



HARMONICS

1916

South Jersey Radio Association

2016



SJRA 100 Year Anniversary QSO Party

Main objectives are to publicize and celebrate SJRA's 100 years while encouraging activity on the bands.

Period: June 10, 2016 00:00 UTC to June 19, 2016 23:59 UTC

Objective: Work as many SJRA members as possible and K2AA/100

Bands: All Amateur radio bands with the exception of 60m, 30m, 17, & 12m, and all modes including repeater contacts will be accepted.

Exchange:

- ◆ SJRA Members: Call/100 + Name
- ◆ Non-SJRA Members: Call + Name

Scoring:

- ◆ Work each station once per band/mode for QRP 5W or less 3 points per QSO, Low Power <150W 2 points per QSO and High Power 1 Point per QSO
- ◆ Multiplier will be the number of unique SJRA members worked. You can work the same SJRA members in other modes and bands. However the SJRA member will only count once as a multiplier. SJRA members are also included in the QSO count.

- ◆ Multiplier for each mode operated regardless of band
- ◆ Bonus 100 QSO Pts for contacting K2AA/100

Mode List (Maximum of 7):

- ◆ CW
- ◆ Phone - SSB/FM/AM
- ◆ Digital - PSK/JT65/RTTY etc.
- ◆ Repeater
- ◆ Satellite
- ◆ EME
- ◆ Modulated Light (Laser)

Logs: Include the following information:

- ◆ Date of QSO
- ◆ Time of QSO
- ◆ Your Call Sign
- ◆ Your Name
- ◆ SJRA Member Call Sign
- ◆ SJRA Member Name
- ◆ Band / Frequency
- ◆ Mode (Be specific: PSK, WSJT, Repeater, CW, SSB, FM etc.)
- ◆ Power Level

Logs to be submitted not later than July 22nd 2016. Send logs to log@k2aa.com. Please put you call sign in the subject line and your mailing address in the email.

Awards: QSL and SJRA LOGO Pin for everyone submitting a log.

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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> ★

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

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

Committees:

Historian: Mary VonLintig, KV2M
Membership: Mary VonLintig, KV2M
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 Stoneking, W2RDS
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, April 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

Membership Meeting 2/24/2016

The meeting was called to order by Ken, K2WB, at 1935, said meeting being held at the Gibson House in Evesham, NJ.

Minutes of the January meeting were approved as printed in Harmonics, motion N2HQL/KE2D.

The Treasurers Report was read by Roy, WB2EOD, as sent by Ray, N3RG. Approval vote on motion by KR2T/W2JAZ.

New Members- No report.

Historian Report by Mark, KD2JPW: He is still reviewing documents for the timeline and the 100th anniversary pamphlet.

Health & Welfare Report: Cards out for March birthdays. Craig, WE2Q, is reported to be suffering from Pneumonia; The daughter of Matt Merry, W2MAT, has passed- cards to be sent.

No Cor. Sec. Report.

Programs: Booked through September. Roy, WB2EOD, reports that March 12 at HRO is Fusion day, for those interested in fusion radios and technology.

VE Team: 157 tested and passed so far (new and upgrades).

Nets by John, WY2J: He reports 2M attendance down since the end of football season.

Contests: ARRL DX weekend of March 4-6. Ken, K2WB, handed out mugs from the last contest. Mugs were initially given out since 1990 for scores submitted as SJRA members.

Repeaters: Joe, KC2TN, reports our fusion repeater are at revision 10D of the software. Units not up to this level must be returned for upgrade.

100th Celebration: July 30th brunch at the Trump golf course. 100th Anniversary QSO party was announced, Details on the web page or as handouts at meetings.

The San Francisco Radio Club has listed similar claims as *oldest*. Ken, K2WB, to contact their President to clarify the claims.

No old or new business. Recess at 2035, before auction.

