

Feed Line

GARA - We're putting the "Spark" back in Amateur Radio®



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SCIENCE CENTER HAM STATION NEEDS OPERATORS

By Allen Bradley, KD4IUN

We have a great opportunity right now to promote amateur radio in Greensboro. It is an opportunity that we are about to lose if we don't act now. Yeah, I know we have all heard that sales pitch before, but in this case I am talking about playing with radios and talking to people about radios; something we all love to do. This is an invitation to all licensed hams to come out to the Natural Science Center of Greensboro and operate station KF4RBN anytime the Center is open. Admission is free.

KF4RBN was built by Ryan Bradley, KD4TMD, as his Eagle Scout project in 1997. With help from a few scouts, hams, and parents, Ryan enclosed what had been a wide spot in the corridor leading to the Planetarium to make a ham shack. After getting approval from the management of the Science Center and his Boy Scout leaders, he solicited donations of over \$8600 in needed money and equipment. He worked very closely with Karl McKinnon, KD4UIT, Deputy Director of the Science Center in the planning and execution of the project. Today we have two HF radios: an Icom and a Kenwood. We also have a two meter radio and a very old PC.

Roger Joyner, W4AYO, Curator



Ryan Bradley, KD4TMD, at the controls in 1997 at the Natural Science Center. (Photo by Allen Bradley, KD4IUN)

of the Zane Planetarium, was also instrumental in building the station and is the driving force behind its continued existence. It occupies very valuable museum real estate. Every time a new exhibit is proposed, that location becomes a prime candidate for renovation. Roger told me that the station has not been used in over a year. He cannot justify an exhibit that is not used. The station still gets a lot of traffic. People stop and listen to a prerecorded message that Roger made, but they want to see it in operation.

All we have to do to keep the station is use it. That's all. Just use it. Roger would like to see it used every weekend. I know weekends are not ideal for us but that is when the museum is the busiest. It makes sense for us to be there when the people are there. Roger agrees that two weekends a month, either Saturday or Sunday, would be

wonderful and would just about guarantee that the station will remain for the foreseeable future.

He does request that we make an effort to be there during special events. These events draw very large crowds and will maximize our exposure.

April 8, 2006 - Bunny Day

May 6, 2006 - AniMania

May 27, 2006 Special Traveling Exhibit Opens:

Monster Trucks: The Science of Extreme Machines

June 10, 2006 - Dino Day

July 22, 2006 - Insectaphobia

July 28, 2006 - Thesaurus Shoppe

Christmas In July Sale

August 19, 2006 - Rock Fest

September 16-17, 2006 - Snaketacular

October 26, 2006 - Boo Bash

November 30, 2006 -Thesaurus Shoppe Holiday Sale

Next Meeting

The next meeting of the Greensboro Amateur Radio Association will be March 27, 2006 at the Golden Corral Steak House off Wendover Ave.

A program will be presented by Don Campbell, KG4IYH, on "Satellite Phones."

GARA Meeting Minutes



Regular Meeting Minutes February 27, 2006

The regular meeting of the Greensboro Amateur Radio Association was held at the Golden Corral Restaurant Monday evening February 27 at 7:15 PM at the Golden Corral Steak House off Wendover Ave.

The meeting was called to order by President John Doggett, KI4BMS. The minutes of the previous meeting were approved as printed in the "Feed Line."

There was no old business reported. Committee reports were presented.

Treasurer Ernie Wall, NC4EW, reported all was fine and new memberships were coming in steadily.

Al Allred, K4ZKQ, gave a financial report and said all was fine.

Secretary/web master/news letter editor Tom Forrest, N4GVK, reported that a sympathy card had been sent to Ann Gibson, N4AIG, for the loss of her mother. The web site had been renewed for another year. He also presented the new slogan for the web site "GARA- We're putting the "spark" back in Amateur Radio." Applications were still being sent out with the newsletter for renewals.

Engineering Committee report was presented by Arch, KT4AT. He said his soccer antenna software project was almost complete and he needed to finish the "LogPer" user manual. He said he found two more ways to balun and match the antenna, and he's retrofitting them into the software. New revision of the software has been uploaded to the repeater controller (145.150) along with announcements by WG4R. Other housekeeping issues were reported: surge protector boxes have been fixed and the UPS power supply had been

repaired with a new battery. Arch said the UHF repeater was due for a 6 month retune and he will proceed with a cold point calibration of both VHF and UHF.

