



HARMONICS

1916

South Jersey Radio Association

2014



Sundown over the SJRA 40 Meter SSB Field Day Antenna

SJRA's Field Day 2014 With K2AA Is A Success!

Forty-eight participants (27 SJRA members) propelled SJRA to a good showing during the 2014 Field Day demonstration of emergency communication techniques. Perhaps the most important achievement is the fact that the club maintained its expertise for

another year through the traditional mentor-newcomer relationships.

A number of bonus point activities gave up-and-coming SJRA members a chance to learn the secrets of radio success from veterans. This year Rich, W2JAZ, assisted Joe, KC2TN, with the satellite contact by pointing the handheld multi-polarity

(Continued on page 6)

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 at sjra dot org](mailto:sjra@sjra.org) SJRA's web page www.sjra.org
 Mark O'Brien, K2AX, is the SJRA/ARRL VUCC card checker
 Joe Fisher, KC2TN, is the SJRA/ARRL WAS card checker

 ★ **Harmonics** is now available 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:

Kathy Edwards, KM2KME
 Rich VonLintig, KV2R
 Debbie Pullaro, W9QWN
 Ira Weinstein, W2IRA
 Mary VonLintig, KV2M
 Jim Vecchiola, KR2T
 Al Witner, N3AVT

Committees:

Historian: Mary VonLintig, KV2M
Membership: Mary VonLintig, KV2M
Field Day: Ken Botterbrodt, K2WB
Contests: Jon Mac Millan, W2MC
Repeater: Joe Fisher, KC2TN
Programs: Rick Lawn, W2JAZ
H&W: **Vacant (Please Volunteer)**
Awards: Rick Stoneking, W2RDS
Hospitality: Jean Priestley, KA2YKN
Nets: John Fogleboch, WY2J
Publicity: Debbie Pullaro, W9QWN
Picnic: Debbie Pullaro, W9QWN
Ways & Means: Ray Golley, N3RG
Property: Jon Mac Millan, W2MC
Web Site: Ira Weinstein, W2IRA

Harmonics Staff:

Publisher/Editor: Ted Groke, W2TAG
 Alternate Editor: **Vacant (Please Volunteer)**
Circulation: Mary VonLintig, KV2M;
 Jim Vecchiola, KR2T

LOCAL WEEKLY NETS

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

Harmonics Deadline

Articles submitted for the next Harmonics will be accepted until Monday, August 11, 2014. 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

Minutes of Membership Meeting 6/25/2014

The meeting opened at 1932, at the Gibson House in Marlton, N. It was opened by Ken, K2WB. There were introductions around, the question of the night was "Where will you be during Field Day?"

Minutes of the May meeting were approved as printed in Harmonics, Motion by Lou, N2HQL, second by Skip, N2EI.

Ray, N3RG, made the treasurers report, 104 paid up member. Approved, motion by Jon, W2MC, second by Roy, WB2EOD. No new members were reported. Historian showed 1948 Officer and Director list.

Health & Welfare- No report, need new chairperson.

VE team- 5 last session, all passed.

Nets- by John, WY2J, Participation has dropped "like a rock", 10M operation will be suspended until September.

Contests- Field Day this weekend-setup to start Friday.

Repeaters- 145.29 appears to be in need of a new antenna. Our spare has been painted, we will look into whether it can be used, if the paint can be removed. A replacement may be needed. New sites for the .865 repeater are being investigated as to cost of moving and coordination at a new location.

Web team, by Ira, W2IRA- Now located on the new commercial server. It has been unlocked and is ready for new input.

Old business- Jim, N2UAS still needs help for his July "STEM CAMP." Skip, N2EI announced his candidacy for Section Manager.

New- New board members need to be nominated to fill empty seats. Roy, WB2EOD; Ted, KD2ARD; and Rick, W2JAZ were nominated. They all accepted. They were all invited to attend the July board meeting as guests. Nominations were closed- Motion by Jon, W2MC, Second by Joe, KC2TN.

Meeting into recess for Field Day warm up program.

Minutes of Board Meeting 7/2/2014

All were present except Rich, KV2R and Mary, KV2M. None of the prospective members attended. Meeting opened at 1930 by Ken, K2WB, at the Gibson House. Minutes of the June Meeting were approved as printed, Motion by Lou, N2HQL, Second by Dennis, AC2FO. Jon, W2MC, remarked how much he enjoyed the dinner catered by Ken.

