

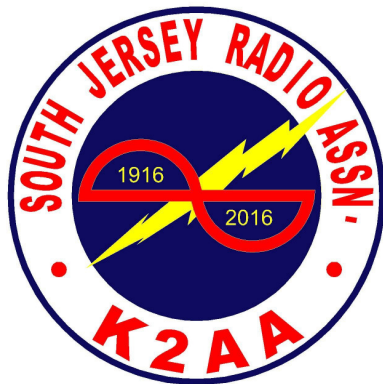


HARMONICS

1916

South Jersey Radio Association

2016



100th Anniversary Happenings

Ken – K2WB/100

So far the 100th anniversary committee has had 18 meetings (more to come). Just to keep everyone up to date here is where we are.

Over 90 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 April 27th.

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

The QSO Party rules are available and have been sent to all members and friends of the SJRA. Pass the word. Help will be needed to administrate and operate. Also,

discussions of the SJRA large area special event. The SJRA QSO Party will run for 10 days in June. We are now looking for operators, sign up early and often, you can do your part of the new SJRA

We still need a lot of money to achieve our goals and objectives. Our anniversary is only 110 days away.

With that said, Joe KC2TN is selling 100th Anniversary clothing and hats, in addition he has 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. Badges are available at the club meetings.

The Web Team needs help with content for our history time line. Please contact Rich KV2M 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. If you like to help out in the last minute now is a good time to help!

Please email me your picture showing your SJRA!! Email them directly to me ken@k2wb.com. Go to our web site to see where the SJRA logo has been.

Also, we are looking for old SJRA photographs. If you can scan them at the highest possible resolution. If you need help we could scan them for you so that they can be included on our website for all to share.

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> ★

Officers

President: Ken Botterbrodt, K2WB
Vice Pres.: Jon Mac Millan, W2MC
Treasurer: Ray Golley, N3RG
Rec. Sec: Lou Priestley, N2HQL
Cor. .Sec: Dennis Cioffi, AC2FO

Directors:

Roy Herman, WB2EOD
 Rich VonLintig, KV2R
 Rick Lawn, W2JAZ
 Ira Weinstein, W2IRA
 Tony Canuso, N2ATB
 Ted Dean, KD2ARD
 Al Witner, N3AVT

Committees:

Historian: Vacant (Please Volunteer)
Membership: Alan Handley, K3WWT
Field Day: Ken Botterbrodt, K2WB
Contests: John Doran, W2FDJ
Repeater: Joe Fisher, KC2TN
Programs: Rick Lawn, W2JAZ
H&W: Roy Herman, WB2EOD; and Dara Herman, KC2THQ
Awards: Rick Lawn, W2JAZ
Hospitality: Jean Priestley, KA2YKN
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, May 9, 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

Meeting Minutes Of March 23, 2016

The meeting was opened at 1932 by Jon, W2MC, at the Gibson House in Marlton New Jersey. We had introductions around due to the presence of several old members who were present that evening. The question of the evening was who got Centennial badges and who were wearing them.

Minutes of the previous meeting were approved as printed in Harmonics, motion by Lou, N2HQL, second by Roy, WB2EOD. There were however, several errors reported in the March Harmonics, i. e., the presentation for the night was not updated on the last page and, secondly, on page 6 a picture of N3AVT indicated that the picture was taken in Alaska but it was actually taken in Hong Kong. *(Editors Note: I always try to make Harmonics as correct as I can but sometimes I make mistakes. I apologize for these errors. W2TAG.)*

Ray, N3RG, gave the treasurers report. We had 84 paid members. Report accepted on a motion by Rich, KV2R, second by Roy, WB2EOD.

Health and Welfare by Roy, WB2EOD - March birthday cards sent out and April cards to be sent.

Programs by Rick, W2JAZ - April, John Hill, W2HUV, Operating Remote Super Stations Over the Web (see [www. remotehamradio.com](http://www.remotehamradio.com)); May, Storm Robotics Team; June, Field Day Preparation; July, Field Day Wrap-up; August, Satellite Radio by Rick, W2JAZ.