Operations Chairman and Repeater Trustee Roy Smith, N4BYU, had no report. John Doggett, KI4BMS, reported about various events upcoming, including a fox hunt April 1, projects for construction, and training for new Hams and upgrades. In new business, Madeline Bradley, KD4SVJ, brought to the club's attention the need for Hams to use the station at the Natural Science Center. She stated they had received an e-mail from Roger Joyner, W4AYO, saying that it had not been used recently. Roger said in his e-mail if there was no interest, the Science Center could use the space for another exhibit. A sign-up sheet was passed around to permit members to schedule operating time at the station. Members also discussed possible ways to increase interest throughout the Ham community. Ryan Bradley, KD4TMD, built the station some years ago as an Eagle Scout project, and it would be a shame to let it be dismantled. Members showed a great interest in keeping it alive and a volunteer schedule was will be established.

The program for the evening was presented by Steve Marks, KE4FCW, Assistant Coordinator of Guilford County Emergency Management. He spoke on the amateur radio operator's role during an emergency. Steve stressed the need for coordination of communication during emergencies, and the need for amateurs to be familiar with the Incident Command System. Steve spoke about how to respond and what procedures you should go through during an emergency. He suggested "jump kits" and being prepared to respond at a moment's notice. The members thanked Steve for a very informative program.



Steve Marks, KE4FCW, Assistant Coordinator of Guilford County Emergency Management talks to the club.

BOARD MEETING MINUTES March 13, 2006

The regular monthly board meeting of the Greensboro Amateur Radio Association was Monday evening, March 13, at 7:30 PM.

Those present were John Doggett, KI4BMS, president; Rudy Langley, KG4HCT, vice president; Tom Forrest, N4GVK, secretary; Ernie Wall, NC4EW, treasurer; Al Allred, K4ZKQ, financial; Arch, KT4AT, engineering chairman; Roy Smith, N4BYU, repeater trustee/operations chairman; Clark Doggett, KG4HOM, and Mark Robertson, KG4STP members-at-large

Officer reports:

President John Doggett, KI4BMS, welcomed the members to the meeting. He mentioned the death of Wendy Coleman, KF4QDR, wife of John Coleman, KF4QDS, Saturday, March 12.

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Is The Machine “On-Frequency” ? (Part 2)

By Arch, KT4AT
Engineering Chairman

Last time, in Part 1, we saw that we had now the capability to adjust both VHF and UHF machines with a frequency error of only a fraction of a Hz, thanks to CDMA base stations and EndRun Technologies. The question now is, are those machines going to stay there ?

The answer is a resounding “Heck No !...”. The Mastr2 is equipped with two master oscillators, one to generate the LO (Local Oscillator) in the receiver, the other for transmit in the exciter. They are called ICOM’s (for Integrated Circuit Oscillator Module - nothing to do with the brand of same name). Depicted on Figure 1, they are little plug-in modules containing a TCXO (Temperature Compensated Xtal Oscillator). They operate between 12 and 18 MHz, because at those frequencies, the crystal disk is not too thin, and can be

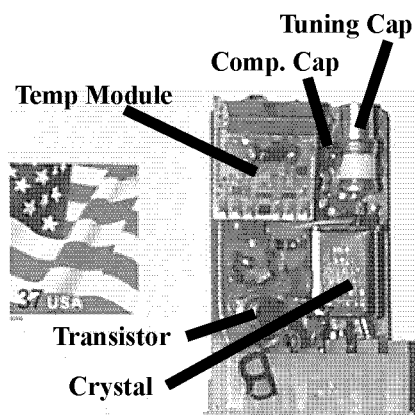


Figure 1 - Mastr2 ICOM

cut very precisely (“AT” cut). Figure 2 shows the Mastr2 frequency generation strategy, for both VHF and UHF machines, receive and transmit, with the values applicable to the 145.15 and 442.875 MHz repeaters. The receive sides are similar, with the TCXO followed by multiplying stages. On transmit, the TCXO is followed on UHF by a

Crystal aging creates frequency drifts because of two different phenomena: (1) contamination, and (b) assembly stress. Contamination occurs during the manufacturing of the crystal, when particles of various substances may enter the crystal enclosure. Those particles may include soldering or welding residues. Those particles redeposit on