No new members. Treasurer, Ray, N3RG reported 105 paid up members. Dennis, AC2FO, reported no normal correspondence, although he did post information about the ARRL colonies contest. Ken, K2WB remarked that SJRA has a Colonies award but it hasn't been awarded for several years. If not already on the awards page, it will be added.

Repeater- new sites still being evaluated.

(Continued on page 10)

HAM TECH

Vol 5 No. 7 by John - WY2J

wy2j at arrl dot net

Widely Used Digital Text Modes

Part 3 of 4: JT-65HF Mode

Introduction - In the last two months we have explored the two most widely used conversational text modes RTTY and PK-31. By conversational I mean you can transmit the full ASCII keyboard with PSK-31 and the capital letter alphabet, 10 numerals and common punctuation with RTTY. In other words you can use it both for contests and DX where the information transmitted is limited or you can carry on a rag chew with your buddy. The JT-65HF mode we will explore in detail is non-conversational because the messages are highly structured like filling in the blanks on a form and limited to the minimum information needed to qualify for a legal contact. So if your interest is just piling up Q's in the log you will love this mode. Its benefit is tremendous sensitivity, you can work the world with 5 watts and a dipole antenna, and there are lots of DX stations on the air using it.

Heritage - JT-65HF is a modification of Joe Taylor's (K1JT) JT-65 software which was designed for Earth Moon Earth (EME) VHF/UHF communication where sensitivity was of paramount importance. John Large (W6CQZ) made modifications to the JT-65 open source software to enhance its performance in the HF environment like processing multiple signals. The HF version is also somewhat more user friendly.

Basic Message Structure - The message content of a legal contact must contain only a call sign, QTH i.e. grid square, signal report,

date and time. This is the content of a JT-65HF structured message. It also allows sending a CQ with call sign and grid square, a free form message of up to 13 characters and spaces and a signoff Morse CW call sign. Call signs with a prefix like VE/WY2J or suffix like WY2J/3 are not allowed. Other things like name, power or antenna have to be tucked into that 13 character free form message.

To give you a feel for the message structure see Figure 1, which is a subset of a JT-65HF screen shot taken by WY2J on 2 July 2011 between 17 hrs 13 min and 16 min UTC. The author was using a 20 M dipole at 15 ft. Note the DX call signs in the exchanges.

UTC	Sync	dB	DT	DF	Exchange
17:16	3	-13	0.2	326	B 20W GP TU 73
17:16	9	-5	-0.1	-3	B CQ N8YOH EM79
17:16	4	-16	2.5	-786	B CQ UT4UF K040
17:15	4	-20	1.4	974	B CQ UA1ZGI KP57
17:15	6	-7	0.1	312	B TU PAUL KY 73
17:15	5	-14	0.9	-293	B CQ DJ6KO JN48
17:15	4	-15	0.5	-484	B VE6DJT KF6H RRR
17:14	4	-14	-0.0	320	K ND4X W4UAT R-18
17:14	6	-21	0.6	54	K 4X1DG CX4CR 73
17:14	7	-11	0.1	-509	B 9J2KK IK5UIM 73
17:14	4	-17	2.2	-791	B CQ UT4UF K040
17:13	3	-9	0.1	307	B W4UAT ND4X -12

Figure 1, JT-65HF Decoded Messages on 14.076 MHz on 2 July 2011 from 17 hrs 13 to 16 min UTC.

Shown are 5 stations calling CQ with received signals of 5 to 20 dB below noise in a 2 KHz bandwidth. Others are in various stages of completing a QSO which takes at least 6 min without free form messages. Each transmission starts on a UTC minute boundary plus 1 second and continues for exactly 46.811 seconds. The balance of that minute is used to decode the received signals. A total

(Continued on page 5)

(Ham Tech from page 4)

of 72 information bits and 306 error correction bits are sent in that 46.811 sec interval giving a 5.25 to 1 signal redundancy stretched over this time interval. This gives the mode extreme robustness against errors in HF QSB.

Timing and Frequency Stability - JT-65HF requires precise synchronization of transmission timing between all stations. This is done by synchronizing the computer clocks to Internet time. Errors should be a fraction of a second. The author has had no difficulty syncing two Windows machines running XP to Verizon FiOS and Comcast. Internet services thru Either Net and WiFi connections. Note the timing errors displayed in Figure 1 DT column. Only UT4UF (lines 3 and 11) has an error over 1 second. Frequency stability tolerances are tight but modern HF rigs with a synthesizer will work well.

QSO Format - This is shown below for structured messages where A & B are the two stations, CS = Call Sign, Grid = 4 character grid square and R & RRR = confirmation.

