Official Newsletter of the SOUTHEASTERN MASSACHUSETTS AMATEUR RADIO ASSOCIATION, INC.

ZERO BEAT

Southeastern Massachusetts
Amateur Radio Association, Inc.
54 Donald Street
South Dartmouth, MA 02748

Since 1932

Volume 50 Issue 3 | SEMARA–W1AEC | March 2014

W1BZJ/4, Portable 4

"My wife, Sue, and I are lucky enough to be able to spend February and March down in Naples, Florida.

The weather is great and lots to do down here. I used my D-Star equipment on the way down here to keep in touch with my friends up North.

We had a great drive down and missed any bad weather. I joined the local club down here, ARASWF (Amateur Radio Association of South West Florida) a few years ago so I also talk to some of the folks in the area. Last weekend I attended an event they call Winter Field Day.

They set up a few portable stations and had several small generators to power everything.

It's amazing how many people there are down here from Mass. Lots of ***"1"*** calls on the local repeaters.

BOB-WA1IDK & ELAINE-N1GTB

This is a photo of two new members of ARASWF, **Bob-WA1IDK** and **Elaine-N1GTB** from Natick, Massachusetts

And of course, the one thing all hams like to do is EAT.

I am also able to run my home station remotely so I've been checking into the Wednesday night 6 meter SEMARA net.

Hope to see everyone at the April business meeting." ~**Mike-W1BZJ/4**

MIKE-W1BZJ AT THE MIKE

D-STAR RIG: IC-2829H

OIL WELL PARK OUTING

ZERO BEAT
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It seems to me… de Bob - K1KVV, Editor

that February was a good time to pass the Technician license exam! There were ten who joined our ranks. One passed the ***February SEMARA VE Session*** and 9 who graduated from the *January Technician license class* that was presnted by **Tony Souza, NN1D**. [See the related discussion in the Feb. minutes on page 3.]

Download a *Membership Application Form*: **http://semara.org/files/documents/2011-09-04_membership_application.pdf**.

Radio History:

A Century of Amateur Radio and the ARRL

Following the resumption of Amateur Radio activities after World War I a thundering herd of advances in the state of the Amateur Radio art ensued . Here are some *highlights* from that period.

April 1922 – The first contact was made between California and Hawaii. ***September 1922*** – **1CCZ** worked every US call district in one night, the first time that had ever been accomplished. ***November 1922*** – Another record-breaking relay was accomplished, from **1AW** to **9AWM** to Hawaiian **6ZAC** and back to **1AW** in 4 minutes 18 seconds.

June 1923 – The first expedition using Amateur Radio sailed. The schooner *Bowdoin (WNP)* had **Don Mix, 1TS**, aboard as its operator. This and later Bowdoin expeditions were searching for the land mass that was thought to exist at the North Pole. ***September 1923*** – **VK2CM** contacted **ZL4AA** (a 1500 mile path), with **VK2CM** running 4 milliwatts on CW! ***November 1923*** – **1MO** and **1XAM** worked **F8AB**, the first transatlantic contact. ***December 1923*** – **1EH** made contacts with England, Italy, and Holland.

May 1924 – The first contact was made between New Zealand and Argentina, a new DX record of 6400 miles. The same month saw the first contact between North and South America. ***July 1924*** – All previous shortwave work had required "experimental" licenses. After considerable groundwork by the ARRL, the government allowed shortwave work by all amateurs, with band assignments of 1.5 to 2.0, 3.5 to 4.0, 7.0 to 8.0, 14.0 to 16.0, and 56.0 to 64.0 MHz. ***September 1924*** – The first confirmed contact was made between California and New Zealand. ***December 1924*** – The first daylight transconti-nental signals were heard, from Connecticut to California, as John Reinartz, **1QP**, made experimental transmissions on the new 20 meter band.

(To be continued …)

POINT TO PONDER

"To accomplish great things, we must not only act, but also dream; not only plan, but also believe. "

~Anatole France

Official Meeting Minutes

February 6, 2014

The meeting was called to order at 7:10 PM by the President **Marcel (W1MLD)** with salute to the flag. The roll was called with 17 members and 0 guests present.

SECRETARY'S REPORT

The Secretary **Marc (KB1ODE)** reported there was no January meeting due to a lack of quorum.

