



HARMONICS

1916

South Jersey Radio Association

2015



A New Heathkit! So, Why Am I Not Excited?

Dan, KB6NU, *cwgeek at kb6nu dot com*

A couple of weeks ago I got an e-mail from Heathkit. Yes, the NEW Heathkit. you might remember that a couple of years ago, there was all this hype about a "new" Heathkit and how they were going to start designing new kits as well as revive popular old designs.

Then, nothing. They went completely quiet—until a couple of weeks ago. In an e-mail sent to their "insiders," they say:

"Dear Heathkit Insider,

'What I really hope Heathkit will produce,' a Silicon Valley colleague recently told me, 'is a new radio kit with a beautiful finish, maybe in rosewood.' Something great to enjoy building and learn from, and also visually stunning, so he could put it in his living room and keep it forever.

"Today, my friend gets his wish.

They then go on to explain all of the work they've been doing in relocating Heathkit to Santa Cruz, CA, acquiring a second company, and securing all the intellectual property rights to the old Heathkit manuals and logos (meaning no more bootleg copies on the Internet). The e-mail continues:

"That's a lot, but there's more. We've designed and developed a wide range of en-

tirely new kit products. We authored the manuals for these kits, complete with the beautiful line art you rely on, preserving and respecting our iconic historic Heathkit style. We developed many new inventions and filed patents on them.....We built the back office infrastructure, vendor and supply chain relationships, systems, procedures, operations methods, and well-thought-out corporate structure that a manufacturing company needs to support its customers, to allow us to scale instantly the day we resume major kit sales. All this effort enables us to introduce a fleet of new kits and helps ensure Heathkit can grow, prosper, and continue to bring you great new products for a very long time."

So, what's the exciting news? A new QRP transceiver? Maybe a shortwave radio? A new 100-in-1 experimenter kit for Makers?

Uh-uh. Sorry. The "exciting" news is a tuned radio frequency (TRF) AM band (yes, I said AM band) radio kit that costs \$150 (<https://shop.heathkit.com/shop/product/explorer-jr-trf-am-radio-receiver-kit-black-case-gr-150-bk-16>). Not only is that crazy expensive for an AM radio, it doesn't even come with a speaker. On top of that, there's no soldering. You screw all of the components to the board. I'm speechless (well, figuratively, not literally).

(Continued on page 10)

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 its 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@sjra.org SJRA's web page: www.sjra.org

SJRA VE Team: ve@sjra.org is the SJRA/ARRL VUCC card checker

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

 ★ **Harmonics** is now available for SJRA members 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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Repeater: Joe Fisher, KC2TN
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Nets: John Fogleboch, WY2J
Publicity: **Vacant (Please Volunteer)**
Picnic: **Vacant (Please Volunteer)**
Ways & Means: Ray Golley, N3RG
Property: Jon Mac Millan, W2MC
Web Site: Ira Weinstein, W2IRA

Harmonics Staff:

Publisher/Editor: Ted Groke, W2TAG
Alternate Editor: Rick Stoneking, W2RDS
Circulation: Mary VonLintig, KV2M; Jim Vecchiola, KR2T

LOCAL WEEKLY NETS

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

Harmonics Deadline

Articles submitted for the next Harmonics will be accepted until Monday, December 7, 2015. Email: ted.w2tag@gmail.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

General Meeting Of Oct. 28, 2015

The meeting opened at the Gibson House at 1950 with a flag salute. Ken, K2WB, announced that K2AA would be on the air for both weekends of November sweeps from the command trailer located in his driveway, i.e., on November 7/8 for CW and November 22/23 for SSB.

The minutes of the September meeting were approved as printed, motion by N2HQL/KE2D. New member Mark, KD2JPW, was introduced.

Health & Welfare- November cards are ready to send. A sympathy card was sent to the family of Ben Heady. Ray, N3RG, gave the treasurers report, including the member count at 105. Report was accepted on motion by KR2T/WB2EOD. No program listing or Awards reminder were made.

