Next Meeting: March 1, 2016 - B Scott Andersen, NE1RD – Buddipole in the Field

Scott literally wrote the book on building antennas with the Buddipole system. Learn about how these antennas work, how Scott has used them on multiple 100 pound DXPeditions to the Caribbean, and how you can build portable antennas out of Buddipole components.
We had our second Tech Night on Tuesday, February 9th. The topic for our second Tech Night was “Advanced Repeaters – DMR, DSTAR, Echo link and APRS”. The session was led by Bill Barber, Fred Kemmerer, and myself. We had another great turnout of well over 20 club members.

We covered quite a bit of information on advanced repeater operation and there were some great discussions along with each session.

The Echo link session covered how to setup and configure the PC software, how to connect to repeaters and conferences, and we had a live roundtable conversation among folks in the room with others on a local repeater.
Tech Night (continued)

The DMR session was an extension of the February club meeting presentation and focused on configuration details. After the presentations, Bill held a hands-on workshop session with a member who had just purchased a DMR handheld on how to set it up.

The APRS session focused on the APRS architecture and included some videos and demonstrations of an I-Gate and the APRS.fi website.

The DSTAR session focused on the architecture, radio selection, use of reflectors and features of the DSTAR system.

A video of the session is available online at https://vimeo.com/user47990731/feb2016_technight
Software Defined Radios – The Future of Amateur Radio?
by Fred Kemmerer, AB1OC

Computers and Digital Signal Processing already play a big role in recent Amateur Radio transceivers. Many HAMs have a good understanding of these features and regularly use them for all manner of filtering, noise reduction and signal processing tasks while on the air. We’ve also seen more and more radios with Spectrum Scopes which make it easier to visualize what is on a given band in real time. Thanks to increasing volumes in color displays, Digital Signal Processor (DSP) applications and low-cost processors, these capabilities are now common – even on entry level HF transceivers.

Software Defined Radios (SDRs) are the next logical step in this evolution. SDRs are not new, they have been around for some time now. SDR technology has continued to improve as the cost and performance of Analog to Digital Converters, Programmable Logic Devices and other processors that make up the hardware side of SDRs have improved. We are now to the point where it is possible to build an SDR for Amateur Radio applications which can directly sample RF at frequencies as high as 150 MHz.
Direct Sampling SDR receiver designs have some important advantages over more conventional single conversion and super heterodyne receiver (i.e. multiple conversion) designs. These include:

- Much higher dynamic range
- Very low phase noise
- Ability to cover multiple bands simultaneously with multiple receivers
- Very high-quality spectrum displays
- Flexible, high-performance filters
- The ability to add new modulation schemes and other features via software updates

The first two items above (dynamic range and phase noise) are particularly important as they result in receiver performance which is significantly better than that which can be achieved with the best direct and superhet designs. Take for example a busy contest environment when a band is very crowded (ex. 40m at night in a worldwide DX phone contest). There are many strong signals crowded closely together on the band. Even the best conventional design receivers will have trouble hearing moderate and weak signals in this environment. The problem is that the strong signals tend to overload the analog circuitry in the conversion stages of conventional radios which produces a great deal of intermod distortion products. Phase noise also compounds this problem.

A direct sampling SDR converts the incoming RF signals with high dynamic range Analog to Digital conversion and then performs all of the filtering and demodulation of the incoming signals in software. This approach limits the potential for intermod distortion with an end result that all of the signals on the band (including the weaker ones) are much clearer. This approach also allows very high order filtering to be applied in the RF domain which results in greatly improved selectivity and rejection of closely spaced adjacent signals with minimal distortion.

By now some may be think that this all sounds great but I don’t want to have to use my computer to make QSOs. There is good news on this front as well. We are beginning to see the major transceiver manufacturers introduce direct sampling SDR technology in radios with conventional “buttons and knobs” interfaces.
Icom IC-7300 Direct Sampling Transceiver

New designs like the Icom IC-7300 provide a way to gain the performance and feature advantages of an SDR in a radio which has a more conventional interface. The entry of the major manufacturers into the direct sampling space and the resulting competition should help to lower prices for all types of SDRs.