VE Testing Team by Al, N3AVT, Our club has helped 160 people received licenses or upgraded so far.

Nets by John, WY2J - The 2M Net is running light but the 10M Net is okay.

Repeater by Joe, KC2TN - He got the node working today. There was a long discussion regarding fusion versus D Star and other digital methods.

Contests - May 27 thru 29 is the CQ CW World Wide WPX; June 9 thru 19 is the SJRA 100th Anniversary QSO Party; June 11 thru 13 is the ARRL June VHF contest. June 25 and 26 is the Field Day 2016.

There was no old or new business.

BOD Meeting Minutes Of April 6, 2016

The meeting was held at the Gibson House but sparsely attended. Missing were Rick, W2JAZ; Ira, W2IRA; Jon, W2MC; Tony, N2ATB; and Roy, WB2EOD. Joe, KC2TN, was an attendee.

The minutes of the March meeting were approved as printed on a motion by Lou, N2HQL/Ted, KD2ARD.

Ray, N3RG, gave the treasurers report, we are up to 90 paid members. The report was approved on a motion by Dennis, AC2FO/Rich, KV2R.

No new members were proposed. The owner of the scanning company who made a large donation to the scanner bill was awarded a Centennial membership on a motion by Al, N3AVT/Rich, KV2R.

(Continued on page 10)

HAM TECH

Vol 7 No. 4 by John - WY2J

wy2j at arrl dot net

The Log Periodic Antenna

Introduction - Bandwidth in Ham antennas has always been secondary to gain and F/B ratio except where multiple single band antennas become mechanically cumbersome like the Christmas tree configuration of single band Yagis on 10, 15 and 20 meters. This problem was solved back in the 1950's with the tri-band trap beam and later with the coupled resonator interleaved parasitic resonator beam pioneered by Force. On lower frequencies wire dipoles or verticals with tuned feed systems met our needs. The first real need for a truly wideband antenna was VHF TV, primarily receivers, which covered two octaves of bandwidth. The second was electronic warfare (radar jamming) pioneered in the post WW-2 era for military defense against hostile radar systems. They required 2 to 3 octaves of bandwidth in the 1 to 10 GHz microwave region. The TV problem was solved with antennas derived from pre WW-2 work on conical structures. The work of D. E. Isbell at the University of Illinois in the early 60's provided the understanding that antenna structures that could be specified only in angles could be inherently wideband. Out of this grew the log periodic spirals, trapezoids' and dipole arrays. The log periodic dipole array is useful in ham applications that require one antenna to cover many bands like 20,17,15,12 and 10 meters or 50 to 1300 MHz at VHF.

Structure of the Log Periodic Dipole Array - The Log Periodic Dipole array resembles the Yagi but operates on entirely different principles. The element lengths are tapered from back to front but in a linear fashion and every element is fed with a phase

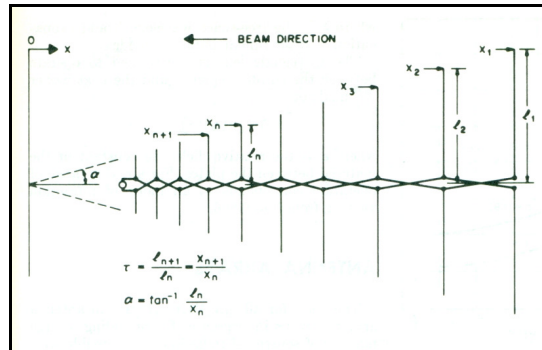


Figure 1, Geometry of a Log Periodic Dipole Array

reversal on alternate elements. Figure 1 shows the geometry of the antenna and the feed method.

The antenna is fed at the front from a balanced source which is usually coax followed by a current balun connected to the antenna's phase reversal transmission line. If the design is sized such that most all of the lowest frequency signal is radiated by the time it reaches the longest element then the transmission line does not need to be terminated. The antenna works by radiating high frequencies from elements near the front feed and low frequencies from the rear elements. Figure 2 shows the current on the elements at two frequencies (14 MHz top and 28 MHz bottom) for an octave bandwidth design.

