



The Greensboro Amateur Radio Association

Feed Line

Providing Amateur Radio news for the Triad



Brian Wilson, NX4U, Editor

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Local Technician Class is a Success

By Craig Bondy, N8STA

A technician class was held at Hinshaw United Methodist Church on October 29 from 0830 to 1700, followed by a testing session supervised by W4VEC team members. Gaither Frye, W4GCF, organized the class and I (Craig) assisted.

The students consisted of 24 participants from various walks of life, including at least two college professors and several high school teachers. I seem to recall four firefighters, as well, but I don't recall the rest of the vocations. I also recall two of the participants had been hams in the past and wanted to get back into the hobby. One participant had been recruited during the Amateur Radio Expo at the Natural Science Center by Gaither and myself. One of the participants graciously brought doughnuts for the class.

We want to thank Jim Waynick, N4JLW, and Hinshaw United Methodist Church who continue to be very strong supporters of Amateur Radio in general and GARA, as well.

Seventeen (17) of the participants sat for the exam after the class, and eight (8) of them passed and obtained their technician license. They are as follows:

Paul M Collins - Tech - KK4MHV

Daniel A Jones - Tech - KK4MHW

Thomas W Niedziela - Tech - KK4MHX

Gregory T Ray - Tech - KK4MHY

Sheila M Whitley - Tech - KK4MHZ

Storm B Williams - Tech - KK4MIA

Thomas R Woodson - Tech - KK4MIB

Shirley M Stipe-Zendle - Tech - KK4MIC

From my perspective Gaither did a stellar job of organizing the entire process that I witnessed (I was there for the first half of the day) and it all went very well.

Exam Time, Number 2

By David Macchiarolo, AJ4TF

At the October meeting, Donna, KD4WIK, gave us all some brain teasers from the FCC examination question pools. Many people seemed to like this, so we decided to pick some questions out of the pools each month and give the answers. The entire question pools are available for download from the ARRL web site and other places as well. The General and Extra pools have 10 major topic sections. Between the two pools, there are over a thousand questions so we will not get through all of them in a short time, but what I plan to do is each month pick 5 questions from the General pool, and 5 from the Extra pool,

NEXT MEETING

Monday, November 26

The next meeting of the Greensboro Amateur Radio Association will be Monday, November 26th, at Captain Bill's Seafood & Steakhouse, 6108 West Market Street, Greensboro, NC 27409, between Guilford College Road and Swing Road. This program for this month's meeting will be the election of officers for the coming year, a tribute and recognition of our Veterans and the presentation of some equipment to the club from a SK's family.

GARA Meeting Minutes

Regular Meeting Minutes October 22, 2012

The Greensboro Amateur Radio Association held its monthly meeting on October 22nd, 2012, at Captain Bill's Seafood & Steakhouse located at 6108 West Market Street in Greensboro. GARA president, Donna Ferguson, KD4WIK, called the meeting to order at 7:15pm.



Officer reports

Roy Smith N4BYU said that GARA has been given an Icom 746 pro with a power supply and an amplifier. The wife of the late Ronald Rippey, W4TQT, donated this radio gear. Roy proposed placing the radio on permanent loan at the Natural Science Center for use in the K4NSC station. The GARA board of directors has approved this proposal. Roy made a motion that we get a plaque made to present to the widow of W4TQT at the November meeting. Tom Bertolino seconded, the motion passed.

Donna said that David Macchiarolo, AJ4TF, could not make the meeting so she read the engineering report he sent to her: "The gateway is sick and needs the hard disk replaced which he will do as soon as he gets back in town."

Roy said that John Strandberg, W4DX, organized the Expo and the Open House and should be thanked for his hard work.

Donna reminded us that dues would be coming due soon.

Donna also stated that Gaither Fry, W4GCF, has 17 prospects so far for the technician class coming up on October 27th at Hinshaw Methodist Church.

Donna asked everyone to identify himself or herself.

GARA will hold a Christmas party on December 15th at 6pm at the Olympic Restaurant.