Minute	XMIT	MESSAGE
1	A	CQ CS(A) GRID(A)
2	B	CS(A) CS(B) GRID(B)
3	A	CS(B) CS(A) SIG(B)
4	B	CS(A) CS(B) R SIG(A)
5	A	CS(B) CS(A) RRR
6	B	CS(A) CS(B) 73

A 13 character free form message is usually sent between 5 and 6 minutes above. The 73 sign off can be omitted if the transmission ends with the call sign sent in CW.

Modulation - JT-65HF uses a frequency shift keying like RTTY but with 64 frequencies rather than the 2 used in RTTY. The message consists of two 28 bit fields for call signs and a 15 bit one for grid squares. The 15 bit field has 368 unused values and the 28 bit field has about 6 million unused. The unused values are used to encode items like CQ. The three fields total 71 bits. One additional bit is added to identify a 13 character free form message giving a total of 72 information bits in a transmission. To this is added 306 error correction bits giving a grand total of 378 which equals 63 times 6. The 6 bit word defines 64 FSK tones in the transmission. Each tone is transmitted sequentially and lasts for 0.37152 seconds. The reciprocal of this number, 2.69 Hz is the approximate information bandwidth of JT-65HF or 28.7 dB below 2 KHz. JT-65HF is known for correctly decoding signals down to about 25 or 26 dB below the noise in a 2 KHz bandwidth. The 2.69 Hz tone BW times 65 values equals 174.85 Hz the approximate spectrum width of JT-65HF.

Besides the signal information and error correction transmitted a synchronization vector made up of 63 additional words at a 65th tone is included giving a total of 126. The product of 126 and 0.37152 seconds gives the transmission time of 46.811 seconds. The sync vector is uniquely encoded to be easily identified from the information and error correction.

Decoding Process - JT-65HF used a very complex error correction technique, which is beyond the mathematical scope of HAM TECH articles. The process effectively transmits the 72 bits of data over five times distributed over 46 seconds to combat QSB and other ionosphere induced errors. The sync

(Continued on page 10)

(SJRA 2014 Field Day A Success from page 1)

2m/432 yagi for the contact. Rich, W2JAZ, also contributed a copy of the W1AW bulletin, which he obtained by his own expertise in digital communications. He or John, WY2J, who also copied the bulletin would be good persons from whom to learn those techniques. Burton, NJ2IT, got an introduction to the National Traffic System (NTS) by assisting Rich, KV2R, with the NTS messages. And those lucky enough to witness Ray's, N3RG, demonstration of coax connector assembly will be well informed the next time they need to place a connector on bare coax. Jon, W2MC, garnered SJRA his usual 100 bonus points for solar power contacts, making those the first contacts for his 80m/15m SSB station. And anyone could have gained valuable experience from Ray, N3RG, Craig, NC2H, Ken, K2WB, Bob, N2SCJ, or Al, N3AVT, as they ran the emergency generators all weekend to win another 600 bonus points. All these skills and more were available to the interested amateur radio operator who participated.

In addition, SJRA earned bonus points from its public location at Savich Field, by recruiting a visit from ARES-served agency (Fire Police and Red Cross) member Chris, and by coaxing much appreciated newspaper coverage from the Burlington County Times. Mary's, KV2M, information display gave visitors an idea of what ham radio is all about, and this year it featured plaques won by late member Miles Brown for radio excellence (1st Place ARRL DX Phone in 1985, 1st Place November Sweepstakes Phone in 1988, and 2nd Place ARRL DX Both CW and Phone in 1989). Ted, KD2ARD, and son Zach earned 40 bonus points at the GOTA station, while the GOTA crew combined for 48 QSOs. Perhaps most important to the transfer of expertise to a new generation

were youth contacts recorded by Cole Hazlett, Zach Dean, Harry Kingsmill, Joe Doyle, and Sam Dutkin. Each of these won 20 points for SJRA in 2014 and maybe someday a member for life. The total of 1710 Field Day bonus points is summarized below.

Category	Points
100 Percent Emergency Power	600
Media Publicity	100
Public Location	100
Public Info Table	100
NTS Msg to Sect Manager	100
Other NTS Messages	20
Satellite Contact	100
Solar Power Contacts	100
W1AW Bulletin Copy	100
Educational Demonstration	100
Site Visit by Elected Official	0
Site Visit by ARES-Served Agency	100
GOTA Bonus Points	40
Youth Contacts	100
Results Submittal by Web	50
Total	1710

Of course, everyone wants to know how many points SJRA earned including QSOs but that has not been compiled yet. Come to the July General Membership Meeting for the big announcement.

