



HARMONICS

1916

South Jersey Radio Association

2015



Kids are *Not* the Future of Ham Radio

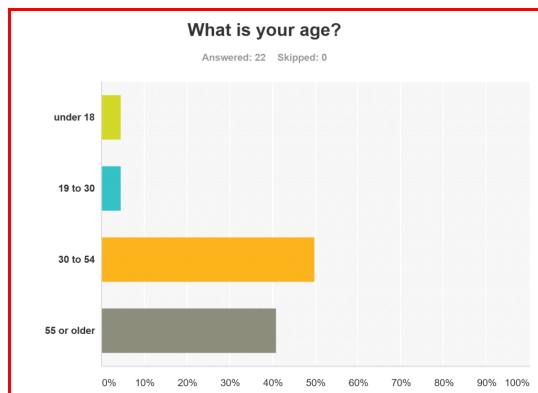
By Bob Witte, K0NR

You've heard it a million times: our kids are the future. That statement gets applied to almost everything, including amateur radio. How can you argue with an obvious fact like that?

But I am starting to think it is incorrect.

We've had really good success on creating new hams of all ages in our Technician License Class (at the Tri-Lakes Monument Radio Association). We've been doing this for a while now and I think I am seeing a pattern emerge. We've been able to attract middle schoolers to the class and help them get their ham radio license. I've talked to many of them on the air. They've helped out with public service events. They seem to have fun playing with radios.

Then this thing called high school happens. The high school phase in the US is filled with tons of stuff to do: studying, homework, AP classes, science competitions, sports, dating, movies, driving and after school jobs. Way too much stuff. Ham radio starts to take a backseat to these normal high school activities. Then we don't see the kids at the radio club meetings or chatting on the local repeater because they are busy doing other things. Have we lost them forever? Not sure.



High school is often followed by college, which has its own set of challenges: a totally new environment, away from home, a new set of people, new studies, etc. There might be a ham radio club on campus but maybe not. If a kid is not off to college they are (hopefully) out doing something to establish themselves in this world. Eventually they emerge on the other side, get a job, get themselves established, sometimes with a spouse and maybe a kid or two. By this time they are 25 to 30 years old, depending on the individual.

I recently posted about the demographics of our students in the Tech License Class (<http://www.k0nr.com/wordpress/2015/10/where-are-the-new-technicians-coming-from/>). The chart above shows the age distribution of our students from our most recent class. Hmmm, clearly

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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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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, January 11, 2016. 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 Minutes November 18, 2015

The meeting, held at the Gibson House in Marlton, NJ, was opened at 1935 by Ken, K2WB, who welcomed all, and asked what they planned to do for the November Sweepstakes.

Lou, N2HQL/W2HJG(?) made a motion to accept the minutes of the October meeting as printed, motion passed. Ray, N3RG, made the treasurers report, accepted on a motion by W2MC/WB2EOD.

New member- Holden J Correia-Fisher age 14 was introduced. Health & Welfare- No known ill members, birthday cards ready to go out.

Programs: tonight- Tony, N2ATB, to speak on digital voice modes: December-Christmas Party: January- Estate Auction: February, White Elephant and Member Auction: March- presentation by Web team.

Repeaters are working, new fusion repeaters are on order, no delivery scheduled as yet.

Club stuff- Still time to order for Christmas.

Nets- by WY2J- They are doing reasonably well, attendance seems to hinge on what football teams are playing.

VE Team Two tested last month, 150 total tested so far.

Web team- Working on SJRA timeline.

Harmonics- Standard deadline, not available for the Christmas Party.

Contests- ARRL 10 Meters 12/11; North American QSO Party (CW) 1/9; North American QSO party 1/16: ARRL January VHF Contest 1/22-23. For NJ QSO party, K2AA was set up in all 9 counties in the section (full set-up/takedown. Joe, KC2TN and Stephen, KZ2I (North Carolina) contacted in all counties.

100th Anniversary- Four more Centennial members. Coffee cups still available. Ken presented a plaque of "Hands Across the Seas" presented by our sister club, the Limerick Radio Club (Ireland).

No old or new business. Break at 2013 until 2026 when the program was presented.

Board of Directors Meeting Minutes December 2, 2015

Opened at 1931 by Ken, K2WB (Gibson House).

Minutes of the November meeting were approved as printed. Motion N2HQL/W2MC. Ray, N3RG, gave a treasurers report, accepted on motion by W2MC/W2JAZ. Ken, K2WB, showed as sample of the new badge with the 100th Anniversary logo. N3RG /N3AVT made a motion that all members receive a new badge. Motion passed.

