



# HARMONICS

1916

South Jersey Radio Association

2019



## President's Message

Ken- K2WB

March Madness is now over!

Spring Weather brings flowers, rain and thunderstorms. Remember to keep all your antennas and gear lightening safe.

The conference was a great success! Thank you everyone who help put it together. From all indications our conference was helpful to those who attended.

Not missing a beat several members are putting together a fox hunt. You don't need any hound dogs just a radio and an antenna. Look for more information in Harmonics and on the air.

Before we get into Field Day, our club trailer needs some TLC. There will be a planning WebEx meeting as soon as tax season is over. Look for information on the email reflector. We will need help working on the trailer. It should only take one day.

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!!

At the Last BOD directors meeting it was decided to run a Membership Drive. Kind of like National Public Radio without the membership interruptions. It is easy,

just sponsor two new members to the SJRA and if they get in you would get a free membership in 2020. Our goal is to have 150 members. Contact any Board Member, Membership Committee Member or myself for details. Membership Drive ends on December 31, 2019.

For more than 20 years the SJRA has been holding a radio sport contest within a radio sport contest. If three logs are submitted a particular contest in the same category/class, and the South Jersey Radio Association is listed as the affiliated club with the club sponsor. The winner would get a plaque from the SJRA.

Jon, W2MC is heading up the nominating committee. If you like to help with the operations of the club, please contact him ASAP. He will be revealing the slate at the April meeting. At which time nominations can come from the floor.

Rick, W2JAZ wishes to step down as program & awards chairperson. Please contact me if you are interested in helping.

If you want to come to our meetings and are unable to, please let me know so we can put the word out.

That is all for now,

73's

de Ken K2WB/7

## 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 Rooms 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 SJRA website: [www.sjra.org](http://www.sjra.org) or from Alan Handley, K3WWT, 610-532-5407 Email: [sjra@sjra.org](mailto:sjra@sjra.org) SJRA's web page: [www.sjra.org](http://www.sjra.org)

SJRA VE Team: [ve@sjra.org](mailto:ve@sjra.org) is the SJRA/ARRL VUCC card checker

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

### Officers

**President:** Ken Botterbrodt, K2WB  
**Vice Pres.:** Jon MacMillan, W2MC  
**Treasurer:** Roy Herman, WB2EOD  
**Rec. Sec:** Lou Priestley, N2HQL  
**Cor. Sec:** Dennis Cioffi, AC2FO

### Directors:

Art Arnold, N2CPR  
 Matt Grohgans, N2IDW  
 Rick Lawn, W2JAZ  
 John Doran, W2FDJ  
 Tony Canuso, N2ATB  
 Burton Sampley, NJ2IT  
 Al Witner, N3AVT

### Committees:

**Historian:** Mark Walters, KD2JPW  
**Membership:** Art Arnold, N2CPR and 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:** Matt Grohgans, N2IDW  
**Publicity:** Vacant (Please Volunteer)  
**Picnic:** Vacant (Please Volunteer)  
**Ways & Means:** Roy Herman, WB2EOD  
**Property:** Jon MacMillan, W2MC  
**Web Site:** Ira Weinstein, W2IRA

### Harmonics Staff:

**Publisher/Editor:** Al Ziegler, KD2ST  
**Alternate Editors:** Ted Groke, W2TAG and Jon MacMillan, W2MC  
**Circulation:** Jim Vecchiola, KR2T

\*\*\*\*\*  
 ★ 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/Groups/view/southern-new-jersey> ★  
 ★ \*\*\*\*\*

### LOCAL WEEKLY NETS

Mondays FM Net; Swap Net every 4th Monday	K2AA Repeater, PL: 91.5	145.290 @ 8PM
Fusion on 2 <sup>ND</sup> & 4 <sup>TH</sup> Thurs.	K2AA Repeater, DN mode	145.290 @ 8PM, Fusion
6M SSB on 1 <sup>st</sup> Thurs.		50.150 MHz USB @ 8PM
2M SSB on 3 <sup>RD</sup> Thurs.		144.260 MHz USB @ 8PM

### Harmonics Deadline

Articles submitted for the next Harmonics will be accepted until Monday, May 6, 2019. Email:

[harmonics@sjra.org](mailto:harmonics@sjra.org)

**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 of March 27, 2019

The meeting was opened at 1930 by Ken, K2WB, with a Flag Salute. The minutes of the February meeting were approved as printed in Harmonics, motion N2HQL/W2RLE.