TREASURER'S REPORT

The Treasurer **Mike (KB1NB)** reported major expenses the past month as property tax ($1812.00) and electricity ($180.00), total revenue as $0.72 (interest earned) and two checks were received from NETCOM for this month. Total assets are $61,843.00. A motion was made, seconded and unanimously approved to refer the report to audit.

STANDING COMMITTEES

Buildings and Grounds

Joe (N1IXC) reported that it was necessary to replace a circuit breaker for the east side heating circuit, which stopped working. The repair has been completed.

Scholarship

Sonny (K1USW) reported that scholarship announcements had been sent out to 16 schools the past month. There has been no response yet. Applications are due by April 1, 2014.

SPECIAL COMMITTEES

ARES, RACES, SKYWARN

Joe (N1IXC) reported the drill last Monday had few check ins and encouraged anyone to participate during drills.

Radio Events

Bob (K1KVV) reported several events as listed, including School Club Roundup and the North American QSO Party. **Fred (N1TF)** also mentioned State to State event posted on **ARRL.org**.

COMMUNICATIONS

Mike (KB1NB) read a letter from a local real estate agent advising that property abutting SEMARA property was available for purchase. No further action was taken.

RATIFICATION OF NEW MEMBERS

An application for membership was received from **Joseph A. Tavares**, a new General licensee (no current call). A motion was made, seconded and unanimously approved to admit Mr. Tavares as a life member.

OLD BUSINESS

There was some discussion regarding the potential purchase of an *Automatic External Defibrillator* to be kept on the premises. It was advised that a short class would be required for certification to use the equipment and the cost for the unit could be approximately $1595.00. There was considerable interest from the members and we will look into more information regarding products and classes.

NEW BUSINESS

There was discussion regarding the poor condition of the parking lot as it had not been plowed after the recent snow storm. The President will look into why the lot was not plowed.

FOR THE GOOD OF THE CLUB

There was some discussion about the past month's successful Tech Talk on backup power sources as well as the subject of possibly advertising the availability of SEMARA's scholarship in the ARRL. There was also discussion regarding generating interest in SEMARA membership. After much discussion, **Fred (N1TF)** offered to devise a promotional offer to new licensees to include *SEMARA membership, membership in the ARRL and a **Baofeng** 2M, 70CM handheld transceiver* and present it to a committee to be named shortly. A ***motion*** was then made to allocate monies to purchase 6 to 12 Baofeng radios, depending on the best price available. Further, after discussion with the Finance Committee and Treasurer, to purchase said radios, the *motion was seconded and unanimously approved*.

The President, **Marcel (W1MLD)** also thanked the VE team for assisting with the testing on February 5, 2014 at the class given by **Tony (NN1D)**.

Brad (W1BEP) mentioned that his D-Star repeater was coordinated with a frequency of 146.10 MHz and a minus split of 1.5 MHz.

ADJOURN

A motion was made, seconded and unanimously approved to adjourn the meeting at 8:20 PM.

Respectfully Submitted,

Marc M. Dumont (KB1ODE), *Secretary*

Tidbits

New Techs

Passed on Feb. 1: **Travis Rebello - KC1BEQ**

Passed on Feb. 5: **Howard Wong - KC1BFX,**
Tony S. Vincent - KC1BFY,
Troy D. Vincent - KC1BFZ,
Scott P. Stanton - KC1BGA,
Robert J. Enos, II - KC1BGB,
Irene J. Harrop *(N1PMB's YL)* **- KC1BGC,**
Robert J. Enos - KC1BGD,
Richard A. Krieger - KC1BGE, and
Joseph A. Tavares *(also passed General)* - KC1BGF.

Welcome to the exciting world of Amateur Radio.

LOCAL NETS

Everyone is welcome to check in!

147.000+ (PL 67.0 Hz) (FM) — Massachusetts RACES/ACS Drill (Region 2, Sector A) is held on the first Monday of the month at 7:30 PM.

50.200 MHz (FM) — Net is held Wednesdays at 8:30 PM. **Brad, W1BEP** (E. Freetown) is net control.

28.490 MHz (USB) — Net is held Tuesdays at 8:30 PM. **Dick, K1AHA** (S.Dartmouth) is net control.

1875 kHz (LSB) Net is held Fridays at 7 PM. **Dave, K1JGV** (S. Dartmouth).