RTL-SDR Dongle

Want to give SDR technology a try without spending a lot of $? There are several very good SDR Dongles available along with SDR software at a minimal cost. Dongles are typically receive-only but some can also transmit as very lower power. The use of this technology in digital TV receivers and set top boxes has made the cost of SDR Dongles very low (in the $25 range) and there is some very good SDR software available for free on the web. Dongles are generally broad coverage receivers and they can also be used to listen to signal outside the HAM Bands.

We are going to be talking about SDRs at our Next Tech Night coming up on March 8th. I hope that you’ll join us for what should be a very interesting discussion.
INTRODUCTION:
President Fred Kemmerer AB1OC started the meeting at 7:00 PM and asked members to introduce themselves by giving their name, Call sign and to share some of their Amateur Radio contacts. A total of 40 members/guests were present for the introductions.

Treasurer Wayne Wagner AG1A discussed his review of the treasury report and provided a summary status report. Secretary Mike Ryan K1WVO provided a brief summary of the January Board of Directors (BOD) meeting.

Aron Insinga W1AKI discussed the 2016 National Parks On The Air (NPOTA) event which will run all year and suggested the Nashua ARC become involved and use the N1FD club Call sign. The 2016 NPOTA event could provide an opportunity to recruit new licenses among the parks visitors. The Lamprey Wild and Scenic River in Epping was discussed and the use of the WARC bands for the event. The Lamprey location offers a much shorter 45 Minute commute from Nashua. Our club would need to obtain a special use permit from the NH National Park authorities for our NPOTA activities.

Anita Kemmerer AB1QB introduced a new Elmering Program for our club. Anita indicated that Bill Hammond KA1SSR had setup an email list (elmer@n1fd.org) for elmering purposes. The idea is that members can post questions and get help and suggestions from other members who have experience in the area that the person is interested in. Anita has also created a survey the help our members let others know about areas that they can provide elmering help for. The survey can be found at –

https://www.surveymonkey.com/r/BBCZRTZ

If you would be interested in helping by answering questions on various Amateur Radio topics and you have not already completed the survey, please take a moment and do so online.

PROGRAM:
Bill Barber – NE1B, presented his talk titled “DMR: A new mode for Amateur Digital Radio". DMR or Digital Mobile Radios use Digital Voice (DV) Codec to transmit voice and data using 4 level FSK digital modulation. Bill stated that his Ham Radio interests pulled him into 39 years with Motorola Land Mobile Radio and microwave communications, and he is now retired. Bill’s presentation provided significant technical background information about DMR technology, with its superior voice quality, reduced channel bandwidth and extended battery life.

Bill NE1B began his discussion of the many benefits of DMR: Based on a published ETSI worldwide standard; Over a dozen radio manufacturers; Superior Digital Voice (DV) quality; Longer Battery life; Automatic Roaming; Support for multiple talk groups on one frequency; and supports Data applications (txt, email, GPS, etc). Bill outlined DMR Standard – ETSI TS 102 361 with its 3-Tier communications structure and the adoption of ETSI Tier 2 to create DMR for Amateur Radio. DMR features a 2-slot TDMA modulation scheme and IP site internet connectivity (vendor specific). A brief demonstration of the superior quality of the Digital Voice was provided at the meeting. Bill NE1B compared benefits of DMRs 2-slot TDMA/AMBE+2 Vocoder against Icom’s D-Star GMSK/AMBE Vocoder and Yaesu’s C4FM System Fusion with FDMA/C4FM/AMBE+2 Vocoder radio systems along with two additional P25 Digital Voice systems implemented for public safety use.
converted to digital data and subjected to compression algorithms to build data packets for transmission by
the Vocoder Digital Signal Processors (DSP) and the process is reversed to extract or Decode the Audio stream.
Each DV radio system type employ a single RF modulation scheme such as FDMA (Frequency Division Multiple
Access), TDMA (Time Division Multiple Access) and GMSK (Gaussian Minimum Shift Keying). All of these
different RF modulation schemes are designed to conserve RF spectrum usage while providing all of the design
goals and features of the radio system designers.