GCARC Hamfest

We just firmed up the date for our 2014 Hamfest. It will be held Sunday, September 14 at the 4-H Fairgrounds in Mullica Hill, NJ. Cory, WA3UVV, is our hamfest contact person. Thanks.
73,

Tom, KE2ES
Hamfest Chairperson
www.w2mmd.org

President's Message

Ken – K2WB

When I look at the SJRA membership I see a great group of people with common interest. Some call it "Ham Radio" and others call it "Amateur Radio". We come from many diverse backgrounds both professionally and ethically and yet we still hold true to our hobby and friends. This is the principal ingredient of the continued success of the SJRA. This is something to think about as we move closer to our 100th Anniversary in June 2016.

Field Day 2014 is now a fond memory, much kudos to the band captains and members for their tireless efforts in keeping the club call sign of K2AA on the air for 24 hours. Field Day would not be field day without help. It takes a lot of help to setup, operate and breakdown the equipment for Field Day. This year we had a lot more help than last year and it really made a difference. We can always use more help. A special thanks to Dom KD2EPM and Gary KB2EBX for providing a fantastic lunch on Sunday, I can't wait to next year to see what they cook up for us. As a club we did a great job, conditions were good, the weather was excellent. Congratulations to all that participated. I already look forward to Field Day 2015, it is already less than a year away, are you making plans?

With some of the activities, it reminds us to be safe while working on our antennas or equipment. Accidents come with no warning. Towers, antennas and equipment can be replaced easily, but injuries are not so easily remedied. For this reason we have made SJRA Hard Hats available
(Continued on page 9)

Monthly Puzzle

Don – WA2DUE, wa2due at arrl dot net

What is the amplitude of the sine wave whose equation is $(1/5)y = 5(\sin 20)$?

Answer: The amplitude is the coefficient of the sine function which in this case is 25.

A foundation for a back yard deck requires concrete pilings of 14 inches in diameter each 30 inches in length. If 11 pilings are needed, how many cubic yards of concrete must be ordered to meet the job?

Answer: First we must find the volume of a cylinder whose radius is 7 inches and length is 30 inches. $V = \pi \times 7^2 \times 30 = 4,618.14$ cubic inches. Multiplying by 11 we get a total of 50,799.55 cubic inches or 1.09 cubic yards of concrete.

Exercise is needed in order to maintain muscle tone. So too the frontal lobes of the brain have to be exercised in order not to lose functionality. While keeping cool in July please consider the following:

The hexadecimal number 3F7 is divided by the hexadecimal number 23. Express the dividend as a number to the base 10.

Find the roots of the equation:

$$5X^2 + 20X = 105.$$

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

Wanted

Alternate Editor for SJRA Harmonics. This position does not require previous publication experience (only a computer with internet access) as **I will teach you all you need to know.**
Email: ted.w2tag at gmail dot com

The SJRA congratulates the following on their recent achievements:

Desmond Morris

2228 Cross St.

Philadelphia, PA 19146

Passed the Tech Exam

Lester Whinna, W9LAW

59 Pelham Drive

West Deptford, NJ 08051

Upgraded to General

Harry Kingsmill, K1NGY

76 Mishemokwa Trail

Medford Lakes, NJ 08055

Upgraded to Extra

Total new or upgrades to date: 99

	Tech	General	Extra
YTD	63	24	12

DXCC Country/Entity Report

According to the AR-Cluster Network for the week of Sunday, 6th-July, through Sunday, 13th-July there were 213 countries active. Countries available: 3A, 3B8, 3B9, 3D2, 3DA, 3W, 4J, 4L, 4O, 4S, 4U1I 4X, 5A, 5B, 5R, 5T, 5W, 5Z, 6W, 6Y, 7P, 7Q, 7X, 8P, 8R, 9A, 9H, 9J, 9K, 9M2, 9M6, 9V, 9Y, A4, A5, A6, A7, A9, AP, BV, BY, C3, C5, C9, CE, CE0Y, CE9, CM, CN, CP, CT, CT3, CU, CX, D2, D4, DL, DU, E5/s, E7, EA, EA6, EA8, EA9, EI, EK, EL, EP, ER, ES, EU, EX, EY, EZ, F, FG, FK, FM, FO, FP, FR, FS, FY, G, GD, GI, GJ, GM, GU, GW, HA, HB, HB0, HC, HH, HI, HK, HL, HP, HR, HS, HV, HZ, I, IS, J2, J6, J8, JA, JD/o, JT, JW, JY, K, KH0, KH2, KH6, KL, KP2, KP4, LA, LU, LX, LY, LZ, OA, OD, OE, OH, OH0, OK, OM, ON, OX, OY, OZ, P2, P4, PA, PJ2, PJ4, PJ5, PJ7, PY, PZ, S0, S5, S7, S9, SM, SP, ST,

(Continued on page 10)

(Presidents Message from page 7)

for a \$15.00 donation to the club. Each hat comes with sheet of SJRA stickers so you can proudly show our colors. Hard Hats will be available at SJRA meetings while supplies last.