Thomas Fleming, KJ4YDP, gave a preliminary list of nominees of officers for 2013. The list of

The Greensboro Amateur Radio Association

President Donna Ferguson, KD4WIK
Vice-President Todd Smith, AK4TS
Treasurer Craig Bondy, N8STA
Secretary Greg Spencer, KG4UQV
Financial Vacant
Engineering Chair David Macchiarolo, AJ4TF
Operations Roy Smith, N4BYU
Member-at-Large Fred Lomax, KK4BAW
Member-at-Large Gaither Frye, W4GCF
Appointed Position:
Webmaster & Newsletter Editor
Brian Wilson, NX4U

The Feed Line is ©2012 by the Greensboro Amateur Radio Association and published monthly. Our address is P.O. Box 7054, Greensboro, NC 27417. The purpose of the newsletter is to provide the club and prospective members information about the club and amateur radio in general. Material and information should reach the editor by the first Friday of the month for the next edition of the newsletter. Opinions expressed in "The Feed Line" do not necessarily represent the views of the officers, directors, editor or members of the Greensboro Amateur Radio Association. Material may be reproduced, provided proper credit is given to GARA.

nominations is as follows: President: Donna Ferguson, KD4WIK; Vice President: Tom Bertolino, KB1P; Financial: Todd Smith, AK4TS; Secretary: Greg Spencer, KG4UQV; Treasurer: Craig Bondy, N8STA; Engineering: David Macchiarolo, AJ4TF; At Large: Gaither Fry, W4GCF; Chan White, KJ4ADX. Roy nominated Ed Henderson, W4CMK. Tom Bertolino made a motion to close nominations, Roy seconded. The motion carried.

Donna said that there will not be a program tonight but instead she had developed a shorter list of questions derived from the General and Extra class license pool of questions. Correctly-answered questions were rewarded with candy.

Bob Saunders, W2IKN, donated a bag of electronic parts.

Roy gave us a history lesson on GARA as well as the way amateur radio license testing was done before we had VEs. Weldon Fields, W4AJT, gave a brief history lesson on the beginnings of SERA. The meeting ended at 8:21pm.

Respectfully submitted by Greg Spencer, KG4UQV, GARA Secretary.

Board Meeting Minutes November 12, 2012

The GARA board of directors held their monthly meeting on November 12th, 2012, at the Katherine Clay Edwards Branch library. The members present were: Donna Ferguson, KD4WIK; Craig Bondy, N8STA; David Macchiarolo, AJ4TF; Roy Smith, N4BYU; Todd Smith, AK4TS; Fred Lomax, KK4BAW; and Greg Spencer, KG4UQV.

Donna presented the list of nominees for the 2013 board of directors:

President - Donna Ferguson, KD4WIK; Vice President - Tom Bertolino, KB1P; Finance - Todd Smith, AK4TS; Treasurer - Craig Bondy, N8STA; Secretary - Greg Spencer, KG4UQV; Engineering - David Macchiarolo, AJ4TF; At Large Members - Gaither Fry, W4GCF; and Chan White, KJ4ADX.

Officer reports

Donna and Fred spoke about the antenna repairs and replacements that were done over the weekend at the home of Thomas Grohal, KV4AK, who was injured in a bad fall recently.

Craig spoke about a change that he made to the treasury spreadsheet to make it easier to read. Craig also said that 2013 membership dues are starting to come in.

David said that he replaced the hard disk and fans in the D-Star gateway and it is running good. David said that he made a current back up of the system while he was there. David also said the VHF repeater is doing well. David said that he has the paperwork ready for the 2013 N4G event, and he will be sending it to the park service in the next few days. He also said that the call sign has been reserved. David also brought up the fact that Glenda Nicholson, AG4NC, wants to retire from W4VEC. David said that while this is not a GARA-specific issue, it would be a great loss to the area ham community. We should look into trying to find a replacement for Glenda.

Roy expressed the need to write a thank you letter for the Icom radio and equipment that has been donated to GARA. Roy also said that we need to send a letter to club members who do not come to meetings to let them know what the club has been doing.

Todd said that he would like to thank all veterans for their service. Todd made a motion that we recognize them at the next meeting, Greg seconded, and the motion passed.

We discussed the non profit 501C3 and Roy made a motion that Todd research the 501C3 requirements, Craig seconded and the motion passed.

Roy said that the owner of the tower that our repeater is on will be adding more equipment to the building.