Contests- Sign up sheets for the November SS were available. John mentioned the Zombie Shuffle on Oct 30 from 6 PM till midnight, CW QRP was the mode. Besides the November SS, the CQWWDX contest is Friday November 27th starting at 6 PM for 48 hours.

The repeaters are working well, the new fusion repeaters have been ordered. There are items of Club stuff available for order, they make great Christmas gifts. Mugs are avail for \$10, car magnets will be available at the November meeting (3rd week) for \$5.

Remember the Christmas dinner is on December 9th at 7 PM.

Articles are needed for the 100th Anniversary timeline. Please submit you best, worst, or most meaningful events in the club.

Field day results came in! We were 4th place in 6A. Ken, K2WB, made his usual motion to fire the field day chairperson and, as usual, the motion died for lack of a second.

We had a short break, then started the program, "Gridless Power", presented by Jason Halpern.

Board of Directors Meeting of Nov. 4, 2015

Meeting opened at 1930 at the Gibson House. First order of Business was the approval of the minutes of the October Board meeting. A motion to accept was made by N2HQL/WB2EOD but a challenge was made to the minutes as printed. Rick, W2JAZ, stated that the wording was incorrect as his discussion on "downgrading" the awards was driven as a cost item not to devalue the importance of the awards but to gain extra finances, which could be reallocated to such projects as internet connections to the repeaters for linking or control. The minutes were accepted as amended.

Treasurers report was read by Lou, N2HQL, and accepted on motion by N2HQL/N3AVT. After some discussion, a motion was made by KV2R/N3AVT to keep the dues structure the same.

Ken, K2WB, and Joe, KC2TN, went to Penn Wireless meeting for a demo of their

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HAM TECH

Vol 6 No. 11 by John - WY2J

wy2j at arrl dot net

Giving Ham Radio a Voice

Part 2 of 3: High Power AM

Introduction - All of the AM modulation techniques described last month in part 1 of this series had a serious flaw that precluded kilowatt level power in ham transmitters. This was the poor plate efficiency of grid modulation and modulators running class A single ended. Modulating the plate of class C RF amplifiers preserved the reasonably high, 65 to 75 percent, efficiency of the class C designs. But it took the introduction of the high power push pull class B audio amplifier with transformer coupling to the class C RF amplifier to achieve a practical design ham transmitter in terms of powering it. This article focuses on the class B vacuum tube modulator and two high end AM ham transmitters build by Collins in 1932 and 1950 that used them. Hopefully it will give the reader a feel for what a monster high power AM transmitters were compared to even higher power solid state SSB today.

Class B Audio Amplifiers - Transformer coupled class A amplifiers have a theoretical efficiency of 50 percent in converting DC to audio power but with tubes that cannot be build and totally lossless transformers. Good practical designs seldom exceed 35 percent. The push pull class B audio amplifier's theoretical efficiency is 78.5 percent and efficiency near 70 percent can be achieved with high amplification factor triodes operating with high plate voltages. This is important because a 1 KW input AM transmitter requires 500 W of audio power to achieve 100 percent modulation. At 70 percent efficient the class B unit draws 715 W DC and about 900 W of AC line power. The class A design

would draw twice this power or 1430 W DC, 1800 W AC line. Adding in the 1,000 W DC, 1250 W AC line for the class C final requires a total line drain of slightly over 2 KW for the class B modulator transmitter and 3 KW if we use class A modulators. And legal limit AM transmitters yield an output of about 750 W or half that of today's legal limit SSB rigs.

Figure 1 below is a 350 W output class B modulator from the mid 50's era. It mounts in a standard 19 inch relay rack of the era.

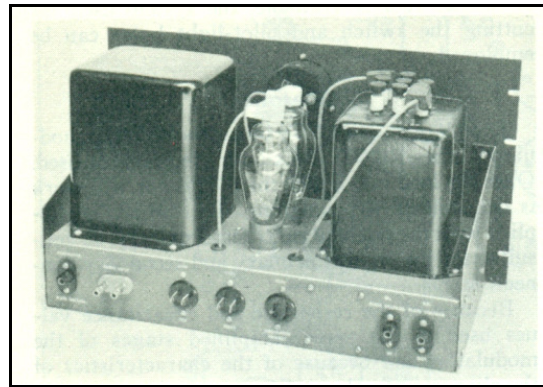


Figure 1, 350 W Class B Modulator Using 811-A's

The tubes are our old friends the 811-A that are still used in GG RF linear amplifiers for SSB today. Eighty years ago they were designed for class B audio amplifier use. They will operate with up to 1250 volts on the plates at zero grid bias and just -4.5 volts for 1500 volts. This is a big advantage since it keeps a constant load impedance on the audio driver stage that supplies a few watts of power to the 811-A grids.

