January 2014 VOL XCVIII, ISSUE 7

HARMONICS

1916 South Jersey Radio Association 2014

Happy New Year

From the Officers and Directors of SJRA

HAM TECH

Vol. 5 No. 1 by John - WY2J

wy2j *at* arrl *dot* net

DIGITAL SIGNAL PROCESSING

Part 1 of 4: Introduction to Digital Filtering

Introduction– Signal filtering is one of the most important functions provided in modern Ham rigs. Filters dig the desired signal out of a background of noise and QRM as well as suppress undesired signals generated by the many amplifiers and mixers of a transceiver. Since the introduction of vacuum tubes to radio in the early 1920's the inductor capacitor filter has played an important role in providing selectivity to receivers. HAM TECH covered these early filters in the October and November 2012 issues of Harmonics. The December 2012 issue covered the early crystal filters that dominated high end receivers from the late 30's thru the 50's. Modern multi-pole crystal filters that are used today were presented along with analysis software in Harmonics for January 2013. All of these filters are analog and still used today but as the digital technology continues to advance at a rapid rate, digital filtering is overtaking many analog functions. This four part series is intended to introduce you to digital filtering including: a simplified theory of operation, how it is implemented, how it is interfaced to the analog world of the rig and where it improves on its analog counterpart.

Converting Signals to Digital – If you want to apply digital signal processing to ham radio in your station you must first convert the received analog signal to digital format without losing any information in it and at the same time introduce a minimum of noise and distortion. It may sound simple but it can be a tougher problem than building the digital hardware or writing the software that contains the algorithms that define the details of the implemented functions. In any case the key component is an Analog to Digital Converter a device that repetitively samples the analog signal, accurately measures the amplitude and encodes it into typically a 12 to 16 bit word to obtain a 72 to 96 dB dynamic range. To obtain all of the information in the analog signal with reasonable pre-conversion analog filters, it must sample at a rate of at least 2.5 times the highest frequency present, made up of the carrier frequency plus the upper modulation sideband. If you are doing some easy DSP like running the PSK-31 mode in a PC with the

(Continued on page 4)

SOUTH JERSEY RADIO ASSOCIATION

HARMONICS is published monthly and is the official news letter of the South Jersey Radio Association. The SJRA was established on June 16, 1916 and has been meeting continuously since it's inception. The club has been affiliated with the American Radio Relay League since 1920.

The SJRA meets each month on the fourth Wednesday, January through September; and usually the third Wednesday, October, November and December; in one of the Meeting Room of the Gibson House at 525 East Main Street, Marlton, NJ 08053. Visitors are always welcome at our general meetings. **"Our Meetings are Smoke Free"**

SJRA operates the K2AA Repeater (145.290 - PL 91.5) located in Medford, NJ and the K2UK Repeaters (146.865 and 442.350 - PL 131.8) located in Pine Hill, NJ. The repeaters are open for use without restriction to all licensed amateur operators.

There are currently over 100 SJRA members active in most all aspects of amateur radio. Membership is by application and is subject to the approval of the Board of Directors. Club dues are currently $30/yr. for memberships, $22.50/yr for retired-person membership (62 plus 1 yr membership), and $15/yr. for additional family members and student membership. Membership information is available on the K2AA Repeater or from Mary Von Lintig, KV2M, 856-772-6475

EMAIL: sjra *at* sjra *dot* org SJRA's web page www.sjra.org

Mark O'Brien, K2AX, is the SJRA/ARRL VUCC card checker

Joe Fisher, KC2TN, is the SJRA/ARRL WAS card checker

Harmonics is now available on the WEB in pdf format at:
http://www.sjra.org
South Jersey ARRL Section News is available on the WEB at:
http://www.arrl.org/sections/?sect=SNJ

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Harmonics Staff:

Publisher/Editor: Ted Groke, W2TAG or Don Beaulieu, WA2DUE
Circulation: Mary VonLintig, KV2M; Jim Vecchiola, KR2T