Donna said she is researching updating the web site.

David gave an update about the ARISS contact stating that a NASA technical coordinator has contacted them concerning the event. David said that we are getting the paperwork ready and will forward it back to the school soon. David said that RF Micro will supply the equipment for the ARISS contact. David said that two Guilford county school staff members have been licensed recently.

Roy made a motion to adjourn. Todd seconded, and the motion passed.

The meeting ended at 8:55pm.

Respectfully submitted by Greg Spencer, KG4UQV, GARA Secretary.

Goodbye IRCs

From USPS provided by David Macchiarolo, AJ4TF

It's a done deal. USPS will no longer sell IRCs, apparently. From the US Postal Regulatory Commission:

"Commission analysis. The Commission approves the proposed mail classification changes for Special Services. The proposal to remove Outbound International Reply Coupons Service is not inconsistent with the statute. The small number of consumers, such as amateur radio operators, who purchase International Outbound Reply Coupons, will no longer be able to do so. However, they will still have options. For countries to which a Money Order may be sent, once the U.S. sender ascertains (or estimates) the cost of sending the QSL card from the foreign country to the U.S., the U.S. sender can obtain and send a money order in that amount. Senders and recipients may find it more convenient and less costly to use an online payment service to transmit the cost of mailing a QSL card."

You can read the whole report here: http://www.prc.gov/Docs/85/85662/Order_1541.pdf

The section on IRCs starts on page 80.



From the President's Shack

From Donna Ferguson, KD4WIK

As I sit here after our Thanksgiving family dinner and watch my children and grandchildren play and bicker, I am reminded of how much our radio group is like a big family. We don't always agree on everything and sometimes we bicker over silly stuff but when someone is in need, we do our best to go help them in whatever way we can.

I didn't send out a Thanksgiving e-mail so I hope everyone had a wonderful Thanksgiving and was able to spend time with family or close friends and enjoy the time together. These are the times to be cherished. In these busy times, it is often difficult for families to get together more often than holidays. Cherish and love one another always.

November is a busy month. There was Veteran's Day, Thanksgiving, and at our next meeting, we will have GARA elections. The nominations have been announced and they are as follows:

President: Donna Ferguson, KD4WIK
Vice President: Tom Bertonlini, KB1P
Secretary: Greg Spencer, KG4UQV
Treasury: Craig Bondy, N8STA
Finance: Todd Smith, AJ4TS
Engineering: David Macchiarolo, AJ4TF
Operations: Roy Smith, N4BYU
Member-At-Large: Gaither Frye, W4GCF
Member-At-Large: Chan White, KJ4ADX



Please come to the November meeting and show your support for those that have been nominated to serve on the board.

If you have not paid your dues yet for 2013, please consider continuing your membership with GARA. We have been very active in 2012 and I don't see 2013 slowing down. With your membership and support, we can continue being very active and involved with our members and community.

Until Next Time,
73s, Donna, KD4WIK

Other Info from around NC

From North Carolina Section News by Bill N2COP

NC QSO PARTY – The Raleigh Amateur Radio Society (RARS) is taking over administration of the NC QSO Party, which has a new website: <http://www.rars.org/ncqsoparty>. A tip of the hat to Henry Heidtmann, W2DZO, and the Forsyth Amateur Radio Club for its management of the NC QSO Party for many years, and to Marty Young, W4MY, who will head up the NC QSO Party for RARS. Set the date for the next NC QSO Party on your calendar now: February 24, 2013.

LONGTIME CDXA PRESIDENT TED GOLDTHORPE, W4VHF, STEPPING DOWN – For those who like to chase DX, we are fortunate to have an ARRL affiliated dedicated DX club located in North Carolina: the Carolinas DX Association. Although based in Charlotte, it serves members throughout North and South Carolina, and in many other states. Not many ARRL sections have a DX club so take advantage of its resources and superb website at www.cdxa.org. Ted, W4VHF, has been the long time chief of CDXA and after many years of unflagging service, he and his equally hard working YL Itice, K4LVV, are taking some well deserved time off. Thanks Ted and Itice for your expert leadership in making DX fun in the Carolinas.