Corresponding Secretary AC2FO reported receiving an e-mail from a test site, asking how SJRA supplies the FCC tests for free. The message was forwarded to Al, N3AVT, to explain the affiliation to Laurel Amateur Radio Club.

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HAM TECH

Vol 6 No. 12 by John - WY2J

wy2j@arrl dot net

Giving Ham Radio a Voice

Part 3 of 3: NBFM - A Fix for TVI

Introduction - The start of WW-2 took both ham radio and the largely experimental B&W television that operated in a handful of east coast cities off of the air at the end of 1941. In 1946 with the war over the hams returned to the air with their 1930's technology CW and AM rigs. TV returned in late 1946 also but with significant technology improvements over where it was in 1941. Development was concentrated within RCA and they kept development going throughout the war with some of it funded by the government. Dr. V. K. Zworykin at the new RCA Labs in Princeton, NJ had developed the higher resolution and much more light sensitive image orthicon tube. VHF power tubes developed at RCA Lancaster, PA for WW-2 radar went into the new TV transmitters at frequencies up to 216 MHz. David Sarnoff, RCA's chairman, wanted a rapid deployment of TV in the US so he had all the critical pieces designed and well patented by war end. This included the 630TS receiver with a 10 inch CRT that yielded a 6 1/2 x 8 1/2 inch rectangular picture roughly the size of an iPad today. In a table top cabinet it would sell for \$375 in 1948 money, roughly \$5,000 today. RCA called all the radio manufacturers to Princeton in 1946 to demonstrate the TV system and offer them a license on the patent bundle to build and sell the 630TS receiver in their cabinet with their logo. RCA would build the balance of the equipment and NBC would supply the network. It was like a deal to print money. Everybody would get rich. In January 1947 there were 17 TV stations and 16,476 receivers in the country.

Five years later we had over 200 VHF stations, had run out of channels and had sold 15,000,000 receivers.

A Ham's Nightmare - But there was a flaw in the system. Nobody knew how incompatible this receiver was with the ham next door running 100 watts AM in the HF bands with his 1930's technology. Even worse was, how well the 630TS receiver would pick up hams operating in the planned 15 meter band with an IF video carrier at 21.25 MHz. The balance of this paper discusses the technical problem and one of the new modes, Narrow Band FM, that was FCC approved for HF and sold as a fix for TVI.

Channels - At the end of WW-2 Sarnoff had another show stopper problem, he didn't have enough spectrum for TV. Before February 7, 1946 there were only 5 channels or 30 MHz of allocated spectrum for TV. Included in the 48 MHz spanning the 42 to 90 MHz TV band was the FM band, the 5 meter ham band and spectrum for Aircraft Navigation. On February 7, 1946 the FCC revised the spectrum allocation giving Sarnoff 13 channels, 6 in the low band and 7 in a new high band of 174 to 216 MHz. Channel 1 was moved to 44 to 50 Mhz but the FCC refused to issue licenses for this channel because they knew the 21 MHz receiver IF would never last once they opened the 15 meter ham band. They were reserving the 44 to 50 MHz spectrum for the new IF. The 5 meter band became 6 meters at 50 to 54 MHz and channel 2 moved down to 54 to 60 MHz encompassing the full 2nd harmonic of 10 meters and the 4th of 20 meters. This made channel 2 the worst channel for harmonic TVI.

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(Ham Tech from page 4)

Sensitivity to TVI - The closer an interfering signal gets to the video carrier the worse the picture distortion. In addition there is a narrow band surrounding the sound carrier that suppresses the FM sound. Figure 1 shows the interference sensitivity graphically.

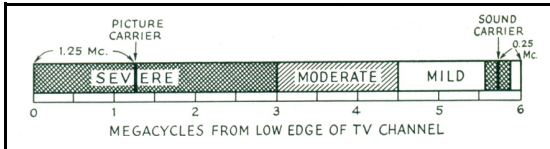


Figure 1, Interference Sensitivity

Video Interference vs Modulation - Figures 2 and 3 show the type and amount of video distortion with CW or NBFM and AM modulation on the 2nd harmonic of 10 meters on channel 2.

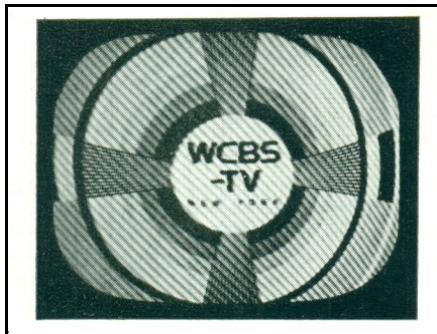


Figure 2, 29 MHz CW/NBFM on Channel 2

Note that CW and NBFM modulation have far less distortion of the picture compared with AM. The video channel of B&W TV used AM modulation and the pattern will change with the operator's voice. These pictures form the argument for switching from AM to NBFM to alleviate TVI in the early days of B&W television.