Bill NE1B explained the benefits of DMR’s two-channel Digital TDMA System which alternately multiplexes
two separate data streams onto a single repeater system channel. This results in lower infrastructure cost with
one box in a rack providing Two Voice/data channels from a single repeater. The 2-slot DMR (Motorola
MOTOTRBO) TDMA voice occupies half the channel bandwidth of the traditional analog radio repeater. Bill
explained that DMR is more efficient than older analog FM modes because of the integrity of the digital
packets received with CRC check and Forward Error Correction features. Validated digital packets are
decoded, decompressed and converted to a noise free analog signal even under marginal weak signal
conditions. Bill also explained that the 2-slot TDMA modulation scheme resulted in an estimated 40% improvement
in talk time due to a much lower transmitter duty cycle.

Bill NE1B reported that significant DMR information is available online at dmr-marc.net website which was
developed by the Motorola Amateur Radio Club. To appreciate the locations covered by the DMR network,
click on the Repeaters tab or go to www.dmr-marc.net/repeaters. Currently there are more than 25,000+
registered DMR users. DMR repeaters can allow local peer to peer communication as well as using Voice Over
Internet Protocol (VOIP) providing the transportation backbone to route the DV packets between two network
masters or repeaters. DMR users must be registered with the network Master which keeps it informed about
other peers. High performance c-Bridge routers typically handle 15 – 20 groups of master repeaters into a
highly efficient system that manages packet distribution and provides arbitration for dual transmissions. A list
of local DMR repeaters was provided along with a chart showing exponential signup growth.

Bill discussed the DMR Association of Equipment Manufacturers and exhibited images of several models along
with several different DMR radio types that he brought along for his presentation. It is important to note that
DMR radios are single band VHF or UHF radios designed for commercial applications, and are capable of
encryption (which is illegal for Amateur use). The DMR radios use internal memory to store repeater
frequencies and networking controls. The DMR user must register the radio and then program it with his
assigned ID information to configure it for Amateur use before the radio can be successfully connected to a
network repeater or node. Multiple Custom programming software utilities help simplify system setup with a
computer and a serial communications cable.

Bill provided a list of Ham Friendly Dealers – those more familiar with Amateur radio use of the commercial
DMR radios and willing to deal with the small quantity sales. Alternative sources for DMR radios are available
online from EBAY and local dealers. The DMR presentation by Bill Barber NE1B was highly informative and
generated a lot of excitement from those who attended. Thanks for an excellent presentation Bill, it is sure to
inspire many to explore this new radio communications mode.

**STATUS:**
Membership Director Charles Burrill KC1ECE reported more club membership renewals bringing the club’s
membership to 81 regular and 9 lifetime members for a new membership total of 90.
The Pizza Night schedule was updated and has been posted on the N1FD.ORG website. The regular Saturday breakfast will continue to be held at 7:00am at Joe’s Dinner - Amherst, NH.

Next Meeting:
The Nashua ARC will hold its next Tech Night meeting in the basement of the First Church of Nashua on February 9th starting at 7 PM. The meeting will be a panel discussion on a number of repeater related topics: DMR; DStar; Echolink; and APRS. The meeting should be very informative and will explore some new ways to leverage our VHF/UHF bands for improved radio communications. The Tech Night meeting is open to all interested members.

The next Board of Directors (BOD) meeting will be held on February 23 in the community conference room at Dunkin Donuts located at 239 Main Dunstable Rd. in Nashua (exit 5), starting at 7 PM. In order to use this with no charge to the club, the manager has asked us to not bring any food from outside Dunkin Donuts into the conference room. The BOD meeting is open to all interested members.

The next regular club meeting will be held on March by 1st 2016, and will feature a presentation by Scott Andersen, NE1RD - “Buddipole in the Field”. Having no further business, the club meeting was adjourned at 09:00pm.

The Nashua Area Radio Club has established its presence on social media

Our web page link is (www.n1fd.org)

Our Facebook link is (https://www.facebook.com/NashuaAreaRadioClub)

Our Twitter link is (https://twitter.com/n1fd narc/)

Our Instagram link is (https://www.instagram.com/n1fd narc/)

Our vimeo link is (http://vimeo.com/user47990731)

Please check out our links and tell us what you think or maybe you have something share!!!

Like us on Facebook

Send us a tweet

Share a photo and a message on Instagram
Radio Licensing Classes

Registration is now open for our Ham Radio Licensing Classes.