LOCAL WEEKLY NETS

Monday	K2AA, Medford	145.290 @ 8PM
Thursday	Various Locations	28.405 @ 8PM

Harmonics Deadline

Articles submitted for the next HARMONICS will be accepted until Monday, February 10, 2014. Email:
ted.w2tag *at* gmail *dot* com

SWAP SHOP - For Sale/Wanted ads are free of charge and are accepted for Amateur Radio related items only. While ads are not restricted to SJRA members, there is only limited space available and members have priority for listings. No items will be accepted for inclusion in the Swap Shop from commercial vendors or traders. All ads must be submitted at least three weeks prior to the scheduled SJRA general meeting date.

GENERAL ADVERTISING - Limited commercial advertising is accepted on a space available basis. Annual advertising rates range from $25/yr (Min 1/8 page) to $200/yr (Full Page). Information is available from Ken Botterbrodt, K2WB.

Meeting Minutes

Minutes of meeting of 12/18/13

The meeting was opened at 1850 at the Gibson house, with a flag salute and a welcome to all by Ken, K2WB. Minutes of the November meeting were approved as printed, motion by N2HQL/KR2T. The treasurer, N3RG had no report, but stated 130 paid up members.

Health & Welfare by Kathy, KM2KME: Bruce, W2BE, had a mild heart attack and is recovering at home. He sent greetings to all, with a special Hi to Jack, N2VW.

DX by Jack, N2VW: Look out for OF9X / OF9SCL on 14.235 for reports on Santa.

Joe, KC2TN, reported all repeaters working. He is still taking orders for "Club Stuff."

Nets by WY2J: 2M up to a dozen, 10M still needs 2 net controls.

EPIC engineering made a donation of SJRA stickers. They can be had for a donation of $1.00 per sheet.

Programs by Kathy, KM2KME: January is another auction, items for consignment may be brought for a minimal fee.

A moment of silence was held for all members who passed this past year.

Mario, N2AK, presented Part 2 of this years 40M CW QRP kit.

The following awards were presented:

Youths- Noah Weinstein, Jordan Bookstaber and the O'Brien girls.

Amateur of the year: Al, N3AVT, who started the new SJRA testing team, Al stated it was a group effort.

Gordon Kressel: Kathy KM2KME

Miles Brown Technical Achievement: John Fogelboch, WY2J; Mario, N2AK; and Ray, N3RG.

W2ORA Ambassador of the Air: Don Beaulieu, WA2DUE

During the dinner, Ken, K2WB, announced that Ted, W2TAG, was absent due to the passing of Vickie, his XYL.

No board meeting will be held in January due to a conflict with the New Years holiday.

Please Note:

The 2014 SJRA Dues are now being accepted by our Treasurer, Ray, N3RG.

Club dues are currently $30 per year for full memberships, $22.50 per year for retired-person memberships, and $15 per year for additional family members and student memberships.

Dues can be sent as follows:

Ray Golley
552 Newport Road
Millville, NJ 08332

Make checks payable to:

"South Jersey Radio Association."

(Ham Tech** from page 1)

audio output of your SSB transceiver serving as the signal source, then the 16 bit 8 KHz sampling rate Sigma Delta A/D chip on your computer sound card fills the bill. If you fell in love with Software Defined Radio (SDR) and dream of hanging you're A/D converter directly on your antenna then you have created a monster of a problem for the A/D. To directly convert 160 to 10 meters you need at least a 75 MHz 16 bit converter. A single conversion analog receiver with a 4.5 MHz IF output makes for a much easier conversion problem. There will be more on A/D converters and how to use them in later issues of this series.

Baseband Conversion – The carrier based signal can be processed either in an amplitude and phase format or at baseband using a complex arithmetic format also known as I and Q processing. The latter I/Q format is almost universally used in DSP because it reduces the required computations to mostly addition and multiplication which are fundamental digital hardware building blocks. The conversion from amplitude and phase to I/Q is done with a product detector either by analog means with two mixers ahead of two A/D converters or after it with two multipliers and a digital local oscillator. The analog approach places extreme tolerances on the gain and phase matching of the two mixers and A/D converters so the digital approach is much preferred.