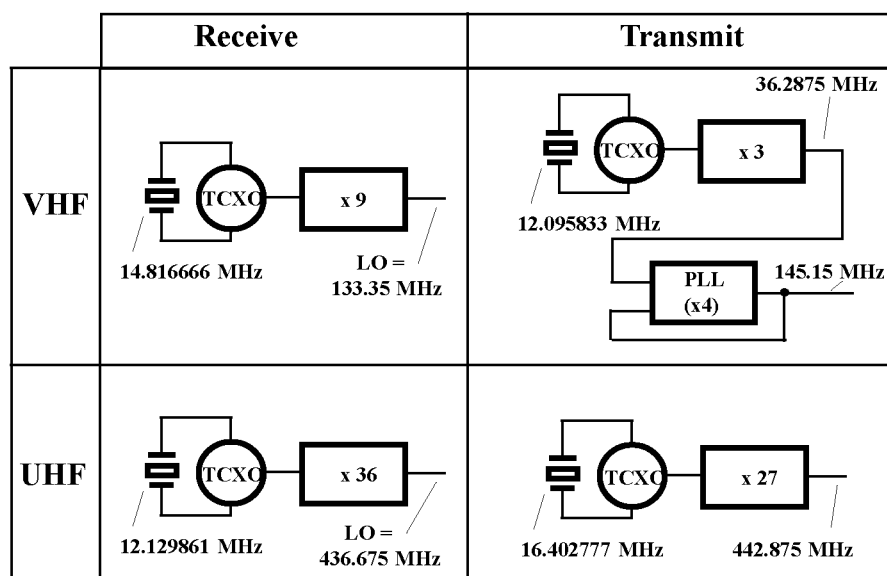


Figure 2 - Mastr2 Frequency Generation

multiplying-type exciter, but for sideband noise reasons, on VHF a PLL (Phase-Locked-Loop) is used.

There are three sources of drift for the TCXO: (a) crystal aging, (b) temperature, and (c) power supply variations. The last one is orders of magnitude lower than the other two if the supply voltage applied to the TCXO is well regulated. This is the case in the Mastr2, so we will not worry about this one any longer.

the crystal overtime, and reduce its frequency of resonance through mass loading. It is the manufacturer duty to ensure the cleanliness of his assembly process to minimize contamination. The second problem, stress, creates an increase in frequency when, overtime, that stress is relieved. This can be accelerated by application of heat, by storing the brand new crystal in an oven for sometime. The manufacturer does some of that. I also submit every new complete ICOM to

(Over----->)

a one week bake at 75 degrees Celsius (stress also happens when soldering the crystal to the ICOM board). Figure 3 shows the typical aggregate effects of both contamination and stress. The crystal will typically drift around 1 ppm during each of the first two years (creating an error around +/- 300 Hz at VHF, and up to 900 Hz at UHF). Then, the drift slows down, to reach a cumulative value of 2.5 to 3 ppm after ten years. What can be done to minimize those effects? In addition to the bake mentioned above, the other action is to retune frequently, particularly during the first two years. It is a good policy, for a machine with a new crystal, to retune after one month, three months, six months, a year, a year and a half, and after that once a year. Both GARA UHF machines have new ICM crystals (International Crystal Manufacturing) on receive and transmit. Both VHF machines are equipped with older crystals, of unknown origin, on receive, and one on transmit. The last VHF transmit has a 4 year old ICM crystal on transmit.

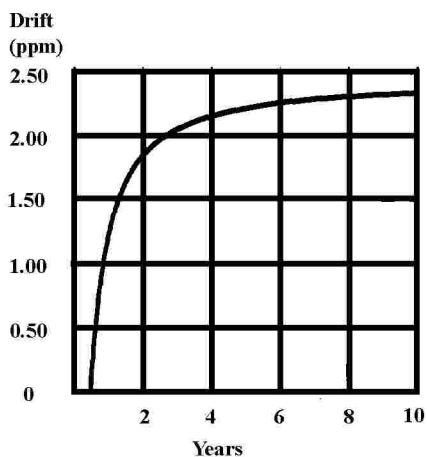


Figure 3 - Cumulative Aging

The last source of drift is the most difficult to deal with: temperature. As shown on Figure 4, AT-cut crystals exhibit an inverted S-shape drift curve as a function of temperature. Drift is zero at 25 degrees C, and frequency increases below, and decreases above. The magnitude of the drift is directly linked to the precision of the AT-cut angle. On

degrees C. In the Mastr2 ICOM, this will generally decrease to less than +/- 1 ppm, without adjusting the compensation capacitor. The GARA machines are subjected to approximately +10 to +40 degrees C, so we should see a drift on them of +/- 0.6 to 0.8 ppm. This translates to roughly +/- 100 Hz for VHF, and +/- 300 Hz for UHF. Fre-