Board-Of Directors Meeting 3/2/2016

The meeting was called to order at 1935 by Ken, K2WB, at the Gibson House. Minutes of the February meeting were approved as printed in Harmonics, Motion N2HQL/WB2EOD.

Treasurers Report: Not given but five more checks received. New 100th Anniversary badges are available for all paid up members. The problem with PayPal accounts i.e., Dues@sjra.org/Ebay@sjra.org has been resolved. Dues are still to be sent to Ebay@sjra.org.

New members: Frank Longbottom, AA2AW, and Roger Heusner (n/c). Motion to accept W2MC/KV2R, passed.

Repeater committee KC2TN/N2ATB/K2WB: ARCC responded to our reports. We have the WIREX box and radio for one node.

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HAM TECH

Vol 7 No. 3 by John - WY2J

wy2j at arrl dot net

Evolution of the Yagi Antenna

Introduction - One of the most widely used antennas today by Hams is the Yagi end fire array. In HF applications, designs from 2 to 5 elements are practical and up to 30 elements on a 10 wavelength boom are not uncommon at UHF. This antenna was invented by two Japanese university professors in the 1920's, Shintaro Uda and Hidetsugu Yagi. Dr. Uda was the first to publish his description of the antenna in Japanese followed a couple of years later with Dr. Yagi's English language paper. Largely due to the English language paper the antenna is known today as a Yagi although many professional antenna texts call it a Yagi - Uda in recognition of Uda's original contribution. Mathematical analysis of the Yagi antenna is so complex that a theoretical understanding of it didn't occur until 60 years after Uda's and Yagi's first papers with the introduction of computer modeling.

Until the 1980's only the 2 and 3 element yagi had been fully analyzed. All designs were based on maximizing gain which resulted in exceedingly narrow SWR bandwidths. The antenna had a reputation for being fundamentally a very narrow band antenna. It had limited success in the early days of B&W TV for single channel receive only use but died a swift death when color arrived and the antenna distorted the color subcarrier information. Hams started making use of 2 and 3 element designs at HF after WW-2. Most VHF / UHF ham antennas then used stacked dipoles in a broadside array but Miles Brown W2PAU (SK) did design a 5 element Yagi for 2 meters primarily by experiment. He stacked two a wavelength

apart and called it the Twin Five. It was published in the 1955 ARRL Antenna Handbook but with very little performance data.

Early Yagi Antennas - The two element Yagi with the parasitic element resonate (both elements the same length) was analyzed and the summary performance is given in Figure 1.

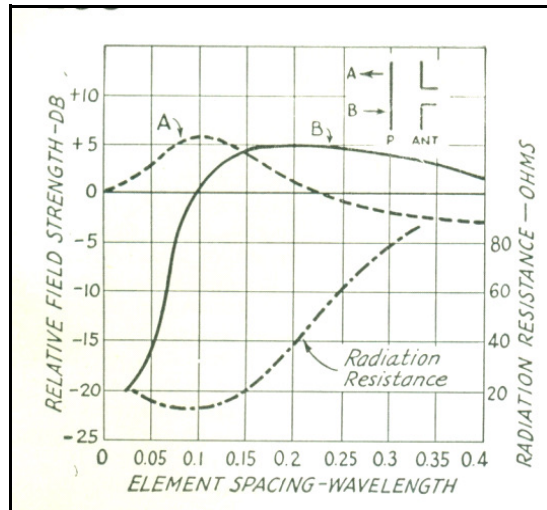


Figure 1, Performance of a Two Element Yagi.

Note that maximum gain of 6 dB is achieved at 0.1λ (wavelength) spacing but the F/B ratio is only 5 dB and the radiation resistance is about 12 ohms resulting in very high Q and very narrow bandwidth design. With a spacing of 0.2λ the parasitic acts as a reflector, gain is 5 dB, F/B is only 4 dB but the radiation resistance is up to the region near a dipole giving the antenna some bandwidth. Early on it was learned that the F/B ratio could be improved significantly by lengthening the reflector and that the gain and bandwidth were preserved. This was a practical two element Yagi used by hams

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(Ham Tech from page 4)

and the early TV industry with a folded dipole driven element.