Mathematics of Complex Numbers – With I/Q processing we are performing mathematical computations using complex numbers and complex arithmetic. The digital words are of the form (a + jb) where a is real and jb is imaginary. The mathematical operator j is equal to the square root of -1 or $j^2 = -1$. The digital logic of the DSP components don't recognize complex numbers so we do the arithmetic in pieces according to the following equations for the most commonly used computations.

Complex Addition:

$(a + jb) + (c + jd) = (a + c) + j(b + d)$

Complex Multiplication:

$(a + jb)(c + jd) = (ac + jbc + jad + j^2bd)$

where $j^2 = -1$

$(a + jb)(c + jd) = (ac – bd) + j(bc + ad)$

Complex addition and subtraction which is just addition with a negative number requires two real additions and no multiplications. Complex multiplication requires four real multiplies and two additions. Note that like addition we did not count the + sign between the real and imaginary terms in the answer because we carry the two terms as separate digital words. Division, square roots and other mathematical operations are far more complicated and require more steps but are used in DSP far less frequently.

Fundamental Filter Types: - There are two fundamental types of digital filters, finite impulse response (FIR) and infinite impulse response (IIR). All analog filters are IIR. The difference between them is that FIR filters have a finite signal memory, no internal feedback, good phase linearity but require more stages or computations than IIR for a given skirt selectivity. The IIR design has signal memory that usually decays exponentially due to feedback from output to input, has poorer phase linearity but requires less hardware and fewer computations for a given skirt selectivity. The IIR nature of analog filters is due to the storage of electrical current and voltage in their inductors and capacitors that decay exponentially.

An impulse is a very short pulse of signal with respect to the sample time interval

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that has essentially a flat frequency spectrum over the pass band of the filter. It is fundamental to the mathematics of filters and will be discussed in future parts of this series. Only the FIR design will be covered in this series of articles.

The FIR filter can be visualized as a long multistage shift register memory with a tap at each stage feeding a complex multiplier. The time samples of the signal which are fed into the shift register memory will eventually arrive at each multiplier where they are multiplied by a set of filter coefficients and the multiplier outputs are all added together to form the desired filtered signal output.

Figure 1 below depicts the first four stages of this process.

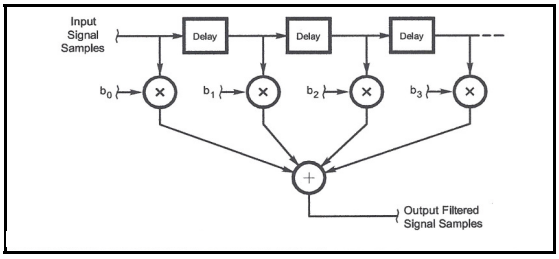

Figure 1 – FIR Filter Signal Processing Functions.

In a real world implementation the signal samples would enter a multiplier and be multiplied by the appropriate filter coefficient, added to the last output sample retrieved from an accumulation memory and then returned to that memory. When all signal samples have been processed, the accumulator memory holds the final filter output answer. Since a practical filter may require 100 or more sections requiring 400 real multiplies and 200 additions in a time interval of 100's of microseconds, a high speed hardware Multiplier Adder Accumulator (MAC) co-processor is usually used for the heavy lifting of multiplication and addition.

Next month we continue with the FIR filter exploring sizing and implementation of a real world filter. We will also explore the Discrete Fourier Transform (DFT) and the Fast Fourier Transform (FFT).