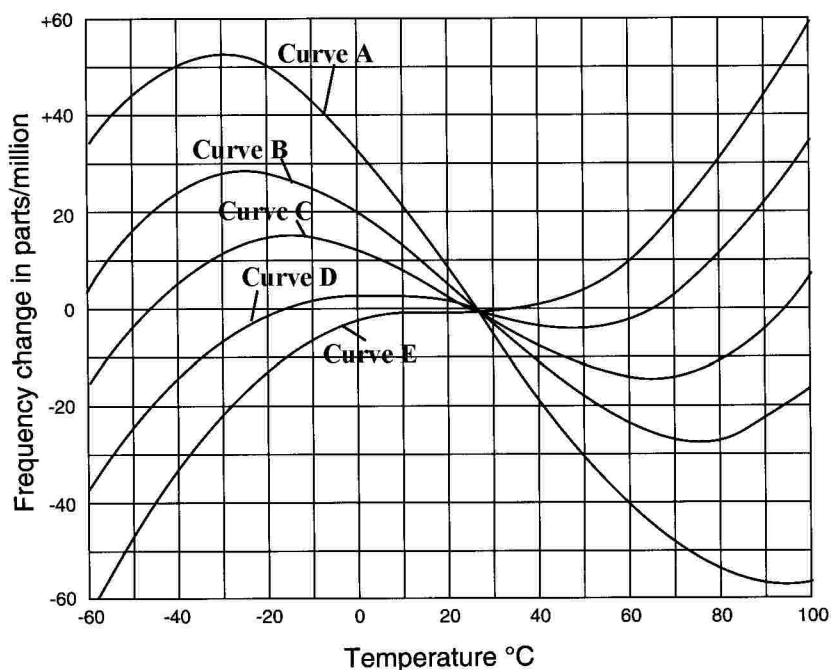


Figure 4 - Xtal Temperature Drift

Figure 4, Curves A and B would be typical of cheap crystals for computer use. Curve C would be typical of a more precisely cut crystal (and more expensive), without compensation. Curve D would apply to a partially compensated crystal, and Curve E to an ideally compensated crystal. The compensation is generally done by a capacitor in the oscillator circuit, which shows a drift opposite to the crystal drift. Uncompensated ICM crystals will generally have a drift of +/- 1.5 to 2 ppm between 0 and +50

quency will increase in winter, and decrease in summer, and we should be able to maintain the limits above. The last thing to do for that is to center the tuning point around 25 degrees C. This involves calibrating each ICOM drift, and tuning them with a correction depending on the ambient temperature at tuning time. This has not been done yet, but will be for all eight ICOM's by next summer. And, maybe one day, I will redesign those ICOM's to use an OCXO (Oven Controlled Xtal Oscillator), and a synthesizer.

North Carolina Youngsters Help ISS Commander Boost His QSO Record



All 19 youngsters who took part in the ARISS contact at Hallyburton Elementary got to ask a question of ISS Expedition 12 Commander Bill McArthur, KC5ACR.

By the ARRL

DREXEL, NC - The Amateur Radio on the International Space Station (ARISS) arranged contacts in March with two schools. One school located in the home state of Expedition 12 Commander Bill McArthur, KC5ACR, North Carolina and the other in Ohio. He told youngsters in North Carolina that he's been really been enjoying his duty tour onboard the International Space Station.

On March 3, McArthur chatted with youngsters at Harry Hallyburton Elementary School in Drexel, North Carolina--his home state. Tony Hutchison, VK5ZAI, served as the Earth station for both ARISS school group contacts, and Verizon Conferencing provided a two-way teleconference link between Australia and the schools.

McArthur told the third graders in Deborah Childers' class that some of the ISS crew's scientific research could directly benefit to people.

"We're doing scientific research every day to help to understand the human body better, and that can lead to new discoveries in medicine," McArthur said. "But the real focus of our flight is to learn how people can live and work in space for a very long time, because we think someday, human beings will colonize other planets."

Responding to another question, McArthur told the youngsters that brushing one's teeth in space does present a dilemma regarding what to do with "all the foamy toothpaste" when you're done.

"We use exactly the same kind

of toothbrush that you use and exactly the same kind of toothpaste," McArthur explained. "We have two choices: We can either swallow it, which is what I usually do, or if you don't like to do that, then you just hold a towel up to your mouth and spit it directly into a towel."

McArthur said he could see his home state of North Carolina from the ISS, but he could not identify his home town of Red Springs because it's too small to see.