Are you interested in upgrading your license? Do you know someone who is interested in upgrading their license? We will be giving General, and Extra classes this time. Here is the schedule:

- **General Class: Saturday and Sunday March 19-20**
- **Extra Class: Friday – Sunday May 13-15**

All classes will be held at Dartmouth Hitchcock Nashua. There is pre-study for each class, which is to purchase and read the Gordon West General, or Extra class book and complete a pre-work assignment based on the book content. An exam session will be held at the end of the class. Cost is $20 for the Tech or General Class and $30 for the Extra Class.

To register, contact Anita Kemmerer, AB1QB at ab1qb@arrl.net or 603-321-6115.

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A message from the webmaster Bill Hammond KA1SSR

Want to get the latest Club news? Subscribe to the NARC Members mailing list!! Point your favorite browser to

http://n1fd.org/mailman/mailinfo/members_n1fd.org , fill out the form and you are on your way. Please Note:

Due to the ungraceful way Mailman our mailing list software handles redirected addresses we ask that you sign Up using the e-mail address that you send mail from (e.g. n0cal@dev.null) rather than your arrl.net address(e.g.nocal@arrl.net). This would be great for everyone!! Thank you Bill KA1SSR

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NARC Club Badge Order Form

Please print your First Name and Callsign as you would prefer them to appear on the badge:

<table>
<thead>
<tr>
<th>Price: $5.00 each</th>
</tr>
</thead>
<tbody>
<tr>
<td>Send (or give to): Treasurer, Nashua Area Radio Club, P O Box 248, Nashua, NH 03061</td>
</tr>
<tr>
<td>Please make checks payable to: Nashua Area Radio Club</td>
</tr>
<tr>
<td>Badges will be mailed.</td>
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The Quarter Century Wireless Association (QCWA) has honored ARRL President Emeritus Harry Dannals, W2HD, for his 70 years as a radio amateur. QCWA Chapter 155 in Charlottesville, Virginia — where Dannals lives — hosted a celebratory luncheon for Dannals on February 3. Dannals also is a QCWA President Emeritus.

Dannals served as ARRL President from 1972 to 1982, and as President of the QCWA from 1989 to 1994 — the only person to have been president of both organizations. Now in his late 80s, Dannals is the oldest living former ARRL President.

In a letter, QCWA President Ken Oelke, VE6AFO, commended Dannals’ contributions to Amateur Radio. Luncheon attendees also included QCWA Past President John Johnston, W3BE, and ARRL Past President Kay Craigie, N3KN. Both commented on Dannals’ devoted service to the ARRL and the QCWA. Craigie said that Dannals has set an example of “cheerfulness and enthusiasm, and friendliness to all hams, whether they qualify for QCWA twice over or are so new that they haven’t memorized their call signs yet.”

Craigie said the luncheon was a complete surprise to Dannals.
Board of Directors Meeting Highlights - January 27, 2016

By Mike K1WVO, NARC Secretary

Attendees Present: President Fred Kemmerer (AB1OC); Vice President Layne LaBaume (AE1N); Secretary Mike Ryan (K1WVO); Treasurer Wayne Wagner (AG1A); Activities Director Anita Kemmerer (AB1QB); Membership Director Charles Burrill (KC1ECE); Publicity Coordinator John Halbert (W1SMN); Webmaster Bill Hammond (KA1SSR) and visitors Aron Insinga (W1AKI), John Yurcak (K9AEN), Terry Newport (W1YQ) and Kristina White (KC1EMH). Absent: Programs Director John Keslo (W1MBG) due to illness.

Location: The Board of Directors (BOD) Meeting was held at Dunking Donuts community conference room at 239 Main Dunstable Rd. in Nashua (exit 5).

Meeting: President Fred Kemmerer - AB1OC, began the meeting at about 6:50 PM.

Membership Director Charles Burrill, KC1ECE has stepped in to develop a new format for the February newsletter which was shared with the BOD. Charlie will be transitioning the newsletter effort over to Kristina White - KC1EMH. Copies of the Club newsletter can be found on the Clubs website and also in limited printed quantities at Ham Radio Outlet in Salem NH.

Wayne Wagner - AG1A, provided a 2015 treasurers report showing receipts, disbursements and a club balance ending Dec 2015 of $3,381.40. Wayne has started using Quicken software to track and manage the club treasury. He is developing a new budget plan for 2016.