The SJRA would like to congratulate the following on their recent accomplishments. Session date: 01/08/2013

David Beach
81 Morgan St.
Sicklerville, NJ 08081
Earned his Tech

Michael Covaleski
7 Cavesson Tr.
Sewell, NJ 08080
Earned his Tech

Brian Dawson
1705 Rockcrest Ct.
Williamstown, NJ 08094
Earned his Tech

Anthony DeSandro
644 Good Intent Rd.
Blackwood, NJ 08012
Earned his Tech

Brian Gross
154 Merion Cr.
Marlton, NJ 08053
Earned his Tech

Joseph Lambarski
143 Tuckerton Rd.
Shamong, NJ 08088
Earned his Tech

James Mualem
12 Tether Cr.
Deptford, NJ 08096
Earned his Tech

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An Almost Century Old Record Becomes History

It seems that records are made just to be broken. Past Olympic records are broken during each new Olympic Games, and those records are certain to crash during future Olympic Games. We are faster, stronger, and are better coordinated each year, and have more endurance, but time puts most records into the history books.

For nearly a full century, one SJRA record remained unbroken, but alas, even that record has fallen. Our great radio club was born during June 1916, and her first President was C. Waldo Batchelor. He guided SJWA from her birth in 1916 to June 1922, a six-year term. His leadership was the cornerstone on which SJRA was built. Future presidents looked to him for direction and his guidance put us on the path to greatness. I think someone once said 'He who controls the past controls the future.'

Now one man has not only broken but has shattered this SJRA record. Ken Botterbrodt – K2WB is that man. Ken Botterbrodt, K2WB, has been President of South Jersey Radio Association for over six years. He took the reins of leadership in June 1997 and held that high office until June 1999 for a total of two years. Elections for the year 2009 again placed Ken as President. And by popular vote, Ken remains our leader as of January 2014, holding the highest office for six years and seven months, and breaking the record set by our first President. Let me mention some other call signs held by K2WB. Hope I did not miss any of them – WA2CVJ, WA2CZJ, WA2UAD, WN2UAD, VP5/K2WB, JF9IXC, JF1DFC, and VP5T. My apologies if I missed any or got any of them wrong.

Prior to serving as President, Ken has been Vice President and also served on the Board of Directors. He has been our Field Day Chairman since almost forever. He also has been responsible for several Special Events. K2WB is also 'Johnny on the Spot' whenever anyone needs help. He is not afraid to get his hands dirty. I remember one freezing cold January we had trouble with our antenna and there was Antenna Doctor Ken at our door with a bag of tools, strong hands, and a good brain. Yes folks, he made everything all better.

We as members of South Jersey Radio Association really know how to choose the best to guide our club. Leadership is not just making critical decisions, it is being willing to help in any way possible, to be open minded, to listen to others, to have a sense of humor, and also to have a heart of gold. Our current president possesses all of these attributes and many more.

I once asked Ken what his most memorable event was in serving all those years as our President. His reply was 'The birth of my grandson.' I see in our future a President with the first name of Logan. Thank you Ken, K2WB, for all your years of selfless service. I am grateful that you will lead our club for the New Year 2014.

73 to all and I am History
Mary, KV2M

List Your "For Sale" Ham Stuff in the SJRA Harmonics

Email Ted, W2TAG, with your listing, ted.w2tag *at* gmail *dot* com

An Open Letter from Mario, N2AK, to all SJRA Members Who Built His 40 Meter CW Transmitter Kit that goes with His 40 Meter Receiver Kit

I owe you a tune-up procedure for the transmitter kit. I will shortly email it to everyone who has purchased a kit. I hope that this project is enjoyable to you and that you get a neat little transmitter to use when it's done.

I attached a picture of my transmitter and receiver kits (which is shown above, *editor*) on the air during a recent DX contest. In about 15 minutes, I was able to make contacts in five different countries. The transmitter is very efficient and beats most QRP commercial rigs in low battery current.

I will be available to help you with any questions and problems. My home phone is 609 654-8916. Also, If anyone wants to bring their kit to my QTH in Medford, the door is open.

Look for the tune-up procedure in the next few days. For those who did not get the part 2 of the kit (the enclosures) I will have them at our next meeting.