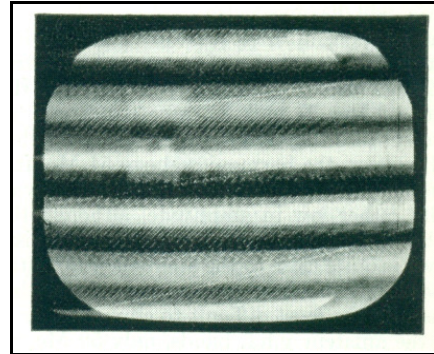


Figure 3, 29 MHz AM on Channel 2

NBFM vs AM Effectiveness - With AM the carrier is the measurement stick for power but the power in the two modulation sidebands determines the signal's punch. For 100 percent modulation the two sidebands are each 50 percent of the carrier amplitude or 25 percent of the power. Thus the total power in the two sidebands is 50 percent of the carrier power. The sidebands of an FM signal are shown in Figure 4 .

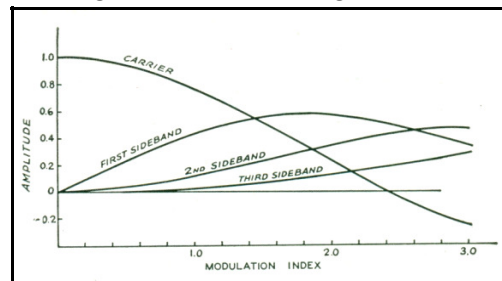


Figure 4, Carrier and Sidebands for an FM Signal as a function of Modulation Index.

To make an FM signal that resembles an AM one in terms of spectrum bandwidth you have to keep the modulation index below about 0.6 which will keep the 2nd order sidebands down by at least 20 dB. This way the FM carrier and sidebands will stay within the accepted 6 KHz bandwidth of an

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(Ham Tech from page 5)

AM voice modulated signal. However the amplitude of the 1st sideband is about 6 dB down relative to the AM sidebands. Your 100 watt NBFM transmitter now behaves like a 25 watt AM one.

And this assumes you have a well designed FM discriminator following the 6 KHz bandwidth receiver IF filter. This never happened during the life of HF NBFM in the early 1950's. None of the receiver manufacturers ever included this rather simple 1 tube, 1 double tuned circuit and a few resistors and capacitors into their receivers. Your author never found a construction article for the discriminator in QST or the ARRL Handbook in the early 50's so he used the method of the day which was to tune your receiver off frequency so the carrier was about 6 to 10 dB down the filter skirt and the NBFM would demodulate with your AM detector. Of course a 100 watt transmitter now sounded like a QRP rig.

Later in life I found the technical description of the Foster Seeley FM discriminator in a 1937 IRE Proceedings. Information didn't flow well in the 1950's with no Internet. NBFM died out rather rapidly and other fixes like harmonic and line filtering and shielding were incorporated into ham transmitters and TV sets to solve a rather messy problem. But NBFM wasn't the answer even if Collins incorporated into their luxury KW-1 transmitter shown in last month's HAM TECH

Next Month - Solar activity will be lower in the next few years so hams will migrate to the lower frequency bands of 160, 80 and 40 meters. A class of receive only antennas can be effective on these bands. We start next month with a look at the 95 year old Beverage antenna.

President's Message

Ken – K2WB

Next year is only weeks away. Time really does fly when you are having fun. In June the SJRA will be entering its 100th year! Members can start signing their call sign with a /100 starting January 1st, 2016

This is the first time the Christmas Party took place this early in December. It was nice to see everyone, the conversation and food were excellent! Congratulations to all of the award winners.

I want to thank all of the committee chairs and their staff for doing a great job throughout the year. The SJRA does not run itself and it takes people to run the club. Make it a point to thank someone or better yet offer to help.

Please check your email and Harmonics for your membership renewal. It is important that all information is updated so that we can make corrections to our database. This will insure that Harmonics and other important club information will continue to go you.

Congratulations to all that participated in Field Day 2015. The SJRA took 4th Place in the 6A category. It took a lot of hard work, but the result was well worth the effort. Field Day 2016 will be here before we know it, let me know if you want to help.

The SJRA email list has been running for a couple of years. This 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

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100th Anniversary Happenings

Ken – K2WB/100

So far the 100th anniversary committee has had 14 meetings (more to come). Just to keep everyone up to date here is where we are.

Over 75 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 January 27th.