Treasurer's report by Roy, WB2EOD - 108 paid up members, report accepted, motion by WA2JHG/KC2THQ.

Health & Welfare- by Roy, WB2EOD - April Birthday List sent to Harmonics. Cards to go out shortly.

Membership by Art, N2CPR; Reminded all that one member per quarter will get you free dues in 2020.

Harmonics- Al, KD2ST - Need writers/Articles.

Repeaters-Ken: still working. Some motion on move.

Club Stuff- Ken, no outstanding clothing orders.

VE team- Al, N3AVT; Session of 3/27- no passing candidate; 3/31 seven candidates, 4 upgrades to General, One new Technician.

Programs- W2JAZ; March- N2RJ on Flex radio: April- A presentation by Alan Johnston VP of education services of Amsat: May - Storm Robotics; June- Field Day Presentation.

Radiosport- John, W2FDJ: Awards were handed out for SS participation.

Nominating Committee: Jon, W2MC, will announce slate at April meeting, and take nominations from the floor.

Old business- Conference; Almost 50 attendees, a profit was made. Full report to follow.

New Business: none

Break at 1955.

2015- Program started, Ria, N2RJ Hudson Division Director made a presentation regarding Software defined radio systems.

Submitted by Lou Priestley, N2HQL

### Minutes of March 6, 2019 BOD Meeting

The meeting was opened at 1930 by Jon, W2MC. It was held at the Gibson house as usual.

A motion to approve the February board minutes, as promulgated by recording secretary N2HQL was made by N2ATB/WB2EOD, the motion passed.

Roy, WB2EOD, made the treasurer's report, 88 members paid up so far. Motion to accept was made by W2FDJ/W2JAZ, the report was accepted.

Health & welfare by Roy, WB2EOD: no illnesses to report, birthday list sent to Harmonics, cards to go out shortly.

Membership by Art, N2CPR: Dean Gross, N2AWJ; motion to accept by W2JAZ/N3AVT, passed. There was some discussion on awarding a "Free" year's dues at a VE session for examinee #300. Discussion on this subject was tabled.

VE testing: 260 tests passed so far, there will be a change in the system regarding FRN's. This info will be forwarded to the web team.

Programs: March- Ria, N2RJ to discuss Software defined radio systems: April - A presentation by Alan Johnston VP of educa-

*(Continued on page 6)*

## 2019 SJRA CONFERENCE

The SJRA held their first conference on March 24th. We had a great turnout and excellent presentations during this day-long event.



Roy, WB2EOD taking care of the registrations.



Ken, K2WB, Keynote speaker kicking off the Conference.



Holden, KD2JPV presentation on intro to ham radio.



Owen, WA2WTF discussing antennas.



Frank, AA2AW manning the club table.



Tom Abernethy, W3TOM, ARRL Atlantic Division Director.



Tom Preiser, N2XW, ARRL's new Southern NJ Section Manager.



Tom Devine, WB2ALJ, ARRL Section Emergency Coordinator. The ARRL was well represented at the conference. It was nice to meet the ARRL representatives in person and hear the latest news from the ARRL. Thank you all for attending.



The SJRA Elmer team panel wrapped up the conference with some great insight on a variety of topics.

## March 2019 General Meeting

Ria Jairman, N2RJ, ARRL Hudson Division Director, gave a very informative presentation on SDR technology. The presentation included a review of the various SDR equipment available as well as tips for contesting and DXing using SDR. Ria has a YouTube channel at: <https://www.youtube.com/user/rjairam> and a blog at <https://blog.n2rj.com>



## Items for Sale

Cushcraft Model A-3WS 3 element WARC bands beam antenna still in the box never opened. I am asking \$350.00 for it. If interested please contact **Jack Froehlich**, W2AF at **856-809-2965** or **609-352-9696**. The antenna can be picked up at my residence in Atco, N.J. Thank you for your time.

### Antennas for Sale:

Cushcraft A3W with 30m driven element.  
 For WARC bands 30/17/12m: \$150.00  
 Hy-Gain TH6DXX 20/15/10m: \$150.00  
 Hy-Gain 402BA 2 Element 40m Beam: \$200.00

They will be available before the end of June. They will be disassembled and marked for easy reassembly and transportation.