Engineering Update for November, 2012

From David Macchiarolo, AJ4TF

VHF Repeater:

Not much to report this month, as usual the VHF FM repeater is running well. A few months ago I gave you some technical information on the VHF repeater, I'll repeat this information for your interest here in case some of you missed it.

The 145.15 VHF repeater consists of two modified GE MASTR-II station radios, one active, and one on cold standby (which means, it is powered off). If the primary radio fails, the backup radio can be switched into service, but it requires a trip to the site to accomplish this.

The GE MASTR-II series of radios was produced for decades by the Land Mobile Radio business of General Electric mainly for commercial users. Over the last several years the company has been sold several times. The names have included General Electric, Ericsson, Com-Net Critical Communications, M/A-Com, Tyco and now Harris. These radios are very rugged and straightforward to modify for amateur radio use. Believe it or not, the oscillators used in these radios are crystal controlled. Yes, I know crystals are 'old' technology, but since the repeater frequencies don't change, a very stable temperature compensated crystal can allow a great degree of stability to the repeater. The input preamp, power amp, audio and CTCSS processing are all augmented by modifications designed by Arch, KT4AT, and make these radios much more stable with cleaner audio than the standard MASTR-II radio.

The repeater also has a controller, which operates the radio. It is a Link Communications RLC2 controller + digital voice recorder (DVR). The controller/DVR is powered by an Astron RM-35 13.8V linear power supply which is powered by a 425 watt UPS. (The RM-35, although reliable, is overkill for the controller, which only uses a few watts). Additionally, there is a small 12V, 2 Ah lead-acid battery that holds up the 16 MB of memory on the DVR, which, unfortunately, is volatile. Cheap non-volatile memory did not exist 20 years ago when this product was designed. The RLC2 controller processor has a small lithium battery-backed memory (DS1225) to retain its programming information, and a smaller one (DS1220) to retain the autopatch dialing information. These are guaranteed to hold their contents for 10 years without power. <http://www.maxim-ic.com/datasheet/index.mvp/id/2646> These small static RAM modules are only called upon when the controller is not powered (similar to the battery-backed so-called "CMOS" storage on your PC).

The digital voice recorder (DVR) is used to store the voice messages that play at programmed intervals ("Welcome to the W4GSO repeater..."), as well as providing space for users to record messages that can be played over the air. The DVR contains 16MB of memory, but, like I said, at the time it was designed, cheap non volatile flash memory was not available, so they used dynamic RAM, in fact, it uses the old SIMM memory modules that were used in PCs in the 1990s. Yes, today, you can buy 1000 times that much flash memory for a few dollars, but that wasn't the case 20 years ago. The down side of dynamic RAM is that when you remove the power, poof, it's erased.

The repeater controller program is designed to continue to operate even if the voice messages don't play, it continues to ID in CW, which meets the FCC requirements.

So, when you key the repeater up after it has been sitting idle for a while, enjoy listening to either "Bill" or "Jane" welcoming you to the W4GSO repeater!

D-Star Repeater:

As I told you last month, as a result of the gateway hardware difficulties this past summer, I created a web page to monitor the gateway operation. It is updated every 10 minutes. You can see the gateway status by pointing your web browser to: <https://w4gso.dstargateway.org/gwstatus.html> Be sure to use https (not http).

I also told you last month that Arch, KT4AT, experienced several fan failures on the development machine that he keeps at his QTH. As this computer is identical to the ones we have, and is approximately the same age, the GARA board decided to go ahead and replace the fans in both the Linux gateway computer, and the repeater controller (the hardware on both is identical). Since both machines use solid-state disk drives, the fans are the only moving parts. Fans are usually the weakest part of any high-reliability electronic system; where ICs and solid state components can last literally decades under continuous use, you're lucky to get a few years out of a fan.

We made a trip to the repeater site to replace all of the fans on both computers (4 in each, for a total of 8). While we were there, I swapped out the troublesome solid state hard drive on the gateway computer with a new one. After reloading the software from a backup, everything seems to be stable now.

As always, if you have any questions or concerns about your club repeaters, either VHF or D-Star, or any other technical topic, please contact me at aj4tf@arrl.net

73, David AJ4TF

November, 2012

Page 5

Congratulations! You Passed!