If QRN is too high, look for them on **50.200 MHz** (USB)

50/50 RAFFLE

The 50/50 raffle prize of
$16.50
for February was won by **Brad, W1BEP**.

Club Numbers

GPS Coordinates:
Lat. N 41° 36.795'
Long. W 070° 56.550'
— o —
Maidenhead Grid Coordinates: FN41mo
— o —
For FISTS Sprints: FISTS #10555

LOCAL REPEATER DIRECTORIES

See http://www.nerepeaters.com/se.htm
144 (http://www.nerepeaters.com/2m.htm)
222 (http://www.nerepeaters.com/222.htm)
440 (http://www.nerepeaters.com/440.htm)
902 (http://www.nerepeaters.com/902.htm)

NEXT VE SESSION @ SEMARA

April 5, 2014
Clubhouse @ 10:30 AM
Contact: **Fred Bacon-N1TF**
exams [at] semara [dot] org
508-748-0047

CLUB ACTIVITIES

BUSINESS MEETING
First THURSDAY of the month @ 7 PM

Sunday RAGCHEW 7-10 AM

Thursday COFFEE CROWD
Dunkin Donuts - Dartmouth & Garfield
Dartmouth @ 1 PM

Friday LUNCH BUNCH
Leave for LUNCH at **12 noon**
Gather @ clubhouse before 12 noon

Call on the repeater, if you wll be delayed or you can phone the club: 508-997-7070

50 MHz and Up

Kits

by Rich-W2RG

I'm rediscovering kits. I believe in the old claims that by building kits you (1) save money, (2) learn more about radio in general, and (3) understand your equipment better, so you can (sometimes) repair it yourself. I've been building more kits in recent years, and I'd like to share some of that with you in the next few articles.

Years ago, many new Hams got on the air by buying and assembling kits and "kit" pretty much meant "Heathkit®." New Hams often needed help or tools from more-experienced Hams, and the collaboration was good for Amateur Radio. Unfortunately, Heathkit sort of withered away, and though they claim they're back (see **http://www.heathkit.com/heathkit-faq.html**), they don't have anything to sell yet.

Fortunately, today you can get a wide range of kits from a wide range of new companies. Some kits are full-featured HF/VHF rigs, such as those offered by Elecraft (**http://www.elecraft.com**). I haven't built an Elecraft rig, but some of my Ham friends are very complimentary towards them, and their performance numbers compare well with some of the finer commerially-built Ham rigs (see, for example, **www.sherweng.com/table.html**). I've had a chance to use an Elecraft K2 transceiver and an XG3 calibrator, and I was impressed by both.

Most of my kit-building recently has been assembling transverters and relatively simple building blocks like oscillators and one- or two-stage amplifiers. These are easy projects that most any Ham could handle. Great experience and fancy tools are not needed. Here are a few examples.

PHOTO 1 - 540 MHz LO

Photo 1 shows an assembled printed circuit (PC) board from a 540 MHz oscillator kit by Mini-Kits, an Australian company (**https://www.minikits.com.au**). I've mounted the board in a simple box made from sheets of hobby brass. This kit uses wire-leaded, "though-hole" components, and assembly is easy. This Mini-Kit kit cost $36, plus about another $20 for the crystal of my choice. That's Australian dollars, which are generally of about the same value as U.S. dollars. I've checked the performance on a spectrum analyzer, and it is very good.

PHOTO 2 - X4 MULTIPLIER

The oscillator is taped to the top of another Mini-Kits product (***photo 2***) – a voltage multiplier that increases the frequency from 540 to 2160 MHz, with some filtering to remove harmonics. Sorry, I forgot to take a picture of the innards before sealing the box with copper tape, but it's mostly just a comb-like filter etched on a PC board. This kit has very few parts and went together in minutes. The combination of the 540 MHz oscillator and the frequency multiplier will become the local oscillator (LO) of a transverter to convert the 2304 MHz microwave band to 2 meters. (2304 MHz - 2160 MHz = 144 MHz.)

The 2304 transverter, and a few other little projects I'm working on, will need several simple amplifiers. I'm using kits from Down East Microwave Inc. (**www.downeastmicrowave.com**).

