA@ARRL.NET](mailto:W4SPA@ARRL.NET)

**Hurry! Registration deadline is  
Monday, March 10th**

### **Need a ride to MARC Meetings?**

*By Chris Hall, KD6BOD, Secretary*

If you or someone you know of would like to attend  
the monthly MARC meetings but cannot get there,  
we can help.

Please contact me at 334.309.4703 or by email at  
[secretary@w4ap.org](mailto:secretary@w4ap.org)

If you get my voice mail, please leave your name  
and phone number and we will make arrangements  
to get you to the meetings.

Please give us as much notice as you can. We have  
members that travel from areas other than  
Montgomery and would like to see you at the  
meetings.

Do you have old issues of Amateur Radio magazines  
lying around, cluttering up your home? Want to put  
those back issues to a good cause? Bob Overstreet,  
KI4MBZ, is heading an effort to put old copies of  
amateur radio related literature in public places,  
like doctor's offices waiting rooms, etc. with an  
invitation to come to a meeting or take a class with  
us. If you'd like to assist in this effort, please bring  
your unwanted magazines to any meeting and drop  
them off or, we can use your help distributing them  
to local businesses. See Bob for more information.

*Editor's note: My apologies for this edition of the ZeroBeat  
being a bit behind schedule. It take lots of effort by lots of  
folks to get one of these issued written and published. My  
sincere thanks to each of you that contributed articles to  
this issue. I couldn't have done it without you.*

Scott Poole, W4SPA  
MARC ZeroBeat Editor

### **Happy 100<sup>th</sup> Pete, W4AUP!**

*By Burt Pratt, K4PRF*

Pete Sides, W4AUP, will turn 100 years old this year  
on April 10<sup>th</sup>. Pete is the oldest MARC member and  
has made numerous contributions to the  
Montgomery Amateur Radio Club and to amateur  
radio in general over the years. Pete is one of the  
original radio pioneers. He was one of the very first  
hams I remember meeting and I feel sure he had an  
influence on my becoming an Amateur fifty years  
ago this year. For that I am eternally grateful.  
Pete is a life member of ARRL, a long time member  
of The Alabama Historical Radio Society, and a long  
time member of QCWA and the Peach state Chapter  
#49. He keeps regular schedules with many old  
friends and keeps up with numerous nets, epically  
the "Redi Kilowatt Net." I could go on but you get  
the idea.

### **MARC Golf Shirts**

*By Chris Hall, KD6BOD, Secretary*

It has been a while since the club has ordered new  
golf-style shirts. This year we are ordering Port  
Authority™ brand shirts. AKD, the company that  
produces our Field Day T-shirts will be making the  
shirts. The shirts are the club's colors, which is navy  
blue shirt with gold lettering. The MARC logo will be  
on the left side and your callsign will be on the  
right. Please note, if you are ordering for a female,  
specify ladies cut. Otherwise the shirt will be a  
men's.

#### Available sizes and prices are:

Small, Medium, Large and XL will be \$28.50

2X will be \$29.60

3X will be \$30.70

4X will be \$31.80

5X will be \$32.90

I will send an email out to the MARC list when  
[w4ap.org](http://w4ap.org) is set up for PayPal for this particular  
shirt. After the email, I will be taking orders for the  
golf shirts. These shirts are being offered at cost,  
plus tax, plus the embroidery for club logo & call  
sign.

#### **Something to think about**

Remember - As an amateur radio operator, the  
impression you make to the community reflects on  
us all. Think about it, you drive around town with a  
funny looking antenna sticking up in the air from the  
roof of your car and an amateur radio tag on the  
back. Your home looks like some sort of radio  
station to your neighbors. Please, try to make a  
positive impression. Remember, appearances really  
DO MATTER! Please conduct yourself accordingly.