Every month on the second Saturday, except in March when it is the third Saturday, W4VEC holds a testing session for those who live in the area. This provides an opportunity for individuals to be able to test for their amateur radio license or upgrade. Thanks to Glenda Nicholson, AG4NC, and a group of volunteers, each month there are new or upgraded hams in our area.

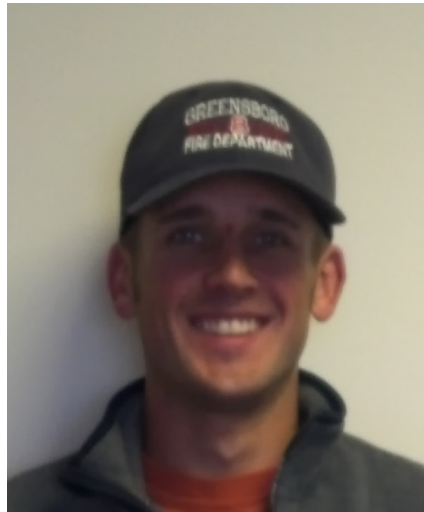
In November, we had three (3) individuals who passed their test(s) and earned either their Technician, General or Extra class license.

Next month's testing session will be on December 8th at #3 Centerview Dr, Hickory Building, Greensboro, NC 27407 at 9:00am. While walk-ins are welcome contacting the lead VE is preferred. Please contact Glenda Nicholson at (336) 674-3810 or by email at ag4nc@bellsouth.net

All Photos Courtesy of David Macchiarolo, AJ4TF



*Todd W Apple, KK4MNH
Passed Tech*



*Seth A Webster, KK4MNI
Passed Tech*



*Roy W Terwilliger, KK4LLZ
Upgraded to General*



During the testing session the Volunteer Examiners watch while the participants work to answer the questions correctly.

Annual Ham Radio Christmas Social

From Jim Hightower, W4JLH

Hello, and early Seasons Greetings to all! The annual "Ham Radio Christmas Social" will be on Tuesday December 11th, 2012. Gary Hastings, KE4IAN will again provide the musical entertainment.

There is no admission charged for this event. We ask that you bring some canned goods which will be donated to the Greensboro Urban Ministry. You will, of course, pay for your meal.

All amateur radio operators, their families and/or guests are invited. This notice is being sent to the G.A.S. and G.A.R.A. members on my email list and there may be some newer Hams who will not be notified. So, please mention this event to any ham who you think may not know about it.

Mark your calendar as follows:

Ham Radio Christmas Party: Tuesday, December 11th, at 7:00 p.m.

Bonnie Kay Seafood Restaurant

222 Spur Road , Greensboro , NC 27406

Directions to the restaurant: South on Randleman Rd. from I-40 to the flashing caution light; turn left on Spur Road and the restaurant is ¼ mile on right.

Please send an email to Jim at w4jlh@bellsouth.net before December 7th with a number in your party so the restaurant can plan accordingly.



Amateur Radio in Space

From ARRL

Shortly before 9 PM EST on Sunday, November 18 (0200 UTC Monday, November 19), a Soyuz spacecraft carrying Expedition 33 Commander Sunita Williams, KD5PLB, and Flight Engineers Yuri Malenchenko, RK3DUP, and Aki Hoshide, KE5DNI, landed in the steppes of Kazakhstan, returning them safely to Earth from the International Space Station (ISS) after 127 days in space.

While aboard the ISS, Williams, Malenchenko and Hashide completed 39 contacts with schools via the Amateur Radio on the International Space Station (ARISS) project. According to NASA ISS Ham Radio Project Engineer Kenneth Ransom, N5VHO, this ties with Expedition 15 for the fourth highest number of contacts. In 2011, Expedition 26 -- led by Scott Kelly -- set the record for having the most ARISS contacts at 73.

Of the 39 school contacts made by Expedition 33, 14 were via telebridge, while 25 took place directly between the school and the ISS via Amateur Radio. A telebridge contact uses an ARISS Amateur Radio ground station and establishes the radio link with the ISS; voice communications between the students and the astronauts are then patched over regular telephone lines. Williams completed 22 contacts with the US, Australia, Germany, Canada, Turkey, Malaysia, Luxembourg, Italy, Spain, Switzerland and India. "In India, we can't have a direct ISS-to-school contact," Ransom explained. "We have to use telebridge because you cannot become a licensed radio amateur in that country before the age of 18. That means the school children can't legally talk on the radio, so we use a telebridge station so they can participate in the contact."