If two elements works let's try three. Figure 2 shows what can be achieved with three elements, four different reflector spacings and director spacings from 0.1 to 0.45λ . Remember we are only looking at gain the most important factor in the minds of hams and engineers of the day. A peak gain of almost 8.5 dB can be achieved at director spacings of 0.25λ with a reflector at 0.2λ . This chart became the basis for designing three element Yagis in the 1950s, 60s and 70s. Figure 1 and 2 are copied from the 1955 edition of the ARRL Antenna Handbook.

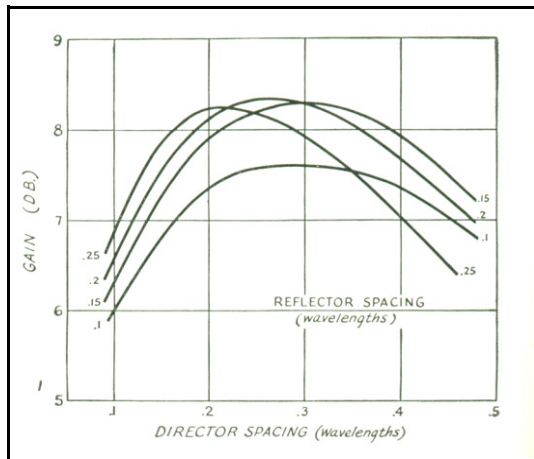


Figure 2, Three Element Yagi Antenna Gain.

Yagi's with more than three elements were empirical designs because of the lack of mathematical modeling that could be solved with a pen, paper and a slide rule. There were still 10 element Yagi's built in the 1950's mostly for TV reception in fringe areas. Some hams scaled the dimensions of a channel 2 Yagi to 6 meters or a channel 7 to 2 meters. Matching networks at the antenna had to be installed to get the SWR down to keep your transmitter happy. But there was very little design data.

Modern Yagi Antenna Design - The availability of the main frame digital computer brought the Yagi antenna into the modern age just like it did for modern filter design. With high speed computation machines you will eventually get analysis software that will get you an optimized design by solving a few hundred thousand possible cases. A few clues based on experimental data also helps. Figure 3 shows the impact on SWR of designing a Yagi for maximum gain. Clearly optimizing the design for maximum gain is the wrong way to go, but we did it for 30 years. We just didn't run enough experiments on enough designs to find out that giving up a little gain can flatten out the SWR curve and give you a reasonable (-20 dB) F/B ratio. As for the long Yagis, 10 elements or more, the TV boys were lucky to get to 10 even with poor performance.

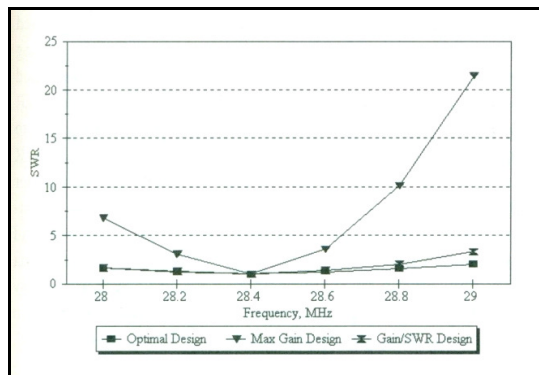


Figure 3, SWR BW for 3 Different Optimizations.

Remember the *Plumbers Delight*, all elements connected to the metal boom for lightning protection. It doesn't impact the design because the voltage is zero at element center. Yes it does and it adds lots of analysis computations so it is gone on long antennas like VHF and UHF. Can you add ele-

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Social Media and Ham Radio

By Dan Romanchik, KB6NU

In the last ten years, there's been an explosion in social media. I've found some to be really great. Others, I haven't found to be to my liking. Here are my opinions on a few of the most popular social media websites:

* **Twitter (twitter.com).** I like Twitter. I have more than 3,000 followers on Twitter, and it's not only helped me sell more books, I've found out about a lot of great projects, and I've met and corresponded with a lot of great hams there. It's a lot of fun. If you have a Twitter account, follow me there. I'm @kb6nu.