At 21 MHz the three elements near the center would extract the most current from the transmission line. This design resembles a three element Yagi in terms of forward gain since three elements are doing most of the work regardless of frequency. So this antenna can give you the performance of five

(Continued on page 5)

(Ham Tech from page 4)

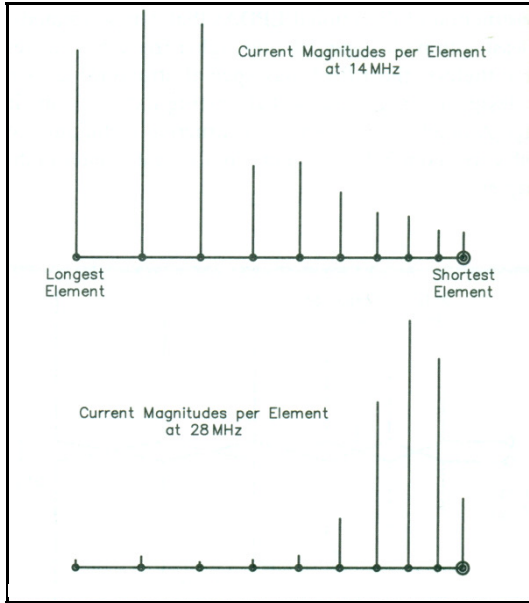


Figure 2, Element Currents at 14 and 28 MHz.

three element Yagi's with just 10 elements since it will also works on 17, 15, and 12 meters.

Design Equations - Two of the most important design equations are listed within Figure 1. The parameter α is the angle of the element tips referenced to the array centerline and is equal to the arctangent of an element half length divided by the distance to the apex of the angle. It is:

$$\alpha = \tan^{-1}(\ell_n/x_n)$$

The parameter τ is equal to the incremental element length decrease and incremental element spacing decrease from back to feed. It is:

$$\tau = \ell_{n+1}/\ell_n = x_{n+1}/x_n$$

A third equation derived from the first two defines the element spacing d divided by total length 2ℓ . It is:

$$\sigma = d_n/2\ell_n = (1-\tau)/(4 \tan \alpha)$$

The optimum value of σ as a function of τ is:

$$\sigma_{opt} = 0.243\tau - 0.051$$

The optimum value of σ is seldom used because it often results in excessively long antennas. As an example with τ of 0.96 and σ of 0.18 a 10 to 20 meter antenna will give a gain of 11 dBi and F/B ratio of 40 dB but will be over 100 feet long. Compromise values are usually used and some are given in Figure 3.

The characteristic impedance and SWR relative to that impedance also vary with α and τ and are shown in Figure 4 for the same range of values as Figure 3. HF 10 to 20 meter antennas become practical for $\tau=0.89$ and $\alpha=15$ degrees. Smaller HF designs could use $\tau = 0.81$ while VHF designs may want to use $\tau = 0.95$.

There is more to designing a good Log Periodic Dipole Array than could be included in one Ham Tech article. The reader

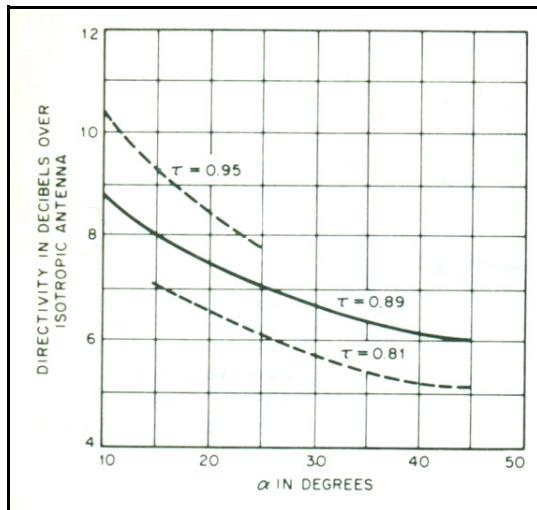


Figure 3, Gain as a Function of α and τ

(Continued on page 10)

President's Message

Ken – K2WB

March Madness is now over, congratulations to the Villanova Wild Cats. Spring Weather brings flowers, rain and thunderstorms. Remember to keep all of your antennas and gear lightening safe.