As of this week, McArthur had racked up a record 30 ARISS school contacts during his mission, which wraps up in April. ARISS is an international educational outreach with US participation by ARRL, AMSAT and NASA.

Editor's Note: Drexel, NC is located in Burke County in western NC, between Hickory and Morganton off I40.

Ham Happenings NEWS briefs

Wendy Coleman KF4QDR, wife of John Coleman KF4QDS, passed away early Saturday morning March 11, in High Point.

She was a member of the Tri-County A.R.C and a member of Guilford County ARES.

GARA extends our sympathy and prayers to John and his family.

Vanity Calls - Get Ready For Renewals

With the renewal window about to open for the first Amateur Radio licenses assigned vanity call signs in 1996, the FCC's Wireless Telecommunications



Bureau (WTB) has attempted to clarify filing procedures. The WTB says vanity call sign holders whose licenses expire on or after June 4, 2006, must file electronically or on paper via the Universal Licensing System (ULS) <http://wireless.fcc.gov/uls/> to renew their licenses. Amateur Radio renewal applications may only be filed within 90 days of the license expiration date.

"Licensees of stations assigned vanity call signs have the option of keeping the vanity call sign or requesting that it be changed to a sequentially assigned call sign," the WTB points out. Those opting to keep their vanity call signs for the new 10-year license term must pay the current

regulatory fee, now \$21.90, when renewing (the vanity call sign regulatory fee may change in August or September). If the licensee no longer wants to keep a vanity call sign, no fee is required, and the applicant should request a sequentially assigned call sign instead.

Amateur Radio licensees holding vanity call signs granted prior to 1996 do not have to pay a regulatory fee when renewing. This is because Congress did not begin requiring the FCC to annually recover its regulatory costs until 1993. Additionally, such licensees are not specifically tagged as vanity call sign holders in the ULS.

To renew electronically via the ULS, licensees should log into ULS License Manager <<http://wireless.fcc.gov/uls/>> Online Filing (click on "Log In") using their FCC Registration Number (FRN) and Commission Registration System (CORES) password. Anyone doing business with the FCC must supply an FRN on any application.

To keep a vanity call sign, licensees

should select "Renew" under the "Work on this License" option. Fees for electronically filed applications may be paid online or mailed to Federal Communications Commission, Regulatory Fees, PO Box 358835, Pittsburgh, PA 15251-5835.

Online filers choosing not to renew a vanity call sign should select the "Systematic Call Sign Change" option from the "Work on this License" list. To obtain a new call sign, licensees should answer "No" to the question "Your license is eligible for renewal. Renew call sign (vanity call sign)?" Doing this will result in the issuance of a renewed license bearing a sequentially assigned call sign.

Licensees filing on paper must use FCC Form 605 (main form), and--if a fee is required--Form 159 (remittance advice). Licensees wishing to keep their vanity call signs should enter "Renew" under "Purpose" on Form 605 and enter the present call sign in item 5. Manual filers choosing not to renew their vanity call signs must file Form 605 (main form)

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Behind The Scene At The NCAA Tournament



SERIOUS SATELLITE WORK - Satellite uplink trucks fill the side parking lot of the Greensboro Coliseum Thursday during the NCAA tournament. CBS Sports also had their mobile studio equipped with HD-TV. (Photos by Tom Forrest, N4GVK)

Charlotte Hamfest & Computer Fair Big Event



CROWDS GATHER - Crowds line flea market tables at the Mecklenburg Amateur Radio Society's annual Hamfest & Computer Fair, March 11 and 12 in Charlotte. Attendance appeared to be good this year, but the absence of Icom from the manufacturers disappointed many attendees. (Photo by Tom Forrest, N4GVK)

Fox Hunt Slated For April 1

A "Fox Hunt" (a transmitter hunt for the newcomers) will be held on Saturday April 1st.

The hunt will start at the old Food Lion on 220 on the left after you cross Lake Brant.

The hunt will continue until 12 noon or until the fox is found at which time the group will head to Herbies on Battleground Avenue for lunch and a discussion of how the hunt progressed.

If you have any questions you can e-mail John Doggett at address: dogg7460@bellsouth.net

RADIO LOANER PROGRAM FOR GARA MEMBERS

A "Radio Loaner" program has been established as a service for GARA members.

Under the new loaner program, a member may borrow a two-meter handi-talkie for a 60 day period at no charge. These radios are 5 watts and pre-programmed on local repeaters and simplex frequencies. They have a Ni-Cad battery and rapid charger.