The Audit Committee, John Yurcak - K9AEN, and Terry Newport - W1YQ, provided a brief summary of the successful audit of the 2015 treasury report. The Audit committee liked Wayne’s plan to convert to Quicken software as it would make it much easier to drill down into the details during future audits.

Program: President Fred Kemmerer - AB1OC, will temporarily be assuming the role of Programs Director during John Keslo - W1MBG’s absence due to his illness. The projected schedule is as follows:

- February - “Introduction to DMR Radio – New mode for Amateur Radio” by Bill Barber – NE1B
- March - “Buddipole in the Field” or “The 100 lb DXpedition” by Scott Andersen, NE1RD
- April – a New Dale Clement - AF1T presentation in May on Antennas
- May – “Linux in the Shack” by Andrew Stewart , KB1OIQ
- June / July - Field Day planning / Field Day results by Charles Burrill - KC1ECE

NPOTA: Aron Insinga W1AKI discussed the ARRL 2016 National Parks On The Air (NPOTA) event and potential park selections for the Nashua ARC. The survey that we did of the members indicated solid interest in such an event, with about 14 people responding in the affirmative and roughly half indicating that they would be interested in helping with the event. A New Hampshire National Park is preferred and the suggested best time would likely be a weekend Saturday between Memorial Day and the end of July.

Concerns about Memorial Day traffic, Field Day schedule, 13 Colonies special event operations and member’s vacation schedules will all have an influence on the Clubs target date and operating schedule. Anita, AB1QB volunteered to help Aron with a calendar of possible conflicts to assist in selecting final dates.

(continued)
Elmer: Webmaster Bill Hammond - KA1SSR, discussed an Elmer e-mail reflector that he created. Bill will post a signup list for additional Elmer volunteers to provide a wider range of skills and operating experiences. Needed Elmer skill sets vary, from setting up a simple antenna, helping someone get on the air for the first time, equipment selection, help with new operating modes: PSK31, RTTY, satellite radio, etc.

Activities: Director Anita Kemmerer - AB1QB, discussed Awards Recognition plans. Award certificates would be provided to show our appreciation to our meeting guest speakers.

Web: We discussed our increased “web presence” thanks to the new Facebook, Twitter and Instagram accounts that Treasurer Wayne Wagner - AG1A setup. Fred also will cross post his Station Blog to Facebook which should help increase interest in our club. Our first Tech Night video was posted in uploaded and posted in High Resolution to Fred AB1OC’s Vimeo account.

Newsletter: Kristina White - KC1EMH will be taking over the club’s newsletter. The new newsletter format will favor online newsletter distribution on the club’s website and may include hyperlinks and can support longer articles and color images. The new newsletter may include articles highlighting some of our member stations and radio interests, experiences or accomplishments.

Training: Anita – AB1QB indicated that a new round of Amateur Radio Licensing classes will be starting in the spring and the latest class schedule has been posted on the Clubs website.

Field Day: Wasserman Park was judged not suitable for this year’s Field Day as the site is being upgraded to include the addition of a new Dog Park. New suggestions for alternative locations are needed. The Hollis school soccer field used for the WRTC 2014 site was suggested.

ARRL: Fred - AB1OC, Wayne – AG1A, and Anita – AB1QB, attended the ARRL New England Cabinet meeting held on January 9th at the Springfield Sheraton Hotel. Fred reported that the ARRL meeting locations are moved around to allow more participation by New England Amateurs. The next meeting is scheduled to be located in the Nashua region. Fred provided a summary of some of the types of topics discussed at a meeting:

- Lots of FCC inputs and band segment ideas and comments.
- Expand Tech License privileges to include more HF exposure and encourage upgrade.
- Expand digital band segment frequency bounds in selected bands.
- Support for Senate Bill HR 1301: Amateur Radio Parity Act

Adjournment: Having no further business the Board of Directors meeting broke up at 9:45 PM. The next Board meeting is February 23rd at 7:00 PM at the Dunking Donuts community conference room at 239 Main Dunstable Rd. in Nashua (exit 5). Board meetings are always held on the 4th Tuesday of the month and are always open to any interested members.
Board Meetings
Tuesdays, January 26, 2016 and February 23, 2016
Dunkin Donuts, 239 Main Dunstable, Nashua NH
7:00 PM (open to all members)