## WHY WE FOLLOW RECOMMENDED STANDARDS AND PROCEDURES

By Tim Moore/K4TK

*In this two-part article, Tim discusses the importance of following established standards and procedures.*

In an earlier article I wrote about abbreviations in the Ham Radio and Telecommunications environment. Among the many acronyms and abbreviations I briefly mentioned was Recommended Standards (RS). An example would be the serial cable you plug into your computer which might be referenced to as RS-232. I told you briefly in that article that something such as the term RS-232 was a recommended standard, complete with specifications for that standard (examples of specifications might be length of cable allowed, top bandwidth or speed an item is rated for, maximum voltage allowed, etc.). But more importantly, in that article I mentioned that following these recommended standards or procedures is of the upmost importance (in both the Telecommunications industry and even in the world of Ham Radio). I also told you someday I would tell you why following those recommended standards was so important. And now the time has come to share some examples of what can go wrong if standards are ignored.

First let me say that many people do NOT follow recommended standards and procedures. Some simply don't know of the design specifications or limitations which are designated for the device or solution they are using. Others, while aware of the standards, may feel they can violate them or ignore them and in fact may have indeed done so in the past and actually designed and implemented a system, network, or circuit that worked (though sometimes they may actually be working with other than ideal results!). But although you MAY be able to design a system that works while violating or exceeding recommended standards, and doing so may often lead to a cost savings (by cutting corners), I'd like to point out why to do so is asking for possible disaster.

Typically most networks, circuits and designs will usually evolve, grow, and/or change through the life of their useful service. What typically happens (as you will see below) is that designs and implementations that might work AT FIRST while violating recommended standards, quite often fail later as devices are added or changed, power is increased, bandwidth or rates are increased, etc. And it's when these failures occur that troubleshooting the system at hand can be a nightmare. Often failures that occur show strange or bizarre symptoms (or intermittent symptoms) and can be puzzling to pinpoint the cause. There is no "easy button" for solving many cases of failures when standards are exceeded or ignored. And worse yet is the case where someone else designed the system perhaps long ago, violating recommended standards, and now later YOU are the unsuspecting "benefactor" of the results as

you attempt to change or improve on the system design, only to find it suddenly and with no apparent good reason fails!

I will now present to you what I will call six case studies involving actual real world examples of designs/systems that worked (albeit perhaps not perfectly?) initially, even though they violated recommended standards. All six of them worked initially and all six of them later FAILED. And I was the unfortunate recipient of the joys of figuring out why these systems failed and what it would take to make them function properly again. These real cases are typical of the things I have witnessed over my 30+ years of working in the Telecommunication world, as well as one case from my Ham Radio experience!

Case 1: The use of the all 0's subnet in IP network addresses in designing network architectures. Recommended Standard violated was a Request For Comments (RFC) in the network environment that suggests you should NOT use a subnet with all zeros (nor should you use a subnet with all ones). I'm not going to explain IP addressing and subnetting in this article, as that's a subject for another entire article! But suffice to say in the network world there is a long standing RFC that recommends you never use certain subnets of network addresses, as some devices cannot handle this situation as the ORIGINAL design specification identified in the RFC (which is the Recommended Standard in this case) said not to do this. Some vendors after the RFC was written actually designed their devices to be able to provide the capability to violate or exceed this "standard", but it is still strongly suggested you don't ignore this RFC (standard).

I was working in a test lab on a military base. Our job was to test out any equipment, designs, or changes of configuration that might be planned or desired for the Wide Area Network (WAN) that the Air Force wanted to utilize for future architectures. We were constantly adding, removing and changing equipment in the lab as part of the testing environment. Way back in the early days of the design of the lab, another Engineer that I worked with came up with the IP addressing scheme for the lab. In that scheme, to conserve on address space, the Engineer implemented an IP plan that included the use of subnet zero on networks in the lab. Because the devices that comprised our network backbone (in this case routers and switches) were designed to work with this violation of the RFC (though it was a command you had to initialize by configuring it on the router, no doubt because the vendor knew this was actually a condition that would be an "exception" to the recommended RFC), the lab network worked flawlessly.

But then one day we were tasked to test out a new encryption device. We typically would test devices like this for function, performance, compatibility and then finally, if the device was deemed worthy of use on our networks, we would make recommended configuration and implementation suggestions. IMMEDIATELY upon inserting these new devices into our lab network, any links with these devices in place FAILED! At first we reasoned

it was probably configuration errors on the new encryption devices. This was a reasonable assumption as we were unfamiliar with the new devices and they did have considerable configuration required (and likewise, some configuration was also required on the routers in the link). We spent many days troubleshooting the problem. Finally after days of changing configurations back and forth, trying one thing after another, I happened to notice the links in question were all using subnet zero on their networks. I knew the RFC said this was NOT a recommended standard/policy. I suggested we change the subnet on one of the links to something other than subnet zero, just to see if in fact this would fix the problem. The other Engineer working with me looked at me like I was crazy. He'd been using subnet zero on multiple devices and networks for some time with no problems ever occurring. I asked him to let me make the change anyway and much to his surprise it did in fact fix our problem.