The high power modulation transformer is to the left of the tubes and the inductor of the splatter filter is to the right.

(Continued on page 5)

(Ham Tech from page 4)

Figure 2 below shows the circuit design of this filter.

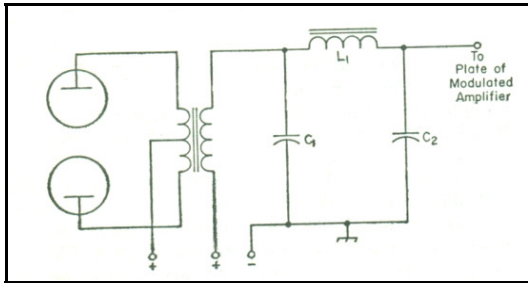


Figure 2, Modulator Output and Splatter Filter

The splatter filter is used to reduce out of band spurious signals resulting from harmonics of the audio when the modulator over drives the class C final amplifier. This occurs when the audio gain is too high and 100 percent modulation is exceeded in the negative direction.

Tubes that were commonly used for high power class B modulators are shown in Table 1 below.

Tube	E _{Plate}	E _{Bias}	P _{Drive}	P _{Output}
811-A	1500 V	- 4.5 V	4.4 W	350 W
572-B	2000 V	0 V	5 W	530 W
810	2250 V	- 60 V	13 W	725 W

The 811-A and 572-B are still around today and used in HF GG linear RF amplifiers for ham SSB and CW.

DC Power Supplies - In the first half of the 20th century there were no silicon diode power rectifiers or switcher power supplies. Ham radio power supplies were 60 Hz high

voltage transformers driving full wave vacuum or mercury vapor rectifiers followed with iron core choke inductors and electrolytic or oil filled paper capacitors. Vacuum tube rectifiers like the 5R4GY were limited to about 750 Vdc and 125 watts output with up to 67 volts drop across the tube.

Higher power applications depended on two mercury vapor tubes, the 866A and 872A. Two 866A's, in a full wave circuit with a choke input filter, could supply up to 1.5 KW at 3000 volts DC. The 872A was a higher power tube. A pair in a FW choke input circuit could supply up to 8 KW at 3000 volts DC. These tubes required operation at temperatures of 35 to 45 degrees C with a filament warm up of 20 minutes before use. The advantage of mercury over vacuum was a tube drop of less than 10 volts. Filament power for a pair of 866A was 25 watts and 75 watts for a pair of 872A. There were no other choices for ham transmitters above about 150 watts.

Vintage High Power AM Transmitters - Figures 3 and 4 are photos of two Collins high power AM Ham transmitters using class B modulators. Figure 3 is the Collins Model 150B first sold in 1932 for \$350. It was a 150 watt AM design and was taken to Antarctica in 1934 by Admiral Richard Byrd on his exploration trip. It was the communication link with the US.

The KW-1 marketed by Collins in 1950 was the Cadillac of ham transmitters in its 5 1/2 ft high cabinet and selling for \$3850 in 1950, about \$51,000 today calculated from inflation in the price of bread.. It used a pair of Eimac 4-250A tetrodes in the final and 810 modulators. It was luxury but what it took to put a KW phone on the air in 1950.