Contact by email: *ken at k2wb dot com*

*(Meeting Minutes Continued from page 3)*

tion services of Amsat: May- SJ Storm robotics team Demo: June- Field Day Wrap.

Harmonics- Al, KD2ST- awaiting word about content for "Conference Edition".

Nominating Committee - Jon, W2MC, Chair- needs nominations. Still checking with sitting members.

Nets- Matt, N2IDW- They're good.

Repeater- Jon, W2MC- they are still operating.

Contests- John, W2FDJ: March 29-31, CQWW WPX SSB: April 14, ARRL Rookie Roundup. He needs to get Certificates for contest winners.

FD- 107 days.

Old Business: Conference- Last minute plans and reviews of documents. Saturday breakfasts- (W2JAZ) they are going well, 16-20 most days. Reminder for upcoming weekend.

New Business- none.

Adjourn @ 2045

Submitted by Lou Priestley, N2HQL.

## Upcoming Regional Hamfests May 2019

May 5th: **Warminster ARC & EPA Section Convention** 7 am to 1pm. At Bucks County Community College- Lower Bucks Campus, 1304 Rte. 413, Bristol, PA. Website: <http://wp.k3dn.org/hamfest>

May 10<sup>th</sup> & 11<sup>th</sup>: **Delaware Valley Historic Radio Club, Antique Radio Meet & Auction** Open 7 AM at Renningers Antiques Market, 740 Noble St, Kutztown, PA. Website: <http://www.dvhrc.com>

## VE Report for March 24, 2019

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

We had no upgrades or new techs earn privileges on our regular session on March 20, 2019.

At the March 24, 2019 SJRA Radio Conference the following have earned new or upgraded licenses.

### Jeffrey J Nalbone, KD2RLE

715 Tutor Lane  
Williamstown, NJ 08094  
Earned his General

### Jonathan M Mueller, KC3NDP

56 Welsh Tract Rd #108  
Newark, DE 19713  
Earned his Tech

### Robin S Smith, KD2RGI

1116 Liberty Bell Dr  
Cherry Hill, NJ 08003  
Earned her General

### Gary S Smith, KD2RGG

1116 Liberty Bell Dr  
Cherry Hill, NJ 08003  
Earned his General

### John W White, KD2RPX

38 Rivendell Rd  
Marmora, NJ 08223  
Earned his General

### Total New or Upgrades to Date

Tech	General	Extra	Total
157	71	37	265

## Radio Sport aka Contests

John, W2FDJ, johnd152 at Verizon dot net

### Member's activities:

ARRL INT DX CW (Feb 15-17)	
Name	Points
John, W2FDJ	153,057
Dom, KD2EPM	2,160
John, W2HUV operating WWA	0

ARRL INT DX SB (Mar 1-3)	
Name	Points
John, W2FDJ	45,900
Dom, KD2EPM	8,100
Joe, K3WJL	4,410
Mark, KD2JPW	1,044

CQ WPX SSB (Mar 29-31)	
Name	Points
Jack, N2VW	316,440
Dom, KD2EPM	33,960
Al, KD2ST	3,397

**Upcoming Contests** - see [arrl.org](http://arrl.org) or [contestcalendar.com](http://contestcalendar.com) for rules and more details.