You can buy DEMI amplifier kits that consist of bare-bones PC boards or complete kits with boards and all the parts. The kits with parts cost only $14 for a 2-stage amplifier and come with your choice of MMIC's. MMIC's are small integrated-circuit amplifiers that are very simple to use because they basically have only three connections: input, ground, and a combined output/+volts. In a 2- stage amplifier, the available MMIC's will provide gain of 15 to 25 dB from a few tens of MHz to about 8 GHz.

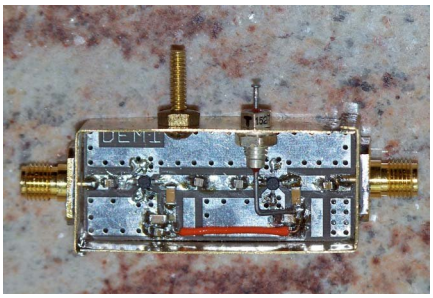

PHOTO 3 - WIDEBAND AMP

Photo 3 shows an assembled kit that uses two ERA-2 MMICs. The DEMI boards are good quality, with lots of plated-through holes – an important feature for good grounding at UHF and microwave frequen-

(Continued on page 7)

Practical Radio

Amplifier vs. Antenna*

Why you should choose the antenna first.

It's a question we get at the Handiham office again and again: *"What kind of amplifier should I get for my station?"*

Sometimes the station turns out to be a VHF-FM mobile rig with plenty of RF punch already built in - usually at least 50 watts. Other times the questioner owns a perfectly good 100 watt HF transceiver. My answer is almost always the same: *Don't bother with an amplifier.*

Instead, put up a better antenna. It's just plain physics. The antenna will get more of your signal where it needs to go. This is better for the RF environment because you are operating with relatively modest power levels that are unlikely to trigger the need for RF exposure mitigation or cause RF interference to other devices in the vicinity.

A directional antenna can also cut down interference to other amateur stations when you transmit. The directional antenna does a better job of receiving, too. Not only will the station you are in contact with sound louder, but interference off the back and sides of your directional antenna will be diminished.

Amplifiers can have their place, but you really don't need one unless you are working under extremely difficult conditions. An example would be if you are a net control station for a 75 meter daytime net. Extra power can cut through the noise and absorption on that band under those conditions.

What are some disadvantages of amplifiers?

• One is that they are expensive, and considering how they can only improve your transmitted signal and not your received signal the way an antenna can, you would be better off spending the money on a better antenna system.

• Another is that they are thirsty for current - lots of it - and may require special consideration in how you supply them with it. Large HF linear amplifiers may only operate well if you run an additional 220 volt circuit to the ham shack. VHF-FM amplifiers are going to require some hefty power supplies, because FM is 100% duty cycle and will draw lot of current at full capacity.

• The switching can be an issue. Amplifiers are not ***"plug & play"*** devices. You need to make sure that your amplifier switches in tandem with your transceiver as you go from receive to transmit and back again. Levels must be considered, too.You may have to make up special cabling or interface circuitry to match the two devices safely.

• The entire antenna system must be capable of supporting high power.That means everything in the antenna circuit, including any metering, antenna tuners, the feedline, antenna switches, lightning arrestors, the balun, and the antenna itself.

• Amplifiers can turn trivial problems into major headaches. For example, there may be a bit of RF in the vicinity of your feedline, but ordinarily it goes unnoticed because of its low power level. Add an amplifier and suddenly that RF is getting into ground fault interrupters, the neighbor's stereo system, and the smoke alarms. Any distortion on your signal will be worse if you amplify it.You may get complaints from other hams whose QSOs you have interfered with, even though you might barely hear them in your receiver. Using an HF amplifier can also cause a voltage drop in your house circuits that can cause the lights to dip when you modulate the rig.

Given the many potential problems with amplifiers, I seldom recommend them. Most of the newbies who ask about them have no idea of the extra requirements, and they have not even thought about how they will need expensive power supplies or big antenna tuners! Please consider putting your resources - time and money - into a better antenna system before you ever consider an amplifier. Now, with the March QST annual antenna issue available, it is the right time to start planning a better antenna system.

This is practical radio, so use what works for you.

* *Courage Kenny Handiham World Weekly E-Letter for the week of Wednesday, 12 February 2014*

Extra Exam Question*

E9B14: What type of information can be obtained by submitting the details of a proposed new antenna to a modeling program?