* **Facebook (facebook.com).** I have a Facebook account and I even have a page for my study guides. I don't like using Facebook, though, and avoid it when I can.

* **Reddit (reddit.com/r/amateurradio).** Reddit hosts a very active amateur radio forum. What I like about Reddit is that these guys, unlike say the forums on eHam.Net or QRZ.Com are really interested in doing stuff, not just complaining or arguing. A lot of the hams on Reddit, and it's associated IRC channel (talk about retro!), #redditnet, have used my study guides, and apparently, I'm quite popular there.

* **Blab (blab.im).** Blab is an interesting concept. It's kind of like an interactive podcast. You can record the blab sessions and then post them to YouTube or your own website. When I suggested having a regular Blab session to talk about ham radio topics to my blog readers, they weren't very enthusiastic about it. Even so, I think that I'm just going to do it. Sometimes you just gotta go with your gut, and my gut says this could be fun and eventually popular. Blab is inte-

grated with Twitter, so if you follow me on Twitter, you'll find out when I'm blabbing.

The biggest problem with participating on these social networks, of course, is that it takes a lot of time, time that could be used for building stuff or getting on the air. Even so, I would say that, overall, using them has certainly increased my enjoyment of amateur radio and has connected me to people that I probably would not have connected with otherwise.

What do you think? What social media accounts do you have? Which do you prefer? What have they done for you?

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When he's not blabbing or tweeting, KB6NU likes to work CW, build stuff, and teach ham radio classes. He's also a prolific blogger (www.kb6nu.com) and the author of the "No Nonsense" amateur radio license study guides (www.kb6nu.com/study-guides). If you have any comments, questions, compliments, or complaints, email him at cwgeek at kb6nu dot com.



AI N3AVT in Alaska with K2AA-100

(100 Year Anniversary QSO Party from page 1)

Non-Members:

- ◆ Highest overall score will receive a plaque and a 1 year honorary SJRA Membership
- ◆ Top 10 Scores will receive a special certificate
- ◆ Station contacting the most SJRA members will receive a plaque
- ◆ Highest Score in each mode will receive a certificate
- ◆ Highest Score in each band will receive a certificate

SJRA-Members:

- ◆ Highest overall score will receive a plaque and a 1 year free SJRA Membership
- ◆ Top 10 Scores will receive a special certificate
- ◆ SJRA Station contacting the most SJRA members will receive a plaque
- ◆ Highest Score in each mode will receive a certificate
- ◆ Highest Score in each band will receive a certificate

Calls Used:

SJRA Club members will use suffix /100 after their call

Additional:

- ◆ K2AA/100 can be contacted outside of the contest at any time.
- ◆ K2AA/100 will be used during special event weekends visit our website for more information www.sjra.org



Q's	Class	Qmult	Q's Pts
25	QRP	3	75
125	Low Power	2	250
150	High Power	1	150
Total QSO Pts			475
K2AA/100	Bonus +		100
Total QSO Pts			512
SJRA Members Worked		X	32
Score Before Modes			16384
Number Modes, CW, PSK, Phone			3
Final Score			49152

Example on how to calculate your SJRA 100 Year Anniversary QSO Party score



Robert, KE2D In England with K2AA/100

Monthly Puzzle

Don – WA2DUE, wa2due at arrl dot net

First let us review last months puzzles:

Given these three equations: $x+y=37$;
 $x+z=31$; $y+z=36$, solve for x , y , and z .

Answer: We write $x=37-y$; and $x=31-z$;
therefore $(37-y)=(31-z)$. Next, we add
these two sides and get $y-z=6$ but since
 $y+z=36$ we find that $2y=42$ and $y=21$. It is
easy to see that $x=16$ and $z=15$.