73, Mario , N2AK

Monthly Puzzle

Don—WA2DUE, wa2due *at* arrl *dot* net

Last months puzzles were:

Find the area of a circle that circumscribes an equilateral triangle with each side 100 feet long.

Solution: Draw an equilateral triangle. All angles in this triangle are equal with a value of 60 degrees. Bisect one of the angles and draw the bisector to the opposite side. This divides that side with two 50 foot line sections. Now bisect another angle and draw the bisector to the first bisector. This forms a right triangle with 30, 60, and 90 angles and one side of 50 feet. The hypotenuse is the required radius of the circumscribing circle and is equal to the cosine of 30 times 50. Thus the radius is 57.74 feet. The area of a circle is pi times the square of the radius. The answer thus becomes 10,472 square feet.

What time does it take for a radio signal to travel from the Earth to the planet Mars? The planet Mars distance from Earth varies from 54 to 103 million km. Speed of light is 299,792,458 meters per second.

Solution: Converting the distance from kilometers to meters and dividing by the speed of light the answer becomes 180 to 344 seconds or 3 to 5.73 minutes.

Fred, W2EKB, sent in his solution to one of the puzzles. Thank you Fred. Ken, K2WB, worked on a puzzle I had discussed on the 10 meter SJRA net. Thank you Ken.

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Protect your gear from ESD

Dan, KB6NU, cwgeek *at* kb6nu *dot* com

Electrostatic discharge, or ESD for short, has been a concern for anyone involved in electronics ever since we made the transition from vacuum tubes to transistors. I was schooled about ESD when I worked as a test engineer for a company called Doric Scientific shortly after I got out of engineering school, and I wrote about it when I was an editor for Test & Measurment World magazine back in the 1990s. If anything, it's even more of a concern today as electronic components get ever smaller.

In 1991, Bryan P. Bergeron, NU1N, published a two-part series on ESD (part 1: http://www.arrl.org/files/file/Technology/tis/info/pdf/9104019.pdf, part 2: http://www.arrl.org/files/file/Technology/tis/info/pdf/9105028.pdf) in QST. His suggestions about how to prevent ESD damage are as good now as they were 20 years ago:

♦ Consider using a room humidifier to increase the relative humidity in your shack, or wherever you work on electronic equipment to 65 percent RH or higher.

♦ Use grounded wrist straps when handling ESD-sensitive devices.

♦ Use grounded, anti-ESD work mats when working on electronic equipment.

♦ Use a grounded soldering iron and anti-static tools.

♦ Use anti-static bags and containers for storing and transporting electronic equipment.

♦ Connect the chassis of all your gear to a good earth ground.

♦Consider a desktop ionizer to neutralize static buildup on your workbench.

I might also add consider grounding the chairs that you use in your shack or discharging yourself after getting up from the chair in your shack. I know that the worst electrostatic discharges that I experience are after I get up from my chair. You can even buy ESD-safe chairs (http://www.all-spec.com/products/Benches_and_Chairs%7CChairs_and_Accessories%7CCHR-00/), but they are kind of expensive.

Personally, I use an anti-static mat that I originally purchased for use with a computer keyboard and a wrist strap that was given to me by an ESD consultant when I worked for the magazine. I use these religiously when building kits or working on any solid-state gear.

It's not hard to find anti-static products. Radio Shack sells a wrist strap for only $1.23 (http://www.radioshack.com/product/index.jsp?productId=2103245)! You can find a whole range of anti-static products on Amazon, too. Wherever you get them, they're a good investment.

• •

When he's not worrying about ESD, Dan, KB6NU enjoys teaching amateur radio classes and working CW on the HF bands. For more information about his operating activities and his "No-Nonsense" series of amateur radio license study guides, go to KB6NU.Com or e-mail cwgeek@kb6nu.com.

SJRA Announcement

Anyone willing to present a presentation at one of our club meetings or if you have a great idea for a speaker/topic, please contact Kathy Edwards, KM2KME, by sending an email to: katiemae513 *at* gmail *dot* com.