(Continued on page 6)

(Ham Tech from page 5)

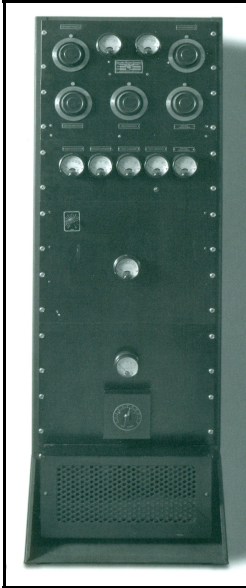


Figure 3, Collins 150B AM Transmitter circa 1932



Figure 4, Collins KW-1. 1 KW CW, AM and NBFM Transmitter with VFO Exciter. circa 1950.

Price Inflation of Bread - In 1951 your author, then 15, had a summer job in a German bakery in Erie, PA. Here he assisted in making and selling bread, for \$0.15 a loaf. Last month, while visiting in Erie, I stopped into the same German bakery and chatted with the owner, the grandson of the 1950's owner. He still makes the same bread but sells it for \$1.99 a loaf. Therefore inflation is $1.99/0.15 = 13.27$ in 64 years, a better number than the Fed issues.

Next Month - We finish up this historic look at Giving Ham Radio a Voice with a look at a short lived voice mode, Narrow Band FM (NBFM), and the post WW-2 battle with TVI aka television interference.

Monthly Puzzle

Don – WA2DUE, wa2due at arrl dot net

Last month we presented the following:

A ship had a room called the “Crypto Room” where messages were encoded and decoded. On the only door to this room was a keypad lock which would open upon the insertion of four digits in correct order. The last digit was one more than the first digit, the first digit was four less than the second digit, and the third digit is double the last digit. The middle two digits were the same. Can you unlock this door?

Answer: Designate the order of digits A B C D. From the clues $D = A - 1$; $A = B - 4$; $C = 2D$; and $B = C$. By substitution we find the number 2663 as the answer.

A fraction has a denominator which is 13 larger than the numerator. If 3 were to be added to the numerator the fraction would be equal to one-third. What is the fraction?

Answer: We can write this equation $(N + 3)/(N+13) = 1/3$. Multiplying both sides by $3(N+13)$ we get $3N + 9 = N + 13$, which resolves $2N = 4$. Therefore $N = 2$ and the fraction in question is $2/15$.

Mark Walters, KD2JPW, submitted his puzzle solutions. Thank you Mark.

For November we pose the following:

The product of the ages of a amateur and his “elmer” is 1674 and the difference of their ages is 23 years. The “elmer” was older than this amateur. Can you figure out their ages?

A 33k resistor is connected in series with a 47k resistor to form a simple circuit.

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President's Message

Ken – K2WB

Our Holiday Party (December 9th) the entire meeting and meal will be held at the Gibson house. After dinner there will be presentation of the club awards. Contact Rich, KV2R, and let him know if you plan on attending. Check out the web site for more detailed information.

Please contact Rich, W2JAZ, regarding nominations for Awards, the sooner the better. When doing so, give the member's name, the reason for your nomination, and the award you are recommending. Award information can be found on the SJRA web page at www.sjra.org.

By the time Harmonics comes out the November Sweepstakes CW portion of the contest will be completed. Many thanks to Bob, KE2D, John, W2FDJ and Pat, KD2P for manning the K2AA club station this year. There is still a chance for you to sign up to operate the Single Side Band part of the contest contact me if you are interested in getting in the K2AA operating schedule. If you operated either or both contests send a copy of your summary sheet to John, W2FDJ. Don't forget to list the South Jersey Radio Assn. as your affiliated club.

Field Day Results are in and it was tough year (conditions on the east coast were difficult but we still managed to pull off fourth place in 6A. This could not have happened without everyone who helped. Field Day 2016 planning is already started. Think of what you can do to help.

There is still time to let John W2FDJ know if you participated in other contest, let him know.

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100th Anniversary Happenings

Ken – K2WB/100

So far the 100th anniversary committee has had 13 meetings (many more to come). Just to keep everyone up to date here is where we are.

Over 65 coffee cups have been sold. There are plenty more to go. Mugs may be acquired to SJRA members by a minimum donation of \$10.00. There will be coffee mugs available at the General Membership Meeting on November 18th.