This case demonstrates the classic problem of dealing with recommended standards (to include RFCs) violations. Initially the network worked. Adding a NEW device broke the network. It broke it because the existing devices in the system were made to work with RFC violations, while the NEW device was not designed to violate the RFC. The other typical thing seen in this case was that extra time was spent troubleshooting because the new device we added presented another list of things to examine when the link suddenly quit working, and in fact was the logical thing to look at since the links were working fine before the addition of the new device. As I said in the beginning, troubleshooting RS and RFC violations can be very puzzling. In addition to all the time wasted troubleshooting due to this standards violation, we had the added "joy" of having to re-IP (change all the addresses) our entire lab to get rid of all those subnet zero situations. If only the other Engineer had just followed the recommended RFC!

Case 2: The use of the all 0's subnet in IP network addresses in designing network architectures. Recommended Standard violated was an RFC. Sound familiar? But THIS time I'm working at a Telecomm company several years after the episode I explained above. My Telecomm company wants to upgrade our network. Our network attaches our "satellite" office back to our Corporate Headquarters, as well as providing us general Internet connectivity. The network has been working fine for some time. As part of our upgrade we plan on adding a firewall capability and a device that provides some additional Quality of Service (sound familiar: a working network growing/changing....adding devices? I think I see a pattern here!). After considerable coordination and debate with the ISP, they provide us with the required configuration information we need to implement our upgrades (many ISPs provide firewall and QoS capabilities, so they were somewhat reluctant to share information with us at first). When they gave me the IP addressing information I needed to configure our equipment, I thought surely there was a typo or mistake. It was using SUBNET ALL ZEROS! I thought surely an ISP

wouldn't do that. Surely they would know better than to take that chance on a major large network serving thousands of customers? They assured me not only did they use subnet zero at many of their customer locations, but that also they had never had any problems doing so. I expressed my reservations to our regional manager of our office, but he told me to push ahead with our upgrade.

And just as I expected the upgrade didn't work. I had to spend quite a bit of time on the phone with an Engineer from the ISP debating the RFC and the use of subnet zero. I agreed that while many routers can handle that (including the ones they were using), there are lots of devices that cannot handle subnet zero (even to this day!). Finally I had to get hold of one of the Engineers from the company that made our QoS device, and after considerable debate, that Engineer and I convinced the ISP Engineer to try our suggestion and change our IP address to something other than subnet zero. Using a different network address our new devices came on line and worked flawlessly. At first the ISP Engineer was confused and reluctant to admit that subnet zero could have been the problem. But then he finally admitted that only recently had the ISP changed a large number of customer site IP addresses, and that to get more efficient use of their IP scheme they had divided network address space in half (where customer numbers made it feasible) and by so doing, they had in fact caused many of their customer sites to now have subnet zero network addresses. While not all customers had complained of problems, some had indeed complained immediately after the change. He finally thanked us, and assumed he would no doubt find those users who were complaining probably also had devices on their networks that couldn't handle this violation of a recommended RFC (and he would have to change their addresses to something other than subnet zero).

Again a violation that at first worked, then the network "evolved" and with the addition of new devices, the violation of an RFC caused immediate failure. And again it could have been a bit difficult to pinpoint the problem as the new devices also had extensive configuration that could cause failure if not properly configured. And add in the additional problem of dealing with a "third party", who insists it can't be the violation of the RFC as they've been doing this for some time, and doing it at other places, with (supposedly) no problems! This third party kept insisting the problem was most likely our mis-configuration of the new devices.

*This article will continue in the next issue of ZeroBeat with more Case studies and a conclusion.*

# 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 (\$25 per year)

\_\_\_\_\_ Family Membership (\$40 per year)

\_\_\_\_\_ Senior Membership - age 65-69 (\$15 per year)

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

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