DAYTON HAMVENTION NEWS

"The South West Ohio DX Association (SWODXA) is pleased to announce that we will again sponsor the DX Dinner, held in conjunction with the 2014 Dayton Hamvention®. This, our 29th annual dinner, will be on Friday, May 16th, 2014, at the Dayton Marriott, 1414 S. Patterson Blvd., Dayton, OH 45409. There will be a cash bar starting at 5:30 p.m., with dinner served at 7:00. Following the meal, there will be a separate room and cash bar available for more fellowship.

This is an excellent opportunity to meet new hams and to renew old acquaintances as well as to learn about past DXpeditions and those in the planning stages. The Marriott is very accommodating to a group our size. The dining room is on the ground floor so there are no steps, the dining room is very large, and there is ample free, on-site parking.

This dinner is always well attended by some of the most avid DXers in the world. As in the past, there will be some major door prizes, and there is always great anticipation as to who will be named the 'Dxpedition of the Year'.

The Marriott is a large hotel with many room choices. Should you need accommodations, their website is <http://www.marriott.com/hotels/travel/dayoh-dayton-marriott> and their phone number is 937 223-1000.

Program details and a list of the prizes will be on the website as they become available and updates will be sent out regularly via Twitter.

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President's Message

Ken – K2WB

2014 is finally here, I like to wish everyone a very Happy and Healthy New Year.

Congratulations to all of the award winners of the SJRA awards this year.

With the help of the Board of Directors I have compiled a list of Top 10 things to do in 2014. These are in no particular order.

- ♦Check into the SJRA Nets (we have two).
- ♦Help an older Member come to a meeting
- ♦Participate in a Club sponsored contest like November Sweeps or VHF Contests
- ♦Help a new ham get on the air
- ♦Help with Field Day
- ♦Volunteer for a committee
- ♦Show children or someone amateur radio
- ♦Encourage someone to join the SJRA
- ♦Make a suggestion to the Board of Directors
- ♦Write an Article for Harmonics or the web site

Our treasurer Ray, N3RG, has indicated that renewals have been coming in. If you have not renewed your membership please do so soon. Don't forget to update your information such as email address and mailing address so that you can continue to receive Harmonics.

Please indicate if you still want to receive Harmonics by regular mail with your renewal.

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DXCC COUNTRY/ENTITY REPORT

According to the AR-Cluster Network for the week of Sunday, 5th-January, through Sunday, 12th-January there were 216 countries active. Countries available::

1A, 3A, 3B8, 3V, 3W, 4J, 4L, 4O, 4S, 4U1I, 4X, 5A, 5B, 5H, 5R, 5V, 5W, 5Z, 6W, 6Y, 7X, 8P, 8Q, 8R, 9A, 9H, 9J, 9K, 9L, 9M2, 9M6, 9Q, 9V, 9X, 9Y, A4, A6, A7, A9, AP, BV, BY, C2, C3, C5, C6, C9, CE, CE0Y, CE9, CM, CN, CP, CT, CT3, CU, CX, D2, D4, DL, DU, E5/s, E7, EA, EA6, EA8, EA9, EI, EK, ER, ES, EU, EX, EY, EZ, F, FG, FH, FJ, FK, FM, FO, FP, FR, FW, FY, G, GD, GI, GJ, GM, GU, GW, H4, H40, HA, HB, HB0, HC, HI, HK, HL, HP, HR, HS, HV, HZ, I, IS, J2, J6, J7, J8, JA, JD/o, JT, JW, JY, K, KG4, KH0, KH2, KH6, KL, KP2, KP4, LA, LU, LX, LY, LZ, OA, OD, OE, OH, OH0, OK, OM, ON, OX, OY, OZ, P2, P4, PA, PJ2, PJ4, PJ7, PY, PY0F, PZ, S2, S5, S7, SM, SP, ST, SV, SV5, SV9, T7, T8, TA, TF, TG, TI, TJ, TK, TL, TR, TU, TY, UA, UA2, UA9, UK, UN, UR, V3, V4, V5, V6, V7, V8, VE, VK, VP2E, VP8, VP8/h, VP9, VQ9, VR, VU, XE, XU, XW, XX9, YA, YB, YI, YL, YN, YO, YS, YU, YV, Z3, ZA, ZB, ZD7, ZD8, ZF, ZL, ZP, ZS, ZS8