In a circuit, a 10 microhenries induc-
tor and a 156 picofarad capacitor are con-
nected in parallel. What is the resonant
frequency of this circuit?

Answer: Using the formula $f=10^6/(2\pi$
 $(LC)^{0.5})$ we get 4660 Kilo Hertz.

For March we present:

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

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

$$C+A+D+B=19;$$

$$B+A+B+A=28;$$

$$D+A+A+C=15;$$

$$D+B+A+B=26;$$

$$C+B+D+D=17;$$

$$A+A+A+B=24;$$

$$D+B+A+A=22;$$

$$B+A+C+B=25$$

Please submit solutions and/or com-
ments to **wa2due at arrl dot net**

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

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

Membership Notice

The following members have re-
newed their SJRA membership for 2016. If
you don't see you call sign in the list, you
have not renewed this year.

N2ADE; WA2BPL; WA2DUE; KC2GNQ;
NJ2IT; WB2LKO; KB2RHI; N2TEV;
N2WYZ; KD2ADL; KC3BRA; N2EAC;
AF0H; WY2J; KV2M; W5RKN; KC2THQ;
N2WZA; N2AK; K3BS; WB2EHY; NC2H;
W2JAZ; W2MC; W2RWN; KC2TN; KF2Y;
KD2ARD; KB2COB; EI8EM; KC2HHX;
KB1JEY; K9MRN, N2SCJ; KC9UDX;
KC2YJL; N2ASU; N2CPR; WB2EOD;
WA2HJG; KC2JJT; WB2NBJ; KB8SFG;
KC2UUG; KA2YKN; N2ATB; KE2D;
KD2EPM; KC2HMG; KD2JPV; K1NGY;
W2SJ; N2VW; K2YNY; N3AVT; AI2D;
W2FDJ; DU1/N6HPX; KD2JPW;
KC2PHM; KC2SNK; WA2VYA; WA3ZKI;
KD2AWE; W0DHB; KD2FMV; N2HQL;
K1JT; K4QE; KA2SZV; K2WB; JA9AA;
K0BAK; KA2DHE; AC2FO; W2HUV;
WC2K; KV2R; KR2T; WB2WEK; K2BL;
KD2DOP; KD2GEO; N2IDW; K3LI N3RG;
W2TAG; K3WWT.

*Not shown on the list are our friends in
the Limerick radio club in Ireland*

What does this mean? After March
31st Harmonics will stop coming to you
via email or direct mail. In short the
March Harmonics will be your last one
and you will be dropped from the email
list, please don't let this happen. If you
sent in your dues and call is not on the list
contact Ray, N3RG, so we can fix it.

Follow the link below to renew:

[http://www.sjra.org/sites/default/
files/2015%20Renewal.pdf](http://www.sjra.org/sites/default/files/2015%20Renewal.pdf)

Contact Ray, N3RG, rgolley at com-
cast dot net with questions or concerns.

100th Anniversary Happenings

Ken – K2WB/100

So far the 100th anniversary committee has had 17 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 March 23rd.

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 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 still need a lot of money to achieve our goals and objectives. Our anniversary is only 150 days away.

With that said, Joe, KC2TN, is selling 100th Anniversary clothing and hats, He also 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.

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President's Message

Ken – K2WB

Our White Elephant sale was very successful. Many thanks to all that donated equipment and those who purchased items.

The 100th Anniversary activities are under way. So far we have been to put K2AA on the air for the January VHF contest and ARRL DX Phone contests. Any contacts made to K2AA will count as the bonus point for the SJRA QSO Party coming up in June.

The rules are out for the SJRA QSO Part, information will be on our Website soon.

Field Day will be here before we know it. Time to start thinking what you can do for the SJRA at field day, we are a team and it requires many talents to keep the SJRA No. 1 in the 6A category. Contact me and be part of the team! This is our only club event and *The SJRA Needs You*.