### Every Tuesday only

**Phone Frey** 10:30PM-11PM. (yes 30 min) (ten weeks -4 times a year)

### Every Wednesday only

**CWops Mini-CWT test** 9 -10AM, 3-4PM, 11-12PM (three one hr. sprints)

### Every Thursday only

**NCCC Sprint** 10:30PM-11PM. (yes 30 min.)

### Every Thursday only

**NCCC RTTY Sprint** 9:45-10:15PM. (30 min.)

**ARRL Rookie Roundup:** 4/14 Sun. 7PM EDT to 11PM. HF + 6m SSB

**222 Mhz Spring Sprint:** 4/16 Tue. 7PM EDT to 11PM 222Mhz; mode not specified.

**432 Mhz Spring Sprint:** 4/24 Wed. 7PM EDT to 11PM 432Mhz; mode not specified

**Microwave Spring Sprint:** 5/4 Sat. 8AM EDT to 2PM; Above 902Mhz; mode not specified.

**50 Mhz Spring Sprint:** 5/11, Sat 7PM EDT to 11PM; 6m – mode not specified

**CQ WW WPX Contest CW:** 5/24-26; Fri 8PM EDT to Sun 8PM; HF - CW


**ARRL June VHF Contest:** 6/8-9, Sat 2PM EDT to Sun 7PM; 50Mhz and up -All modes

**ARRL Kids Day:** 6/15, Sat 2PM EDT to Sat 8PM

**ARRL Field Day:** 6/22-23, Sat 2PM EDT to Sun 5PM; All modes

**10-10 Int Spirit of 76 QSO Party:** 7/1-7, Mon 8PM EDT to Sun 8PM- 10m CW, SSB, PSK31, RTTY, FM, AM

**WORLDWIDE DISTRIBUTION**



**Ken Hartley**  
 Manager  
 N2OHD

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### New Members

The SJRA would like to welcome the following new members to our Club:

- Rich Roehm, KD4RJR
- Robin Smith, KD2RGI
- Gary Smith, KD2RGG
- John Jones, KD2RKA



**2018 ARRL November Sweepstakes participants receiving their pins at the March General Meeting.**

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# PRINTING



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## The Inner Limits

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The MicroChip Development Kit will be referred to as MDK.

This month I am addressing the software needed for the laptop and the MDK. I will approach the software here descriptively.

From a previous article, I addressed a list of the inputs and a description to a limited extent of the outputs of this digital oscilloscope. The inputs tie into the laptop software since it has to collect the inputs and provide most of them to the MDK software. Likewise the display portion mostly ties into the laptop software.

The MDK takes the inputs from the laptop, uses them as the basis of collecting data and then provides this data back to the laptop software, hopefully in a manner for the laptop to easily display. The left side of the window will provide most of the controls that are fed to the Microchip development board. The display will be controlled by a combination of information on the left side of the display and will also control some display actions from the right side of the display where the two-graph type displays of voltage vs. time occurs.

Figure 1 provides the display I currently envision for this digital oscilloscope.

I am initially breaking this project down into 5 stages, not necessarily done in the following order:

1. Hardware design of interface circuitry to make either a voice signal or a sine wave signal compatible with the input levels of the MikroElektronika TMIK024 daughter-board. Assume a maximum peak to peak voltage range of -5 to + 5 v. The daughter-board accepts only positive voltages so I will have to offset the incoming voltage.
2. Laptop SW design of input and signal display.
3. MDK SW design of A/D data collection.
4. Design of software in both the MDK and in the laptop to communicate the appropriate data back and forth for the software on

both the laptop and the MDK.

5. Integration of all of the above followed by final testing.

My approach to software design is to identify the inputs and outputs of each software element. Define the data structures needed in order to implement the software and finally to write the software to implement the software functionality. I will only partially define the data structures here, see actual software that will be available later for this detail.

### Microchip Development Kit Application Software

Overview of software in MDK.

- A. Software to communicate in both directions with the laptop.
- B. Identify the data format to store the digital version of the analog data recorded for each channel. For each of 2 displays, this includes:

Data that comes from the laptop:

1. A reset command and a capture command. The capture command includes items 2-4 below.
2. A 16 bit word representing the lower bound of the voltage.
3. A 16 bit word representing the upper bound of the voltage.
4. The amount of data to be collected. This is either 50 Samples (1000 microseconds of data) for each channel, 500 samples (10 milliseconds of data) for each channel or 1000 samples (20 milliseconds of data) for each channel. This is determined by the selected time scale.
5. The trigger source which is Channel A, Channel B or an External Trigger.
6. The edge (rising or falling) of the trigger used to trigger data collection. The voltage midpoint is the beginning point of the trigger. On a positive/negative voltage range this is 0 volts. On a 0 to 5 volt scale, the voltage is 2.5 volts. There may have to be a change to this trigger point.

*(Continued on page 10)*

(The Inner Limits from page 9)

### MDK generated data to be sent to the laptop:

1. A 1024-word buffer of the digital version of the recorded data stored as 16 bit words (12 bits of which are data the remainder are zeroes). The upper and the lower voltage bounds of the analog input are specified by the laptop data. All 0's represents the lower bound, All 1's represents the upper bounds.