Field Day will be here before we know it. The club needs your help to succeed. Contact a band captain or myself if you want to help and be part of the success of the SJRA!!

In addition to Field Day the SJRA 100th Year QSO up will be here before we know it. This is a time to show off K2AA/100. We are going to be a bonus point and will be looked for by everyone. Everyone is invited to operate as K2AA/100 from June 10th through June 19th. You can operate from your own station, all that is needed to sign up for a particular time period, band and mode. That is it. Send your log to me so that we can make certain all of the stations contacted can claim the 100 point bonus. The challenge will be to make K2AA/100 available to all. Contact me ASAP to get into the schedule.

This is our chance to show the world what the SJRA is made of please help!

We have 19 Centennial members of the SJRA, giving us representation in 12 states, 3 continents, and 4 countries. Hopefully many more to follow, please tell a friend. As usual I will be bringing coffee cups to the SJRA meeting, one can be yours for a small \$10.00 donation.

We have a member in Mt Holly that would like to come to meetings, but because of their situation is unable to drive in the evenings. Let me know if you can help.

Monthly Puzzle

Don – WA2DUE, wa2due at arrl dot net

Reviewing last months puzzles first:

Find the next term in the series 1,1,2,3,5,8,13,21.

Answer: The next term is 34. Each term is the sum of the two previous terms. This series is called a Fibonacci series, named after Leonardo Fibonacci of Pisa who lived during the years 1170 to 1250. He was a talented mathematician of the times and was credited with the introduction of Arabic numerals as a means of easing calculations.

Find the value of each letter that will solve all eight of the following equations?

$$\begin{aligned} C + A + D + B &= 19; & B + A + B + A &= 28; \\ D + A + A + C &= 15; & D + B + A + B &= 26; \\ C + B + D + D &= 17; & A + A + A + B &= 24; \\ D + B + A + A &= 22; & B + A + C + B &= 25 \end{aligned}$$

Answer: A = 5; B = 9; C = 2 and D = 3. There are many ways to solve this problem. I used the second and sixth equations and solved for A. Using $3A + B = 24$ and $2A + 2B = 28$. By multiplying both sides by of the first and by 3 of the second and subtracting the two equations we eliminate the B get $4A = 20$. Dividing by 4 we find $A = 5$. The remaining unknowns are easily determined.

Mary, KV2M; Ted, W2TAG and Holden, KD2JPV submitted solutions to the puzzles. Thank you all.

This month let us consider the following:

A car battery can deliver 55 Amperes at 12 Volts for one hour but requires 1.3 times more energy to recharge due to its inefficiency. Assume a charging Voltage of

(Continued on page 10)



During the 2016 ARRL DX Contest with Robert, KE2D, (left) and Burton, NJ2IT, (right) Operating K2AA-100



During the 2016 ARRL DX Contest with Roy, WB2EOD, (left) and Dara, KC2THQ, (right) Operating K2AA-100

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)



K2AA-100 on the Queen Mary (Long Beach, CA) and the Associated Radio Amateurs of Long Beach, W6RO. Person holding the K2AA-100 patch is unknown.



SJRA Director, Tony, N2ATB, in Dallas during the First Class CW Operators' Club (FOC) weekend operating the station that was set up in the hospitality room at the hotel, using the call KT5FOC. By way of explanation, the weekend was a social gathering for club members, wives and their guests that included a dinner on Saturday evening (April 9).



Rosemary and Tony, N2ATB, (left to right) at the George W. Bush Presidential Library. This was not part of the FOC activities but a side trip they made while in Dallas.



Three SJRA/100 Members at the 2016 VHF Super Conference, which was held in Sterling VA on the weekend of April 14 thru April 17. Top row (left to right) shows Ted, W2TAG, Joe, KC2TN, and Ray, N3RG. Next to Ray is Dave, W2KV, from Hopewell, NJ and in the front is Greg, KG4KWW, from Mechanicsville, VA.