We now have 11 centennial members, the growth rate is very slow. Our goal would be to have at least 2 members in each of the States. At least 1 member in each of the ARRL sections and at least 1 member in 100 countries. This will make some of radio sport events planned very exciting. Pass the word around, we need to get more members before 2016 so that our activities will be well represented.

Our 100th Anniversary banquet will be held at the Trump Country Club in Pine Hill, NJ on Saturday July 30th, 2016. So mark your calendar.

Work has begun with the SJRA QSO Party, help is needed to administrate and operate. Also, discussions of the SJRA large area special event.

We still need a lot of money to achieve our goals and objectives. Our anniversary is only 216 days away.

With that said, Joe, KC2TN, is selling 100th Anniversary clothing and hats. In addition he has patches. Contact Joe so you can have the *New SJRA Look*.

(Continued on page 10)

Estate Items of W2IJP For Sale

Below is a list of items available from the estate of Ben Heady, W2IJP. These Items have been checked as working by Joe, KC2TN, and Ted, W2TAG, but there are no guarantees as to their operability. The items are being sold together for one price and must all be picked-up at the same time.

- Yaesu FT-847 All Band (160 M thru 432 MHz), All Mode Transceiver
- Yaesu FL-2100B 1KW HF Amplifier with what appears to be two new US made 572B Tubes. (As tested, the unit's installed tubes appear to be soft as we could only get about 450 watts out of the amplifier but the new tubes should allow for full output.)
- Yaesu FC-20 Automatic Antenna Tuner (HF only)
- Astron RS-35 Power Supply (12 Volts at intermittent maximum 35 Amps output)
- Heathkit SB604 Speaker



These Items are being sold as a unit with an asking price of \$1200 for everything listed above. Checks must be made payable to: Jean Heady and must be presented at the time of ownership transfer.

You may *ONLY* contact:
Ted, W2TAG
Phone: 609-268-8460
Email: ted.w2tag@gmail.com.

(Meeting Minutes from page 3)

Fusion repeater system. It turns out there is much to learn about the Fusion system.

Contests- The K2AA station is set up in K2WB's driveway, ready for November Sweepstakes.

New members- Holden Correia-Fisher, KD2JPV, sponsored by Ken, K2WB. Motion to accept KV2R/N3AVT, passed.

Historian is starting to set up timeline. No report from the club trustee. Club stuff- magnets are in works, some trouble with the blue color, to be adjusted.

Health & Welfare- no known ill members, cards ready to go out.

There was discussion regarding the awards, as usual, few nominations have been received to date. The Amateur of the year will need redesign, as the brass keys are no longer available.

Programs by Rich, W2JAZ- Nov: Tony, N2ATB, on Digital Voice; December 9th, Christmas Party; January 2016, Estate and Club Auction; February, White Elephant Auction; March, W2IRA and NJ2IT on website access.

100th anniversary- 11 Centennial Members. Thanks to all from Ken for participation in Field Day.

Al, N3AVT, and Rick, W2JAZ, made a motion to set the Christmas dinner price at \$15 with the club to pick up any overages. Adjournment at 2130.

Lou, N2HQL, Recording Sec.

Editors Note: Because the December 2015 SJRA Membership Meeting is on the second Wednesday of the month instead of the normal fourth Wednesday, The SJRA Harmonics for December will probably not be available before the meeting.

DXCC COUNTRY/ENTITY REPORT:

According to the AR-Cluster Network for the week of Sunday, 1st/November, through Sunday, 8th/November there were 199 countries active. Countries available: 3A, 3B8, 3B9, 3D2, 3DA, 3W, 4J, 4L, 4O, 4S, 4U1I, 4W, 4X, 5B, 5R, 5T, 5Z, 6Y, 7Q, 7X, 8P, 8Q, 9A, 9G, 9H, 9J, 9K, 9M2, 9M6, 9Q, 9V, 9Y, A3, A4, A5, A6, A7, A9, AP, BV, BY, C3, C5, C9, CE, CE9, CM, CN, CP, CT, CT3, CU, CX, D2, DL, DU, E5/s, E6, E7, EA, EA6, EA8, EA9, EI, EK, EL, EP, ER, ES, EU, EX, EZ, F, FG, FK, FM, FP, FR, FS, FW, FY, G, GD, GI, GJ, GM, GU, GW, HA, HB, HB0, HC, HH, HI, HK, HK0/a, HL, HP, HR, HS, HZ, I, IS, J3, J6, JA, JD/o, JT, JY, K, KG4, KH2, KH6, KL, KP2, KP4, LA, LU, LX, LY, LZ, OA, OD, OE, OH,