Ray, N3RG, has been getting a large number of Membership Renewals; we have almost 100 members and hopefully more to come. If you had not done so it is time, otherwise you will not be receiving harmonics after this issue. Please send in your SJRA membership renewal as soon as you can, act now so you don't get missed in the next roster.

Support our nets and check in. It is a good way to meet other members of the club. Check in today.



(Ham Tech from page 5)

ment tapering for wind drag reduction to a non tapered design? No it has a big impact. Do the electrical analysis after the taper design is set in concrete. If tweaking doesn't get you gain what does? Antenna length also known as boom length sets the maximum gain. See Figure 4 .

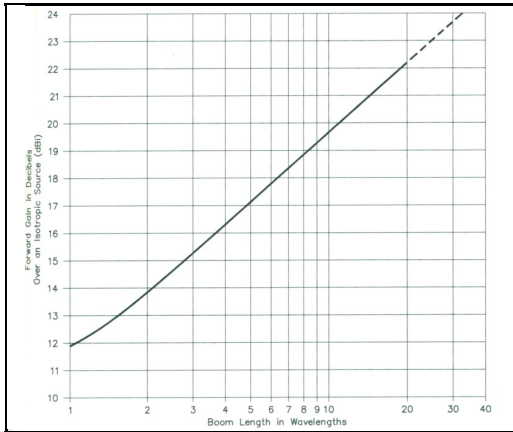


Figure 4, Maximum Gain of a Yagi vs Length.

It is amazing what you can do right once you have the proper tools. A 30 element non-tapered Yagi has a minimum of 870 variables in its design. Try tweaking that with a saw to flatten the SWR curve. The Yagi is a great HF, VHF, and UHF antenna and you can find a wide variety of optimized designs that you can build with performance certainty in any recent ARRL Antenna Handbook. Just don't make changes or ignore tolerances or you will screw it up.

Next Month - One more month on antennas then I promise a change. We explore a very broad band antenna, the Log Periodic.

(100th Anniversary Happenings from page 9)

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 Also, we are looking for old SJRA photographs. We would love to scan them to include them on our website for all to share.

(Meeting Minutes from page 3)

Club Stuff by Joe, KC2TN: Large and small patches still available.

Health & Welfare: Sympathy cards to Duffin family on the death of Connie and to family of Bob Layton, KB2COB, now SK.

Awards /Programs by Rick, W2JAZ: We will have a program on satellite communications at the August meeting.

VE Team: We now have internet access to check licenses and eventually upload test results.

Web Team by Ira, W2IRA: Contacted by Mark Waters regarding info of happenings circa 1916. A security upgrade is due. Will make web presentation at the March meeting.

Field Day: 144 days.

100th Anniversary: The members of Limerick radio club have been added to the e-mail list and are considered Centennial members. Ken is working on the menu for the brunch on July 30th. We again reviewed the 100th anniversary QSO party.

Rec. Sec. Lou, N2HQL

SJRA Jackets, Shirts, Hats

Order NOW - Next order going in soon!



Test Session Report for: February 10, 16, 2016

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

William Andrews
103 Moores Meadow Rd
Tabernacle, NJ 08088
Earned his Tech

Jonathan Walker
16 Shadow Oak Ct.
Mount Laurel, NJ 08054
Earned his Tech

Pibero Djawotho, KC3GRP
7023 Elmwood Ave,
Philadelphia, PA 19142
Earned his General



Tokyo Asakasa Ninja with K2AA/100
in Japan

	Tech	General	Extra	Total
To Date	97	41	22	160

March Meeting:

Is the Fourth Wednesday, March 23, 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 March:

White Elephant Auction and Members Consignment Auction

SJRA Member April Birthdays

Betty Fletcher, KB2WDG; Scott Pycik, KD2EQP; Jackson Snyder, AI2D.

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

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.

First Class Mail

South Jersey Radio Association
PO Box 1026
Haddonfield, NJ 08033