Note: Since computers generally work with multiples of 8 bit bytes typically, we will use a 16 bit location in memory for each 12 bit word. The data actually sent from the MDK to the laptop is the amount requested by the laptop. The start of the recording is at time 0 microseconds. Subsequent samples are taken at 20 microseconds increments for both channels.

Overview of actions by the user of the os-

cilloscope system and some hidden action that I assume will occur.

1. Activate both the laptop software and the Microchip software.
2. Connect the input signals to the development board (possibly through an adapter board that scales and offsets the inputs for the development kit).
3. Enter any inputs to the input screen for the oscilloscope in the window for this that runs on the laptop (the input screen will initially have default values for all the inputs)
4. Activate a screen button on the laptop that says it is time for the oscilloscope to acquire data.
5. The oscilloscope needs a trigger to begin collecting data. Either the oscilloscope will collect data immediately after the user clicks a data capture button on the laptop or the data capture button will wait for an input trigger to occur.

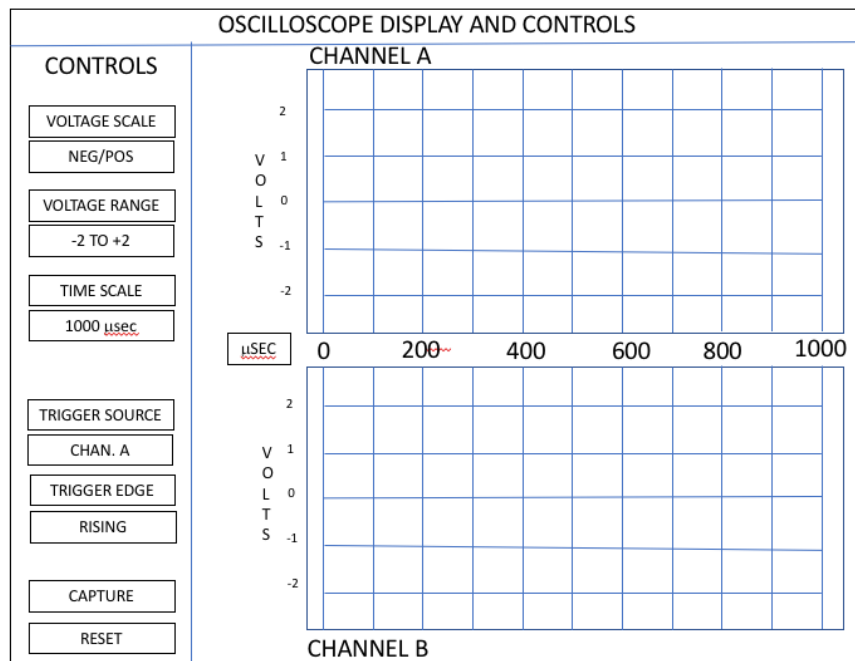


Figure 1

## SJRA Jackets, Shirts, Hats

Order NOW - Next order going in soon!



Spring Jacket is \$51 (S,M,L,XL), Fall Jacket is \$58 (S,M,L,XL),  
 Shirts are \$28 (S,M,L,XL), Hats are \$25 (one size fits all)  
 Name and Call Sign embroidery included....Larger sizes slightly more!  
 Email Joe, KC2TN, with orders or additional info: kc2tn at comcast dot net

### Amateur Radio FCC License Testing

The SJRA sponsors *FREE* Amateur Radio FCC License testing on the third Wednesday of each month, except Nov & Dec. TBD. The location is: New Brooklyn United Methodist Church; 1336 E. Malaga Rd. Williamstown, NJ 08094. Registration is at 7:00 PM and testing begins at 7:30 PM. 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 24, 2019**

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

**Program For April:**

Our program for April is The New AMSAT CubeSat Simulator: A Satellite In Your Hand, Alan Johnston, KU2Y, AMSAT VP for Educational Services.

**SJRA Member May Birthdays**

May Birthdays are: Holden Correia-Fisher, KD2JPV; John Fogleboch, WY2J; Carl Hyde, W2CSH; Rick Lawn, W2JAZ; Robert Petty, KC2HEN and Al Ziegler, KD2ST

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

**May Meeting:****Is the Fourth Wednesday, May 22, 2019.****First Class Mail**

South Jersey Radio Association  
15 Pelham Road  
Marlton, NJ 08053

