Polk County Amateur Radio Association
1732 Forest Circle
Balsam Lake, WI 54810
www.N9XH.org

Minutes of the Special Club Meeting to Discuss the Status of the ARC Antenna Project

Held: 7:30 PM Monday, January 15, 2018 in the Justice Center's Multi-Purpose Room

Attendance: Chris KC9NVV, Tom N0HWY, Gale WD9HFT, Russ WQ0N, Jon KC9PJG, Steve KD9FSQ, Greg N9CHA, Kelly N9HBN

- The meeting was called to order at 7:30 by club president, Chris KC9NVV
- Russ WQ0N confirmed that the meeting was announced via email to the Yahoo group and that all club members were invited to attend. The email invitation included the following agenda for the meeting:
    - the history of the project
    - the current status of any understanding between the club and the ARC
    - the current status of the tower and adjacent structures
    - thoughts and plans for utilizing the tower
    - identifying a point person to maintain a plan/schedule and to coordinate club members
- Russ WQ0N presented a chronology of documents pertaining to the site dating back to January 2012.
- Chris KC9NVV and Greg N9CHA shared the history of the site and the club's interest in the site.
    - It is an old tower built by the military and is now owned by the ARC.
    - Chris KC9NVV has established, and has maintained, a good relationship with the director of the ARC and reported that the director has been very amenable to allowing the club to use and have access to the tower and adjacent building.
    - The vision of using the tower has evolved over time, but has always been considered an alternative or adjunct to the current club tower in Balsam Lake.
    - Initial use of the tower in 2013 was an APRS DIGI
    - On roughly an annual basis, the club has sent a letter to the ARC director briefly describing the club's emergency communications commitment and purpose along with the benefit of using the tower and a list of club members that may (from time to time) be at the tower or the adjacent building. The club has also donated $25 to the ARC as a small gesture of good will.
    - The potential importance of the tower increased in late 2015 when concerns were raised about the stability of the existing club tower in Balsam Lake.
    - Greg has modeled coverage patterns from both the ARC tower (assuming an omni-directional and a directional antenna) and the Balsam Lake tower.
    - In mid 2017 there was discussion at club meetings to install an antenna on the tower to serve as a receive site. For several reasons, the activity did not progress and some (but insufficient) funds were received for the purchase of the antenna. Chris KC9NVV offered the money can be returned to donors, if they request, since the antenna was not purchased.
    - In late 2017, AirComm (a small two0way communications company in the area) was given permission by the ARC to place a couple antennas (attached to side-arms) on the tower for use in the 440 and 900 MHz business bands
    - Also in late 2017, AirComm cleaned-up the tower by removing several old and

unnecessary items. This likely reduced the efforts the club will need to make in the future. AirComm also has some equipment mounted in the building next to the tower.

- There is no formal written memorandum of understanding between the ARC and the PCARA, but the relationship is positive and Chris is very comfortable that no formal relationship is necessary.
- The ARC has talked with Chris KC9NVV and assured him that the ARC is committed to allowing the PCARA continued use of the tower and would ask AirComm to make changes, if their equipment interfered with PCARA needs.
- Gale WD9HFT, Chris KC9NVV and Greg N9CHA presented considerable discussion of the current status of the tower.
    - Gale showed several photos of the tower and surrounding structures
    - There is currently no visible ground on the tower.
    - Greg took considerable high resolution photos of the tower to inspect various connectors and sections. He is not an expert, but the tower appears to be in good condition.
    - The building adjacent to the tower is un-conditioned and not insulated but weatherproof
    - There is electrical power to the building, but the distribution panel is not clean.
    - There is a propane tank near the tower that could pose a risk until the tower is adequately grounded
    - High speed optical fiber internet is expected in the area in summer 2018.
- Greg prepared a statement of work to provide a tower climber regarding possible immediate and future use of the tower. That document is attached to these minutes.
- There was discussion regarding possible future use of the site and the tower.
    - A possible remote antenna for HF
    - A receive site for the VHF and UHF repeater, giving better coverage in the river valley
    - A replacement site for the club repeater
- There was also considerable discussion of site improvements, beyond installation of antennas and feed-lines on the tower.
    - Build-out of a lockable room on the second floor of the adjacent building, for the radio equipment, to allow for insulation and possible air conditioning to manage summer heat.
    - Electrical power distribution from the access panel on the building
    - Proper access for feed lines from the tower to the building.
    - Donating and installing a lighted religious symbol on the tower (specified by the ARC) with proper power and other control lines as necessary – as a small thank you gesture.
- Everyone in the meeting was upbeat and positive about the opportunity of utilizing the ARC tower
- Chris reminded the group that the club has always been supportive of the activity at the ARC tower as long as no club funds were involved.
- Everyone in the room indicated interest in continued involvement in t the project.
- Gale WD9HFT volunteered to lead a renewed effort to move the project forward with commitments of time and talent (and potentially financial) from others in the room.
    - Everyone was supportive and appreciative of Gale's willingness to lead the project
    - Gale will take a few weeks to continue to learn more about the project and existing information and will report to the group when he is ready to ask for input to a project plan.
    - Gale and the group will keep the full club informed at monthly meetings as it proceeds
- The meeting was adjourned at 9:15 PM

Respectfully submitted by Russ WQ0N, PCARA Secretary

Attachments:
1) List of document relating to the ARC tower
2) Scope of work document prepared by Greg N9CHA

ARC Antenna Project History

This table, compiled by Russ WQ0N on 1/15/18, lists all the PCARA documents he could locate that included reference to the ARC tower and tower project.