Kathy, KM2KME, and Debbie, W9QWN, are no longer able to serve on the BOD. I want to thank them for their tireless efforts in supporting the club. With that we now have two Board Vacancies to fill, there will have an election at the next SJRA meeting.

There are following committee vacancies:

Health and Welfare

Co-Editor of Harmonics

History Committee (Mary KV2M would like to pass the torch)

Let me know if you would like to help. It takes people to operate and run the club. Your help would be greatly appreciated.

As the heat of the summer continues, everyone should be mindful of the staying hydrated. The other bad side of the heat is severe weather. Some of our members are experiencing this and hopefully by the time Harmonics is published things will returned to normal.

Thank you for being a member of the South Jersey Radio Association, encourage others to do the same.

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

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

(Meeting Minutes from page 3)

Contests- None. NJ QSO party in August.

Trustee- Ken, K2WB, reports that K2AA expires in August- renewal request has been submitted.

Club Stuff- Half of the hard hats were sold at Field day, others could have been sold, but they never got out of the car they were stored in. They will again be available at the general meeting. Rick, W2JAZ has volunteered to be the new programs chairperson. We still need a Health & Welfare and Publicity chair.

Programs- July; FD Wrap up: August- LOTW and demo of Ham Radio Deluxe logging software. September- Consignment auction.

VE- 96 tested so far.

Web team: Bob, W2SCJ is no longer hosting. He has expressed a desire to purchase the SJRA supplied UPS and Memory cards. Motion to sell them W2MC/N3RG. We need to add hosting fees and Domain registration as line items to our budget.

Field Day- No injuries or mishaps. Good attendance by the membership. Great article in the Burlington County Times. About 4800 Q's this year.

Old Business- Election for directors at the July meeting, Ken to prepare ballots. We will send letter of appreciation to Kathy, KM2KME, for her service. The 100th anniversary committee is organizing- only 2 years to go. Dennis, AC2FO, to send letter of thanks to the reporter from BCT and the Marlton Fire company, thanking them for their help with field day.

No new business.

Adjourn at 2050- N3RG/N3AVT

(Ham Tech from page 5)

vector identifies the two most probable data sets and then two different decode algorithms, identified as B and K in column 6 of Figure 1, are used. Algorithm B is used first because it requires less computer run time. When a successful decode is achieved the process ends. Note that the K algorithm in Figure 1 was used only twice in 12 messages.

Performance - JT-65HF can decode error free messages down to about 25 dB below noise in a 2 KHz bandwidth. Line 9 of Figure 1 is an example of a 21 dB down signal. Comparison of the sensitivity of error corrected JT-65HF against non-error corrected RTTY or PSK-31 can be approximated by normalizing the bandwidths to 2 KHz for both RTTY and PSK-31 C/N ratios that were calculated in the last two months of HAM TECH. For RTTY this equals + 4.9 dB and for PSK-31 it equals - 5.6 dB. Thus using this simple analysis JT-65HF is $25 + 4.9 = 29.9$ dB more sensitive than RTTY and $25 - 5.6 = 19.4$ dB for PSK-31. Impressive but you can't have a rag chew QSO.

Next Month - We briefly look at two conversational modes that have very good sensitivity using modulation similar to JT-65HF. They are MFSK-16 and DominoEx. This finishes the series on digital text modes.

(DXCC Report from page 9)

SV, SV5, SV9, T31, T5, T7, T8, TA, TF, TG, TI, TJ, TK, TR, TU, TY, TZ, UA, UA2, UA9, UK, UN, UR, V3, V4, V5, V6, V7, V8, VE, VK, VP2V, VP6, VP8, VP8/h, VP9, VR, VU, XE, XW, XX9, YA, YB, YI, YL, YN, YO, YS, YU, YV, Z3, Z8, ZA, ZB, ZC4, ZD7, ZD8, ZF, ZL, ZP, ZS

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 \$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*

July Meeting:**Fourth Wednesday, July 23, 2014**

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 July:**Field Day Wrap-Up**

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@SJRA.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