Weekly Sunday Net  Net Control: Mike, K1WVO
6 Meter Net: Second and last Sun – 9 PM – 50.18 MHz USB
10 Meter Net: 1st and 3rd Sun – 9 PM – 28.480 MHz USB

Pizza!
Thursdays 6:15 PM, Various Locations, check 147.045
Saturday Breakfast: 7:00 AM at Joey’s Diner
Craftsman’s Lane, off Route 101A, Amherst

Treasurer Wayne AG1A provided a brief summary of club revenue and expenses as of 2/1/2016.

Income
Donation Tech Class Projects    $ 800.00
Membership Badges              $ 35.00
Membership Dues
Regular                     $ 20.00
Senior or Student           $ 15.00
Refreshment Donations       $ 47.00
Total Income                 $ 917.00

Expenses
Club Member Badges           $ 67.95
Club News Letter             $ 33.70
Postage                      $ 19.47
Printing                     $ 47.98
Club Refreshments            $ 200.00
Promotional Materials        $ 35.55
Total Paid Out               $ 404.65
Overall Paid Out             $ 512.35

Bank Accounts
Commercial Checking #1  $3,975.95
Commercial Checking #2   $ 107.57
Total Bank Accounts       $4,083.52

Cash Accounts
Petty Cash                  $ 28.50
Total Cash Accounts         $ 28.50
Overall Total               $ 4,112.02
At Nashua Area Radio Club, We Love New Hams!

American Radio Relay League (ARRL): [www.ARRL.org](http://www.ARRL.org)

[WHAT IS HAM RADIO?](http://www.arrl.org/what-is-ham-radio)

[GETTING LICENSED](http://www.arrl.org/getting-licensed)

[FINDING A CLASS](http://www.arrl.org/find-an-amateur-radio-license-class)

NARC meetings are accessible for the physically challenged

Hillsborough County ARES Training Nets

[http://www.k1hil.org](http://www.k1hil.org)

Every Monday – Voice net per the schedule found on the NCS tab at [www.k1hil.org](http://www.k1hil.org) followed by a FLdigi digital net.

New Hampshire ARES HF Training Net

Saturdays – 8:30 AM 3.945 MHz +/- LSB

Nashua Area Radio Club’s Bulletin is published monthly by the Nashua Area Radio Club, Inc. in and limited Greyscale hard copies. Distribution is made just prior to its monthly meeting and distributed free to members and friends of Amateur Radio.

WE NEED SUBMISSIONS! The deadline for submitting articles and/or photographs for the next issue is the 20th of the Month prior to the next issue. Electronic submissions are preferred and should be sent via electronic mail to [Chazb1027@msn.com](mailto:Chazb1027@msn.com). Images are accepted in any standard file format. Material for publication may also be sent to the Nashua Area Radio Club, PO Box 248, Nashua, NH 03061.

Advertising inquiries should be addressed to the above mailing address or by contacting any Board Member.

Participation is paramount in a successful club!
# Nashua Area Radio Club Official Membership Application

## New Applicants and Renewals

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<tr>
<th></th>
<th>Regular</th>
<th>Student/Senior over 65</th>
<th>Family</th>
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<td>$15.00</td>
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Name_____________________________ Callsign_____________________________ Class__________________________

Address_________________________________ City__________________________ State___________ ZIP____________

Phone ________________ Work Phone _______________ Email Address_____________________________________

Monthly Bulletins are sent via EMAIL [opt-in for USPS] ARRL Member yes no Expiration Date_________________

Additional Family Member(s) Call sign /Name__________________ ARRL Member yes no Expiration Date____________

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Make Checks Payable to ‘The Nashua Area Radio Club. Mail Check and application to:

**Membership, Nashua Area Radio Club, PO Box 248, Nashua, NH 03061-0248**

In signing the application, I hereby apply for membership in the Nashua Area Radio Club, and agree to abide by its constitution and by-laws.

_________________________________________________ date_________________

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Nashua ARC Website QR Code

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Nashua, N.H. 03061

Po Box 248

Nashua Area Radio Club