We now have 16 centennial members, The SJRA is now represented on 2 continents, 4 countries (including the USA) and 10 states. 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.

Starting January 1st 2016, SJRA members are encouraged to add /100 to their call signs to commemorate the 100th Anniversary.

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. The SJRA QSO Party will run for the entire month of June.

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Monthly Puzzle

Don – WA2DUE, wa2due at arrl dot net

Last month we posed 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?

Answer: We can write two equations; $AE = 1674$ and $A - E = 23$. Therefore using $A = E + 23$ and substituting we can rewrite the first equation as; $E(E + 23) = 1674$. This results in the quadratic equation $E^2 + 23E - 1674 = 0$. Remembering that the solution of quadratic equations is $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$ which works out in this case the Elmer=31 and therefore the Amateur=54.

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

Answer: Using Ohms law we first determine the current flowing through the circuit. Next, again using Ohms law we compute the voltage drop across the 47k resistor. Adding the two voltage drops we get the total voltage across the circuit which turns out to be 50 Volts. Then the amount of power is derived by multiplying the current and the voltage and the value found is 30 milliwatts.

Art, N2CPR submitted his solution to one of the above puzzles. Thank you Art.

For December let us work on these problems:

In a recent contest a local radio ama-

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The 2015 SJRA Award Winners are shown above, they are (from left to right):

The Harry Densham Amateur of the Year Award was presented to Burton Sampley, NJ2IT.

VE Team Award, recognizing special service to the VE team was presented to Lou Priestley, N2HQL.

President's Award for Outstanding Teenager was presented to Robert Beyer KD2AWE

Miles Brown Technical Achievement Award was presented to Robert Beyer KE2D

Gordon Kressel Cumulative Service Award was presented to Joe Fisher KC2TN

President's Youth Awards (Not Shown) were presented to Robert Beyer, KD2AWE; Holden Correia-Fisher, KD2JPV; and Zach Dean

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

Email Ted, W2TAG, with your listing, [ted.w2tag at gmail dot com](mailto:ted.w2tag@gmail.com)

Items for Sale

- ◆ Kenwood TS570S Transceiver with power cord, MC 50 Mic. and Manual. \$650.00
- ◆ Ten-Tec Century Model 570 with Keyer and Manual. \$100.00 or B/O
- ◆ ICOM IC-02A VHF Handheld with Manual and many extras, \$100.00 or B/O
- ◆ Yaesu FT-7 QRP Transceiver with Mic. and Manual; needs work. B/O
- ◆ MFJ 949E Antenna Tuner with Manual. \$75.00 or B/O
- ◆ Kenwood SW2100 SWR/Power Meter with Manual. \$50.00 or B/O
- ◆ Kenwood KPF-7 Power Supply \$50.00 or B/O
- ◆ Astron RS7A Power Supply. \$50.00 or B/O
- ◆ ISO Loop Antenna with Manual, needs new Control Cable. B/O
- ◆ Hy-Power 160 Meter Off Center Fed Antenna, covers 6-10-12-17-20-40-80-160 , Never Installed, paid \$230.00 asking \$150.00
- ◆ TV Antenna, was in my attic for years, never used, good for VHF UHF Antenna parts. Just pick-up or it goes in the trash.

*All items are one owner and non-smoking.

John Mulvey, N2ADE
609-953-0888

(Meeting Minutes from page 3)

VE AI, N3AVT, reported a new total of 152 people tested. He also has replaced the test booklets that were marked in by those tested. He reported an internet connection is scheduled for installation soon.

Rich, KV2R/Jon, W2MC, Jon made a motion that the Corresponding Secretary send an "Official" thank-you to the Limerick Club.

All repeaters are reported as working.

Contests- W2DJY is collecting a list of submitted logs to honor those competing in club contests. K2AA in November sweeps- missed a sweep by 1 in the CW portion but did complete a sweep in the SSB portion.

Historian: Web team on verge of releasing timeline. They would like to enter a few more pictures but will release without them and insert them as available.

Web team- IRA, W2IRA- new features are or will soon be available. Trustee- No OO reports from sweepstakes. Club stuff- last minutes for Christmas availability. Health & welfare- cards ready. Awards committee is ready. No change to programs (see above).

100th Anniversary- Five new prospects: Pete Kobak, K0BAK; James Fisher, KC3BRA; both from PA., Matthew Widup, KC9UDX, from WI; Rich Brown, K3LL, from TX; and David Hamilton, AF0H, from AZ. All were accepted, motion N2HQL/W2JAZ. Field day coming, no action so far.

Old business- Christmas party set up, Dessert will be a cake with the 100th LOGO.