A. SWR vs. frequency charts

B. Polar plots of the far-field elevation and azimuth patterns

C. Antenna gain

D. All of these choices are correct

The right answer is D. All of that information comes from modeling software. Incidentally, you are bound to read antenna articles that refer to modeling software. Using software based on the "Numerical Electromagnetics Code", or NEC for short, is common now in antenna design. The software performs a complex analysis of the design you want to test by taking segments of equal current within the antenna design and comparing them. Okay, that's a gross oversimplification, but suffice it to say that modeling software can prevent a lot of sweat and tears as you run back and forth, trying to perfect your antenna design with a wire cutter instead of a computer! Why do all that "cut and try" when you can model the antenna and work out most of the bugs before you even roll up your sleeves to put the real thing together?

* *Courage Kenny Handiham World Weekly E-Letter for the week of Wednesday, 12 February 2014*

Amateur Radio News

NEW HF OPERATORS - THINGS TO DO*

Technician operators really enjoy the fun of operating 10 meter phone during the ARRL International DX Phone Contest, coming up this weekend. With solar flux plenty high enough to open the polar paths, this will be a great time to see what your HF phone privileges can do!

Speaking of privileges - you might want to download a copy of the ***US Amateur Bands chart*** [**www.arrl.org/graphical-frequency-allocations]** and there is another specifically for ***Technicians*** [**www.arrl.org/files/file/Ham%20Radio%20License%20Manual/Tech%20Band%20Chart.pdf].**

SEMARA's 10 Meter Net

28.490 MHz (USB) — Net is held Tuesdays at 8:30 PM. **Dick, K1AHA** (S.Dartmouth) is net control. Tune us in, or better yet, check-into the net for a few minutes of fun and traditional ***"rag-chewing."***

ARRL Kids Day - June 21, 2014*

It is 1800 UTC through 2359 UTC (2 - 8 PM) 21 June and always on the third Saturday of June. Mark your calendars and gather the kids for a fabulous afternoon.

Website of the Week*

It was 101 years ago that Edwin Armstrong demonstrated his "regenerative detector" and changed receiving and receivers – and ham radio – forever. The story is outlined in this ***Electronic Design magazine article*** [**http://electronicdesign.com/blog/armstrong-and-sarnoff-101-years-ago**] including an opportunity to copy the sounds of alternator-generated signals as Armstrong heard them, nearly a century ago.

Word to the Wise*

"Never trust a meter that reads zero."

Contributed by **Bill W6WRT**.

Operating Tip*

Phone contesting (or emergency net control, for that matter) is a very physical activity with a lot of wear and tear on the vocal cords and your "hollerin' parts". Minimize stress on yourself (and others in the same house or EOC) by setting your audio and mike gain to levels that are comfortable for listening and speaking. The louder you yell, the worse your audio gets, making it hard to understand, so you tend you yell louder, and...well, you get the idea. *Speak softly and submit a big log!* (I know several ops who take the opposite tack and do okay, though...)

* *The ARRL Contest Update for February 26, 2014*

(**Kits** continued from page 5)

cies. The parts count is small, so it takes about 20 minutes to assemble one kit. The box/enclosure is another story, of course. They're inexpensive, but they do take some time to make. DEMI offers a couple of alternatives, but I like making my own out of hobby brass (***photo 4***).

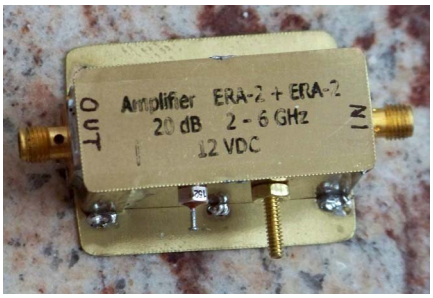

PHOTO 4 - ENCLOSED AMP

Some Hams shy away from the new surface-mount devices (SMD) and construction methods shown here. I think they're wonderful. Commercial fabricators are indeed using parts so small that most Hams can't cope with them, like SMD resistors and capacitors that are only 0.02 inches wide. But Hams can get a lot done with the "larger" 0.08 to 0.12 parts. I find these easy to work with. Also, they're generally cheaper than non-SMD, wire-lead parts, especially in some of the odd-ball non-standard resistance or capacitance values.