* PLEASE NOTE: The report "could" contain "Pirate/SLIM" operations or more likely a "BUSTED CALLSIGN". As always, you never know - "Work First Worry Later".

***(Dayton News** from page 9)*

Check out our Facebook page at 'Southwest Ohio DX Association', or follow us on Twitter – @SWODXA " Preliminary Information from Bill Salyers – AJ8B (AJ8B *at* arrl *dot* net)

***(Presidents Message** from page 9)*

The club has an email list that is a great way to reach out to all of the members of the club if you have a question or an item for sale. This service is only available to members of the SJRA and will be the only to receive harmonics by email. If we have your email address you will be receiving an email from sjra-members-resquest@mailman.qth.net inviting you to join the list or you can join directly by going to http://mailman.qth.net/mailman/listinfo/sjra-members. Remember to include your Call sign with your name.

To send an email to the list, just send it to sjra-members@mailman.qth.net and it will go to all of the members in the list automatically.

***(Monthly Puzzle** from page 7)*

For the new year give these puzzles a try:

A test of 15 math problems is given. The first question is worth 5 points and the subsequent questions are worth 3 points more the previous question. What is the maximum score that can be earned?

What value of capacitance is required to create a resonate circuit at 21.2 MHz if you have an inductor of 2 microhenries?

Please submit solutions and/or comments to wa2due *at* arrl *dot* net.

***(SJRA Congratulations** from page 5)*

Burton Sampley, KC2OUC
726 Pennsylvania, Ave.
Palmyra, NJ 08065
Earned his Extra

	Tech	General	Extra
YTD	36	8	7

SJRA Jackets, Shirts, Hats

Order NOW – Next order going in soon!

Spring Jacket is $44 (S,M,L,XL), Fall Jacket is $55 (S,M,L,XL),
Shirts are $27 (S,M,L,XL), Hats are $25 (one size fits all)
Name and Call Sign embroidery included….Larger sizes slightly more!
Email Joe, KC2TN, with orders or additional info:
kc2tn *at* comcast *dot* net

Amateur Radio FCC License Testing

The SJRA sponsors *FREE* Amateur Radio FCC License testing on the second Wednesday of each month. The location is: 443 Commerce Lane, Suite 5, West Berlin, NJ 08091. Registration is at 7:00 PM and testing begins at 7:30PM. Walk-ins are accepted.

VE team members can be reached at VE@SJRA.org. A calendar and more information can be found on the SJRA web site.

January Meeting
Forth Wednesday

January 22, 2014

"Our Meetings are Smoke Free"

The meeting commences promptly at **7:30PM** in the first floor Meeting Room of the Gibson House on Main Street, Marlton, NJ 08053. Guests are always welcome.

Program For January:

Our program for January is the annual "Estate Auction" for the benefit of the estates of past members who are now SK. This year we are featuring many items from the estate of John Mac Kenzie, KA2QNV-SK. (Start looking at all your "treasures" around your shack in preparation for next month's meeting when the program will be "The White Elephant Auction.")

January 2014 Health and Welfare:

Happy Birthday to those celebrating in January: 2, Joe Fisher KC2TN; 12, Robert Seeland; and 28, Paige O'Brien. Any reports for Health and Welfare can be made to Kathy Edwards, KM2KME, by sending me an email me to: katiemae513 *at* gmail *dot* com.

Kathy Edwards, KM2KME

First Class Mail

South Jersey Radio Association
PO Box 1026
Haddonfield, NJ 08033