No new business- meeting adjourned.
Lou, N2HQL, Recording Sec.

(Kids Not The Future page 1)

most of our students are 30 or older. (Sorry, we have not collected age data with finer resolution.) This particular class is light on the under 18 crowd...sometimes we have a clump of kids in the mix.

For whatever reason, it seems that most people find themselves in a situation as an adult that causes them to say "I want to get my ham radio license." When asked why they want to get their ham license, the top response is always emergency/disaster communications, followed by backcountry communications, pursuing electronics as a hobby, and learning about radio communications. I suspect that starting to be established in a community and having some disposable income also play a role.

My hypothesis is that the most effective way of growing a vibrant ham radio community is to target adults ages 25 to 40.

This age range is more equipped and ready to be ham radio operators and are still young enough that they will be around for a while. Of course, we still want to work with all age groups, including kids and retirees. We've all seen very young hams get the bug for ham radio early and carry it throughout their life. And we also see plenty of older folks get interested in the hobby as they approach or enter retirement. We don't want to miss out on either of those groups.

So that's my read on the situation. I've got some data to support my theory but I can't really prove it. What do you think? What are you seeing in your ham radio community?



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(100th Anniversary Happenings from page 7)

We still need a lot of money to achieve our goals and objectives. Our anniversary is only 180 days away.

With that said, Joe, KC2TN, is selling 100th Anniversary clothing, hats and patches. Contact Joe should you want to have the *New SJRA Look*.

The Board of Directors approved getting all SJRA members new badges with the new logo.

The Web Team needs help with content for our history time line. Please contact Rich, KV2M, to volunteer.

There is still a lot to do and we need your help. Please contact me if you are interested in helping with the 100th. If you like to help out at the last minute now is a good time!

(Monthly Puzzle from page 7)

teur had a total of 195 contacts with the following countries: France, Germany, Spain and Italy. He worked twice as many French stations than Italian ones; 23 more German than French ones; and one third as many Spanish than German ones. How many contacts were made with each individual country?

What is the number when doubled is greater than its half by 66?

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

(Kids Not The Future from page 9)

Bob Witte, K0NR, blogs about amateur radio at K0NR.Com. You can find this post at <http://www.k0nr.com/wordpress/2015/11/kids-not-the-future/>. You can e-mail him at: bob at k0nr dot com. He is also on Twitter: @K0NR.

(President's Message from page 6)

address you will be receiving an email from sjra-members-resquest@mailman.qth.net inviting you to join the list or you can join 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 SJRA members automatically.

The Web Team did a quick demonstration of the new history time line on the webpage www.sjra.org. It needs more content and information. If you have photos or content please help the Web Team by being a contributor.

In addition, we have several members of the SJRA that would like to come to the meetings but can't drive in the evenings. We needs rides from Mount Holly. I have one volunteer who can provide a ride from Cinnaminson. Contact me if you are interested in helping SJRA members get to the meeting.

I want to wish everyone and their families a very happy and healthy holiday season.

Until next year!, 73.

Item for Sale

Yaesu FT-1900R 2 meter mobile radio new in the box. This radio puts out 55 watts on high power. The price is \$110.00 local pickup. If interested please contact Tony Canuso, N2ATB at:

fcanuso at comcast dot net

SJRA Jackets, Shirts, Hats

Order NOW - Next order going in soon!



Test Session Report for: December 16, 2015

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

Richard Dayton Jr., KD2FND
17 Estates Dr.
Southampton, NJ 08088
Earned his Extra

Ryan J. Ginter
2091 Harbor DR.
Palmyra, NJ 08065
Earned his Tech

Henry Bucci, KD2JVG
8321 Harrowgate Dr.
Pennsauken, NJ 08109
Earned his Extra

George Simko, WA2WES
29 Melville Ln.
Willingboro, NJ 08046-2910
Upgraded to General

	Tech	General	Extra	Total
To Date	93	39	22	154

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.



Happy Holidays from the SJRA Officers and Board of Directors

December Meeting:

Was the Second Wednesday, December 9, 2015

The meeting commenced promptly at 7:00PM in the first floor Meeting Room of the Gibson House on Main Street, Marlton, NJ 08053. Guests are always welcome.

Program For December:

Annual Christmas Party and Awards Presentation

SJRA Member January Birthdays

Ted Dean, KD2ARD; Joe Fisher, KC2TN; Brian Gross, KD2FJX; Robert Kernish, KD2ADL; Alan Koch, KD2ELE; Jack Mays, WA2HJG; Al Witner III, N3AVT.

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

First Class Mail

South Jersey Radio Association
PO Box 1026
Haddonfield, NJ 08033