(Continued on page 10)

Test Session Report for: October 14, 2015

The SJRA would like to congratulate the following on their recent achievements:

Henry Bucci
8321 Harrowgate Dr.
Pennsauken, NJ 08109
Earned his Tech

Joseph Stevenson Jr.
212 Crystal Lake Ave.
Audubon, NJ 08106
Earned his Tech

	Tech	General	Extra	Total
To Date	92	38	20	150

(Monthly Puzzle from page 1)

I'm not sure what the target market is for this product. It's certainly not amateur radio operators, who expect a lot more (in terms of both functionality and "fun") for their money. Nor is it the "Maker" folks, who want something more challenging than an AM radio. I think that if I took this to show off at the local Ann Arbor Maker group, they'd laugh me out of the place.

I really hope that they have something better up their sleeves. A strong Heathkit would be good for the Maker movement and for ham radio.



When not thinking about what kit to build next, Dan, KB6NU, operates CW on the HF bands (mostly 40m and 30m). His #1-rated amateur radio blog can be found at KB6NU.Com, and you can e-mail questions, comments, or complaints to cwgeek at kb6nu dot com.

(Monthly Puzzle from page 6)

A constant voltage source is connected across this circuit and 20.63 Volts is measured across the 33k resistor. What amount of power is consumed by this circuit?

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

(Presidents Message from page 7)

Don't forget that the meeting this month is on the **Third** Wednesday (November 18th) this month.

(Presidents Message from page 7)

Mary and Richard (KV2M and KV2R) has donated the 6 inch diameter magnetic logos from your car. One can be yours for a \$5.00 donation to the club.

The Web Team needs help with content for our history time line. Please contact Rich, KV2R, if you would like to help.

There is still a lot to do and we need your help. Please contact me if you are interested in helping with the 100th.

Items For Sale

**(New Lower Price)*



Mint Alinco DX-SR8T Transceiver with DM-330MVT Power Supply, USB Cable and 20m Dipole using a W2AU balun with coax and a W2FMI UNUN Transformer, **\$400**. Contact John, W2HUV, at (856) 374-3696.

(DXCC Country Listing from page 9)

OH0, OK, OM, ON, OX, OY, OZ, P4, PA, PJ4, PJ5, PY, PY0F, S0, S2, S5, SM, SP, SU, SV, SV5, SV9, T7, TA, TF, TG, TI, TK, TR, TT, TU, TY, TZ, UA, UA2, UA9, UK, UN, UR, V3, V4, V5, V6, V7, V8, VE, VK, VP2E, VP2M, VP2V, VP8, VP8/h, VP9, VR, VU, XE, XT, XW, YB, YJ, YL, YN, YO, YU, YV, Z3, ZA, ZB, ZD7, ZD8, ZF, ZL, ZP, ZS

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

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 \$20 (*New Lower Price*, 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 *at* SJRA *dot* org. A calendar and more information can be found on the SJRA web site.

***Please Note: The test session for December will be held on *December 16* to accommodate the SJRA Christmas Party.**

November Meeting:**Third Wednesday, November 18, 2015**

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 November:

Tony, N2ATB, on digital voice

SJRA Member December Birthdays

Charles Bell, N2JID; Barbara Bell, KC2YJD; Patrick Doyle, KD2P; Edward Fletcher, N2ZPR; Ray Golley, N3RG; Tom Gorman, KE2ES; Dara Herman, KC2THQ; David Soll, KC2YJI.

Health and Welfare Co-chairpersons: Roy, WB2EOD, and Dara, KC2THQ

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

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

First Class Mail

South Jersey Radio Association
PO Box 1026
Haddonfield, NJ 08033