VHF-UHF contest rover on display at the Super Conference.



F4U-4 Corsair from WW2 at the National Air and Space Museum, which was near the Super Conference

Items for Sale

50 Foot Free Standing Tower (not heavy duty). Tower is on the ground in two pieces that bolt together at the 30 foot level. \$100.

All proceeds from the sale of this item will be donated to SJRA.

Contact Ted, W2TAG
 Tabernacle, NJ
 ted.w2tag at gmail dot com
 (609) 268-8460

(Ham Tech from page 5)

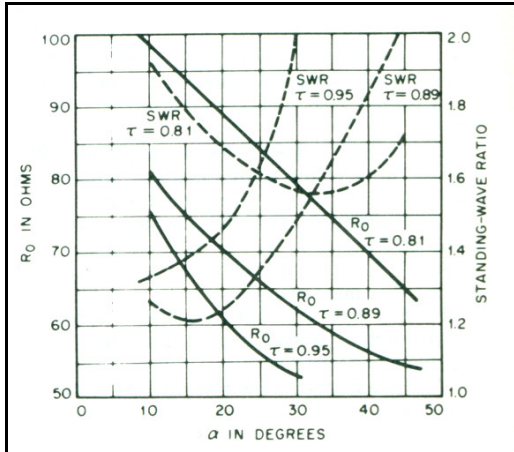


Figure 4, Impedance and SWR as a Function of τ and α for a Log Periodic Dipole Array

is referred to any recent ARRL Antenna Handbook which includes a full chapter for this antenna including a detailed design approach and equations.

Next Month - SJRA is rapidly approaching its 100th anniversary and Ham Tech will start the final three part historical series on the technology development that was required to replace AM with SSB in amateur radio.

(Monthly Puzzle from page 7)

14 Volts is applied, what is the maximum time it will take to fully charge this battery using a current of 7.5 Amperes?

The difference between these two Roman numbers (MMXV and MXMLIX) is the age of one of SJRA's most prominent members. How old is he? And can you guess who I am referring to?

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

(Meeting Minutes from page 3)

Cor. Sec. report by Dennis, AC2FO - A letter was sent to Mary, KV2M, thanking her for her service to the club. An SJRA QSO Party announcement was sent to our ARRL Section Manager.

The board made note of our thanks to the Harmonics staff, the publisher, the distribution team, contributors, and others.

Repeater by Joe, KC2TN - the fusion side of the repeater has become very active. Joe plans to extend the timeout timer to 5 minutes. Ken, K2WB, is donating a clock timer to shut off the digital mode during nets and drive time. This will affect chat rooms and nodes during these times. It was noted that our sister club in Limerick Ireland now has a fusion repeater but it is not connected to the Internet.

History notes: The first three boxes of historical documents have been scanned. The scans will be made available. The hundredth anniversary committee is working on setting up easels to display some of these things at the banquet.

Club trustee reports no OO cards received from the contests.

Club stuff by Joe KC2TN - He has procured another dozen hats and still has some Centennial patches available.

Centennial Committee - Info on the Centennial QSL party has been released. They are working on the menu and other items for the banquet.

There will be a Field Day meeting called in the near future.

There was no old or new business to discuss. It was noted that our friend Ron Pucci is ill and should be sent a card.

Submitted by N2HQL

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.

April Meeting:**Is the Fourth Wednesday, April 27, 2016**

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 April:

John Hill, W2HUV, Operating Remote Super Stations Over the Web
(see www.remotehamradio.com and John's QRZ page for more information).

SJRA Member May Birthdays

John Conroy, KA2KCA; Joseph DeMarco, KC2SGV; Katherine Edwards, KM2KME;
George Fodor, N2GMF; John R. Fogleboch, WY2J; Richard Lawn, W2JAZ; and Robert Petty, KC2HEN.

With deep regret we note the passing of: Connie Duffin, XYL of Joe Duffin, W2ORA (SK), Robert Layton, KB2COB, and Matthew L. Merry, W2MAT.

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

First Class Mail

South Jersey Radio Association
PO Box 1026
Haddonfield, NJ 08033