Malenchenko made two contacts, one with the Ukraine and another with Russia, while Hashide completed 15, including four with his native Japan, as well as with the US, Germany, Australia, Poland and Italy.



NASA astronaut Sunita Williams, KD5PLB (back left), along with Russian cosmonaut Yuri Malenchenko, RK3DUP (front left) and Japan Aerospace Exploration Agency astronaut Akihiko Hoshide, KE5DNI (back, second from left), returned to Earth from the ISS on Sunday, November 18. NASA astronaut Kevin Ford, KF5GPP (back right), and Russian cosmonauts Evgeny Tarelkin (back, second from right) and Oleg Novitskiy (front right) are part of Expedition 33/34; they launched to the ISS in late October and are scheduled to return to Earth in March 2013.

Questions (continued from page 1)

from different topics sections. If you have not upgraded yet, perhaps you will find this column useful and maybe give you a jump-start into your own studying. Caution: Do not just memorize that the answer to question E0A11 is "C". The actual tests mix up the order of the answers that are presented, so you need to know which answer is actually the correct one. For each question, I will provide the actual question as it is worded in the pool, and the possible answers that are part of the pool. I will tell you the correct answer, and try to explain why. For each question, the relevant section of the Part 97 rules (if applicable) is given. So,

here we go:

GENERAL

G6A01

Which of the following is an important characteristic for capacitors used to filter the DC output of a switching power supply?

- A. Low equivalent series resistance
- B. High equivalent series resistance
- C. Low Temperature coefficient
- D. High Temperature coefficient

The answer is (A). Equivalent series resistance for a capacitor is caused by the resistance of the leads and electrode materials. A higher ESR, especially when used in a circuit that has a high ripple current (like a power supply) can lead to increased temperature of the capacitor and potentially shorten its life.

G7A01

What safety feature does a power-supply bleeder resistor provide?

- A. It acts as a fuse for excess voltage
- B. It discharges the filter capacitors
- C. It removes shock hazards from the induction coils
- D. It eliminates ground-loop current

*The answer is (B). Large filter capacitors can have significant stored energy in them even when the circuit is powered off. A high value resistor connected across the capacitor terminals converts that stored energy to heat and allows the capacitor voltage to drop down to zero when the circuit is powered off. The expression for calculating stored energy in a capacitor is $1/2 * C * V * V$. Energy varies as the square of the voltage, so 3 times the voltage is NINE times the energy! (energy is measured in joules.. one joule per second is a watt).*

G8A01

What is the name of the process that changes the envelope of an RF wave to carry information?

- A. Phase modulation
- B. Frequency modulation
- C. Spread spectrum modulation
- D. Amplitude modulation

The answer is (D). The 'envelope' is another term for the amplitude.

G9A01

Which of the following factors determine the characteristic impedance of a parallel conductor antenna feed line?

- A. The distance between the centers of the conductors and the radius of the conductors
- B. The distance between the centers of the conductors and the length of the line
- C. The radius of the conductors and the frequency of the signal
- D. The frequency of the signal and the length of the line

The answer is (A). The characteristic impedance of a given transmission line is independent of its length, and, for the most part, independent of the frequency. For two parallel wires, it depends on the logarithm of the ratio between the distance between them, and the radius of the wire conductor itself.

G0A01

What is one way that RF energy can affect human body tissue?

- A. It heats body tissue
- B. It causes radiation poisoning
- C. It causes the blood count to reach a dangerously low level
- D. It cools body tissue

The answer is (A). Think of what happens when you put a steak in the microwave oven.

EXTRA

E6A01

In what application is gallium arsenide used as a semiconductor material in preference to germanium or silicon?

- A. In high-current rectifier circuits
- B. In high-power audio circuits
- C. At microwave frequencies
- D. At very low frequency RF circuits

The answer is (C). GaAs outperforms germanium and silicon at high frequencies.

E7A01

Which of the following is a bistable circuit?