#	Date	Document Type	Content Description
1	1/17/12	Letter to ARC	From: PCARA President Rick W9WS Describe PCARA use of the tower for EC and commitment to maintain the PCARA equipment
2	1/21/12	Letter to ARC	From: PCARA President Rick W9WS Description of the PCARAs intended use of the tower, further identifying the individuals that will be accessing the tower and that they assume personal liability for their actions
3	12/17/12		From: PCARA President Rick W9WS Request to use the tower and to evaluate the tower and to submit a plan to use the site. Acknowledging no ability to pay.
4	12/18/12	Letter to ARC	From: PCARA President Rick W9WS Describing the benefit of using the ARC tower in support of the mission of the PCARA
5	1/17/13	Detailed PCARA Repeater Maintenance Log	Installed APRS DIGI at the ARC site
6	7/7/13	Detailed PCARA Repeater Maintenance Log	Greg N9CHA and Chris KC9NVV worked on the APRS DIGI at the ARC site. Reported the equipment was in good condition.
7	1/11/14	Club Meeting minutes	Chris KC9NVV requested a donation to the ARC for hosting the APRS DIGI. Motion approved (no indication of the $)
8	1/10/15	Club Meeting minutes	Reference to an ARC memo that described the “Annual operating agreement between the ARC and the PCARA.” A $25 donation and signed agreement letter would be submitted to the ARC. Motion approved.
9	1/10/15	Letter to ARC	From: PCARA President Rick W9WS A repeat of the 1/21/12 letter that further identified the individuals that will be accessing the tower and that they assume personal liability for their actions
10	2/14/15	Club Meeting minutes	In “Old Business” is an entry that the “ARC Memo was signed and delivered with a $25 check.”
11	1/22/16	Letter to ARC	From: PCARA President Mark W9GWG Another repeat of the 1/21/12 letter that further identified the individuals that will be accessing the tower and that they assume personal liability for their actions
12	3/16/16	Board Meeting minutes	Discussed developing a second VHF/UHF repeater site at ARC. Bill K9WEN and Chris KC9NVV are to survey the current site, draw-up engineering plan, submit plan to ARC, secure permission from ARC, summarize for the club. Greg to submit frequency coordination application to WAR. Greg will develop requirements and outline equipment needs for the ARC installation
13	4/9/16	Club Meeting minutes	Discussion of the new (redundant) repeater site at the ARC. Motion to create plans and apply for frequency coordination, not a commitment of funds or to complete the project. Motion approved.

#	Date	Document Type	Content Description
14	11/9/16	Board Meeting minutes	Clarification needed from the WAR chairman, Chris Tarr, regarding the ARC As a means to mitigate the impact of the loss of the Balsam Lake tower (due to failure or other reasons), the ARC site is being considered. Engineering site plan needed along with a revised MOU between the PCARA and ARC
15	6/10/17	Club Meeting minutes	Greg N9CHA updated the club that a tower climb was canceled, due to possible ACR tower improvements. The climb will be rescheduled and Greg asked authorization of up to $250 for the climb. Motion approved. The discussion also included future loss of the TF link in the next year or two (when Bill K9WEN retires) and an additional link site in the northern part of the county. A further discussion including procuring a 2 m beam for the ARC site with donations requested.
16	7/8/17	Club Meeting minutes	Discussion regarding the ARC tower site included: the need for new grounding with rods and cabling, a plan for a club outing to the ARC site for cleanup and prep. Greg reported the climb could/should include removing removal of old stuff from the tower. The antenna fund has $180 in it. Rick W9WS reported a new antenna would cost about $1,000. Greg indicated an M2 might work, if waterproofed.
17	7/10/17	Scope of Work document	A multi-step project plan, prepared by Greg N9CHA describing the proposed ARC tower project from removing old items on the tower to installing new transmission lines to installing new antennas.

Scope of Work – N9XH Remote South – July 10, 2017

Location: ARC Tower Site: 45.251675 -92.646103 2.2 miles East on 30th Ave. of East Farmington

Tower Construction: Angle iron, cross braced with guys
Tower Height: 110' with anti-torque cage at top.
Tower History: Former cold-war radar site, ray-dome removed many years ago, abandoned by USAF

Step 1 – Remove all existing antennas, feed lines, clamps, side arms, miscellaneous hardware.

Tower climber will need appropriate safety climbing equipment and tools necessary to remove existing antennas, including winch and rope. The antennas are to be scrapped by N9XH club members. They are of the Station Master design once used for commercial 2-way hi-band VHF. Other items to be removed include extension cords, religious star apparatus, TV RO antenna, several coax lines. We wish to re-use the ½" Heliax if possible. We need to salvage as much of the hot-dipped galvanized mounting hardware as possible. Leave the side-arm that is about 25' off the ground as we will mount a UHF ground plane to it.

Step 2 – Install ~30 coax hangers (~3 feet) to accommodate snap-ins for 2x 7/8" and 2x ½" Heliax.

Currently there are no coax hangers on the tower. Universal T-Bracket T600 or equivalent. The club will procure the brackets and snap-ins.

Step 3 – Hoist 2x 7/8" and 2x ½" Heliax to top and 1x LMR-400 to 25'

Terminate and hoist 4 coax cables. Use snap-ins to secure to tower. Use ground kits at the top, 60', and 15' points on tower. All cables to be terminated to N connectors, female at top of tower.

Step 4 – Hoist and install a religious cross or star

The ARC is currently a religious retreat center. The tower owner would like to have a cross or star installed along with associated power. 1" PVC swaged electrical conduit to be installed to a tower leg using tie straps.

Step 5 – Hoist and install VHF, UHF Antennas

There are currently 5 antennas to be mounted.

1) VHF 4-bay dipole at top
2) M^2 5 element VHF beam at top, heading 15 degrees
3) 7 element UHF beam near top, heading 35 degrees
3) UHF 4-bay dipole at top
4) UHF ground plane on side arm at 25'