This will assist members who have a radio out for repair or a new Ham who has joined GARA and needs to purchase a radio.

If you have a need for a "loaner", e-mail us at info@w4gso.org. or contact a board member directly.

Board Meeting Minutes from page 2

Arch, KT4AT, gave his engineering report, discussing various items. General maintenance was to be performed and announcements were discussed.

Treasurer Ernie Wall, NC4EW, said renewals were coming in well.

Financial adviser, Al Allred, K4ZKQ, gave a financial report.

Member-at-large, Mark Robertson, KG4STP, had no report

Secretary Tom Forrest, N4GVK presented an idea to the board for a "radio loaner" program sponsored by GARA. This would be for members who need a radio on a temporary basis or a newly

licensed member without a radio. Two 5 watt handi-talkie radios (at present) are available along with chargers for the program. The radios are simple in operation and can be programmed with local repeaters. The program was approved by the board and will be announced on the web and in the Feed Line.

Vice-President Rudy Langley, KG4HCT, discussed activities.

Repeater trustee Roy Smith had no report.

There being no further business, a motion was made to adjourn the meeting at 8:15 pm.

Vanity Call Renewal from page 6

Schedule D in order to obtain a new systematic call sign. The "Purpose" on the main form must be "Renewal/Modification," and the "Systematic Call Sign Change" question on Schedule D must be answered "Yes."

If no FRN is provided on the main form, an FCC Form 160 (registration) is also

required for manual filing. All forms are available via the FCC Forms <http://www.fcc.gov/formpage.html>.

For more information on how to renew an Amateur Radio vanity call sign, visit the FCC Help & Support page <http://esupport.fcc.gov/index.htm> or call the ULS Customer Support Hotline, 877-480-3201 (TTY 717-338-2824)

Area Activities

FOURTH MONDAY – at 6:30 PM, the **Greensboro Amateur Radio Association** has their regular monthly meeting at the Golden Corral on Landview Dr., off W. Wendover Ave. Please plan to gather at 6:30 PM for dinner. The meeting is scheduled to start at 7:15 PM

CLUB NETS:

SUNDAYS – weekly at 9 PM, the **GARA News and Information Net**. This net features NewsLine and is on the 145.150, W4GSO repeater. Roy Smith, N4BYU is always looking for net controls. Contact him if you would like to help.

THURSDAYS – The **Guilford County ARES Net** meets on the 145.150 repeater (100 Hz. tone) at 9 PM.

TUESDAYS – at 8 PM, the **2 Meter SSB Net** meets on 144.225 Mhz. USB. Chris Thompson, K4HC is the net control station.

WEDNESDAYS – The **Guilford Amateur Society** holds their weekly net on the 145.250, W4GG repeater with an 88.5 Hz. tone. Jim Hightower, W4JLH is the net control.

TUESDAYS – at 8:30 PM The **Triad SkyWarn Net** meets on the 147.225, K4ITL repeater, no tone required.

OTHER ACTIVITIES :

FIRST MONDAY – The **Guilford County A.R.E.S.** monthly meeting is held at 1002 Meadowood St. off W. Wendover Ave, in the EMS building, beginning at 7 PM.

THIRD MONDAY – at 6 PM The **Guilford Amateur Society** holds their monthly meeting at the Golden Corral on Landview Dr., off W. Wendover Ave. Dinner at 6:30 PM and the business meeting is slated to begin and 7 PM.

SATURDAYS – at the K&W Cafeteria on Big Tree Way, hams get together for **Saturday Breakfast** at 7:30 AM. Talk-in is on the 145.150, W4GSO repeater, with 100 Hz. tone.

MONDAYS & FRIDAYS – at 11 AM, Greensboro Hams get together for lunch. On Monday they meet at various locations. Check on the 145.15 repeater for current location and on Friday lunch is at the K&W Cafeteria off South Holden Road. Talk-in is on the 145. 150, W4GSO repeater with a 100 Hz. tone.

EVERY FRIDAY – at 8 PM (approximately) Greensboro Hams get together for coffee at Starbucks at Guilford College (winter location till Daylight Savings time changes)

Greensboro Amateur Radio Association

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Web:
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Time To Renew GARA Memberships

If you haven't already renewed, this is your LAST issue of the Feed Line. Please renew your membership to GARA. If you have renewed your support for 2006, we really appreciate it. THANK YOU!

For more information, visit our web site: www.w4gso.org and click on the join button.

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The Official Publication of GARA