- A. An "AND" gate
- B. An "OR" gate
- C. A flip-flop
- D. A clock

The answer is (C). The definition of 'bistable' is a circuit that has two stable states that it can remain in. Out of the selections given, the flip flop is the best answer. The term bistable wasn't always used in relation to flip-flops, see a history of flip-flops on Wikipedia (http://en.wikipedia.org/wiki/Flip-flop_%28electronics%29).

E8A01

What type of wave is made up of a sine wave plus all of its odd harmonics?

- A. A square wave
- B. A sine wave
- C. A cosine wave
- D. A tangent wave

The answer is (A). A tutorial on Fourier series is probably beyond the scope of this column, so you'll have to trust me.

E9A01

Which of the following describes an isotropic antenna?

- A. A grounded antenna used to measure earth conductivity
- B. A horizontally polarized antenna used to compare Yagi antennas
- C. A theoretical antenna used as a reference for antenna gain
- D. A spacecraft antenna used to direct signals toward the earth

The answer is (C). An isotropic antenna radiates equally in all directions in a spherical pattern. When you see an antenna gain specification that gives it in dBi, it is referring to gain over (or under) a theoretical isotropic antenna, which cannot exist under normal conditions.

E0A01 (C)

What, if any, are the differences between the radiation produced by radioactive materials and the electromagnetic energy radiated by an antenna?

- A. There is no significant difference between the two types of radiation
- B. Only radiation produced by radioactivity can injure human beings
- C. Radioactive materials emit ionizing radiation, while RF signals have less energy and can only cause heating
- D. Radiation from an antenna will damage unexposed photographic film but ordinary radioactive materials do not cause this problem

The answer is (C). Ionizing radiation actually knocks the atoms around and can change them permanently. The example is taking an X-Ray. The X-rays go through you and permanently change the chemical makeup of the X-ray film, thus giving you an image. The frequency of X-rays (not to be confused with X-band microwaves) is in the giga-giga (10 to the 18th) Hertz, a billion times higher than microwaves.

That is all for this month. Let me know how you like this, and whether it is useful for you.

Area Happenings

FOURTH MONDAY – at 6:30pm, the Greensboro Amateur Radio Association have their regular monthly meeting at Captain Bill's Seafood & Steakhouse, 6108 West Market St., Greensboro, NC 27409. Please plan to gather at 6:30pm for dinner. The meeting is scheduled to start at 7:15pm

CLUB NETS:

SUNDAYS – at 7:30pm, the **Technical Forum** on the 145.150;

- at 9pm, 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.

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

TUESDAYS – at 9pm, the **D-STAR Net** meets on 442.8625 (W4GSO B and Reflector 17C)

WEDNESDAYS – at 8:30pm, **The Guilford Amateur Society Rag Chew Net** holds their weekly net on the 145.250, W4GG repeater with an 88.5 Hz. tone. Jim Hightower, W4JLH is the net control.

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

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 7pm.

THIRD MONDAY – at 6:15pm **The Guilford Amateur Society** holds their monthly meeting at Tex & Shirley's Restaurant in Friendly Shopping Center. Eat at 6:15pm and the business meeting begins at 7pm.

THURSDAY – at 11:15am, Greensboro Hams get together for lunch. Thursday lunch group is meeting at the K&W Cafeteria, 300 Forum VI Mall at Friendly Shopping Center. Talk-in is on the 145.150, W4GSO repeater with a 100 Hz. tone.

EVERY FRIDAY – at 8pm (approximately) Greensboro Hams get together for coffee at Starbucks at Edney Ridge Rd.

The W4VEC Testing Schedule Dec 2012 to May 2013

December 8, 2012

January 12, 2013

February 9, 2013

March 16, 2013

April 13, 2013

May 11, 2013

Location: #3 Centerview Dr,
Hickory Building,
Greensboro, NC 27407

Time: 9:00am

Contact: Glenda Nicholson

Phone: (336) 674-3810

E-mail: ag4nc@bellsouth.net

GARA REPEATERS

145.150 MHz - offset, 100 Hz. tone

442.8625 MHz. + offset, Digital D-Star



Greensboro Amateur Radio Association

P.O. Box 7054

Greensboro, NC 27417

www.w4gso.org

FIRST CLASS MAIL

The Official Publication of GARA