In future articles, I'll try to show more of other kits of varying complexity that I have experience with. I encourage both new and experienced Hams to check out the broad range of kits now available for Amateur Radio, whether you need a new radio, a transverter, some test equipment ... whatever. And don't hesitate to contact me (**w2rg [at] verizon [dot] net** or **discussion [at] semara [dot] org**) *if there's anything you want to discuss about these* ***Zero Beat*** *articles. I'm a Ham – I enjoy talking!*

Radio Tests & Fests

Some Radio Activity

http://www.arrl.org/contest-calendar

1.8-28 **ARRL Int'l Phone DX Contest**
phone www.arrl.org/contests
Mar 1, 0000Z - Mar 2, 2359Z

3.5-28 **ARS Spartan Sprint**
CW www.arsqrp.blogspot.com
Mar 4, 0200Z - Mar 4, 0400Z

3.5 **YL CW Party**
CW www.agcw.de
Mar 4, 1900Z - Mar 4, 2100Z

1.8-14 **NS Weekly Sprint**
CW www.ncccsprint.com
Mar 7, 0230Z - Mar 7, 0300Z

3.5-28 **RSGB Commonwealth Contest**
CW www.rsgbcc.org
Mar 8, 1000Z - Mar 9, 1000Z

3.5-28 **AGCW QRP Contest**
CW www.agcw.de
Mar 8, 1400Z - Mar 8, 2000Z

3.5-28 **QRP ARCI HF Grid Square Sprint**
CW www.qrparci.org/contests
Mar 8, 1500Z - Mar 8, 1800Z

3.5-28 **EA PSK63 Contest**
digital www.ure.es
Mar 8, 1600Z - Mar 9, 1600Z

3.5-28 **Idaho QSO Party**
all-modes www.idahoarrl.info/qsoparty
Mar 8, 1900Z - Mar 9, 1900Z

3.5-14 **North American RTTY Sprint**
digital www.ncjweb.com
Mar 9, 0000Z - Mar 9, 0359Z

3.5-28 50+ **Wisconsin QSO Party**
all-modes www.warac.org
Mar 9, 1800Z - Mar 10, 0100Z

3.5-28 **BARTG HF RTTY Contest**
digital www.bartg.org.uk
Mar 15, 0200Z - Mar 17, 0200Z

1.8-28 **Russian DX Contest**
phone-CW www.rdxc.org
Mar 15, 1200Z - Mar 16, 1159Z

3.5-14 **North American Sprint**
phone www.ncjweb.com
Mar 16, 0000Z - Mar 16, 0359Z

Coming FLEAS & FESTS

www.arrl.org/hamfests/search

15 Mar **Dayville CT** ECARA
Paul KE1LI 860-928-5147

16 Mar **Southington CT** SARA Flea Market
www.chetbacon.com/flea2013.pdf

28,29 Mar **Lewiston ME** AARC ME Conv
Ivan N1OXA 207-784-0350

18 Apr **S. Portland ME** PAWA
John W1JLB 207-776-2288

27 Apr **Middletown NY** OCARA
Neil AC2O 914-490-2001

2,3 May **Deerfield NH** **NEARfest XV**
Mike K1TWF 978-250-1235

17 July **Hartford CT**
ARRL Nat'l Centennial Conv
ARRL2014.org

1.8-28 **Run For the Bacon**
CW www.fpqrp.org
Mar 17, 0200Z - Mar 17, 0400Z

3.5-14 **NAQCC Monthly QRP Sprint**
CW naqcc.info
Mar 20, 0030Z - Mar 20, 0230Z

1.8-28 50+ **FOC QSO Party**
CW www.g4foc.org
Mar 22, 0000Z - Mar 22, 2359Z

1.8-28 50,144 **Louisiana QSO Party**
all-modes laqp.org
Mar 22, 1400Z - Mar 23, 0200Z

1.8-28 50+ **QCWA Spring QSO Party**
all-modes www.qcwa.org/qso-party.htm
Mar 22, 1800Z - Mar 22, 1800Z

1.8-28 **CQ WPX SSB Contest**
phone www.cqwpx.com
Mar 29, 0000Z - Mar 30, 2359Z