K2BSA Amateur Radio Operation
2013 Jamboree, The Summit

Version 9.1

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Vision

This section provides the overall vision for the K2BSA Amateur Radio Operation at the Summit in West Virginia for the 2013 Jamboree. The rest of this document goes into more detail around action planning.

History

Amateur radio has been a part of the Jamboree experience since at least 1953 when K6BSA was in operation from Irvine Ranch in California. This was followed by K3BSA in 1957 and 1964 at Valley Forge, KØBSA in 1960 from Colorado Springs, K7WSJ at the 1967 World Scout Jamboree in Idaho, KF7BSA in 1969 from Idaho, and KJ3BSA in Moraine State Park and KJ7BSA in Idaho for the 1973 Jamboree.

K2BSA was established as the amateur radio station for the National Office of the BSA in 1971 at the North Brunswick, New Jersey location. It has been in operation at every Jamboree since 1977. It has made numerous contacts around the world during each Jamboree and at many other events including the annual Jamboree on the Air. It is looking forward to establishing permanent installations at the Summit in West Virginia. More information about K2BSA and about the history of amateur radio at the Jamboree can be found at http://www.k2bsa.net

Purpose

Introduce the science, technology, and fun of amateur radio operation to Scouts and Scout leaders. Facilitate earning the Radio Merit Badge. Serve as the amateur radio voice of the Jamboree via two-way radio contacts within the Summit and worldwide.

Goals

- Provide Scouts exposure to amateur radio, explain what it is, how it is relevant to them, and provide an opportunity to try as many aspects of the hobby as possible within the constraints of the Jamboree. Provide demonstrations to at least 4,000 Jamboree participants, including HF SSB and PSK as well as VHF/UHF FM.
- Provide Radio Merit Badge training, counseling, and activities sufficient to allow a Scout to earn the badge within a four-hour time commitment. Target 400 badges earned.
- Provide outdoor, high energy ARDF—Foxhunting training and activities.
- Provide FCC Amateur Radio License testing services, as needed.
- Provide an alternative communications mechanism to Jamboree participants and staff.
- Provide exposure to the Jamboree to radio amateurs around the USA and around the world.

Activities Overview

Now that we've established the vision, the purpose and goals, our next step is to establish key activities to support the achievement of the purpose and the fulfillment of the goals. Here's the broad range of activities that will be in operation during the Jamboree.

Demonstration Station

Provide amateur radio demonstrations that energize Scouts in communicating with others around the country and around the world. Use communication modes that resonate with Scouts such as PSK digital modes that mimic their favorite mode of communication --- texting.

- Provide simple, intuitive amateur radio transceivers that Scouts can directly operate with minimal guidance --- setups where they will say "I can do this at home!"
- Standardize the demonstrations using outlines and hand-held flip-books to present concepts and demonstrate operation. Every Scout gets time in front of the transceiver making contacts with other Scouts and amateur radio operators around the world.
- Optimize operational flexibility by standardizing around the same set up for every station that can demonstrate digital modes (PSK) and phone modes (SSB). Allow flexibility of stations operating across all bands to allow them to move where the propagation dictates in order to maximize time on air communicating with other stations and, ideally, other Scouts.
- Provide one fully capable station with directional antenna to be used in offering Jamboree amateur radio contacts to stations around the world to satisfy that demand and to set-up/stage other stations to communicate with the demonstration stations.

Radio Merit Badge

Facilitate earning the Radio Merit Badge via onsite training and testing, providing Scouts with a visible goal to achieve that not only introduces amateur radio but provides them a merit badge as part of their advancement program. Do this within a relatively low-impact time commitment of no more than four hours.

- Highly interactive and engaging classroom presentations sandwiched around on-the-air activities at the nearby demonstration station. Example, time in class to focus on requirements that directly support radio operation, followed by time in the station applying those skills, ending with the remaining time in class working to complete all the merit badge requirements.
- Training sessions that start every hour on the hour to minimize delay for the Scouts that walk up with a general interest in amateur radio and can commit to spending the next four hours earning the Radio Merit Badge.

ARDF --- Foxhunting

ARDF stands for Amateur Radio Direction Finding. Foxhunting refers to using ARDF to find hidden transmitters. This activity is ideal for the high adventure focus of the Summit. It gets Scouts on a trail using amateur radio and direction finding techniques, expanding their orienteering skills, and involving them in yet another aspect of amateur radio and technology.

- Provide introductory training on the use of standard, simple, ARDF equipment and antennas in finding hidden transmitters.
- Operate an ARDF course with successive levels of challenges that provide early success yet encourage the development of skills on more challenging tasks.
- Offer walk-up availability to the training and use of the course.
- Stage competitions on a periodic basis throughout the Jamboree to foster competition and generate interest in amateur radio and technology.

Special Events

We have scheduled many special events that will be of keen interest to the Scouts as well as local and national media. These include:

- International Space Station contact has been approved for the week of July 15. Exact day and time is pending the ISS schedule.
- Near space balloon launches with monitoring via amateur radio is scheduled for July 18, 20, and 23.
- Contacts via low-Earth-orbit amateur radio satellites will be offered as orbital paths/timing allows.

VHF-UHF Repeaters

VHF/UHF FM repeater installations will include staff and other licensed operators to fully cover the Jamboree area. This will facilitate networking as well as emergency communication.

- Permanent installation of VHF FM (146 MHz) and UHF FM (440 MHz) as well as UHF D-Star (440 MHz) amateur radio repeaters that can support communication throughout the Summit property via hand-held transceivers.
- Active Internet connection to the repeaters for control purposes and to facilitate D-Star and EchoLink communication around the world.
- On-going 365/24/7 operation in support of other Summit events as well as the local amateur radio community.
- APRS (Automatic Packet Reporting System) will be in operation from the K2BSA demonstration station with an iGate. D-PRS will also be in operation from the UHF D-Star repeater.

Demonstration Station

The 2013 Jamboree K2BSA demonstration station has a primary focus on introducing the fundamentals of amateur radio to the highest number of Scouts possible consistent with the goal of providing a quality experience within the overall operation of the Jamboree. Our goals are ambitious --- introduce amateur radio to 10% of the Scouts at the National Scout Jamboree. That is expected to be 4,000 youth over the course of roughly eight days.

Our thought is that the magic of amateur radio is reaching out and communicating over both short and long distances via radio. Further, that communication is optimally via voice and digital modes, with the latter in harmony with how so many of our Scouts communicate with each other, via text messaging. Given this premise, along with the focus on hands-on demonstrations to 4,000 or more, our plan is to deliver a consistent, high-quality, demonstration with those two modes at the core of the experience.

Approach for Youth/Jamboree participants

> *Make using ham radio fun, using a number of methods of demonstration and learning, and provide it in a context that is relevant to the youth, while maintaining the heritage and history that made ham radio what it is today.*

Station Overview

The Demonstration Station will be composed of multiple operating positions offering a variety of modes to the participants. These include:

- Four IC-7200 stations, offering phone and digital modes on HF
- Two IC-9100 stations, offering phone, and digital modes on VHF/UHF/HF and the potential for satellite/ISS communications when the opportunities arise
- Two IC-2820 stations for VHF/UHF repeater and D-STAR communications
- One IC-7600 station with directional antenna

Each station will have the ability to host four participants at a time, plus one control operator (K2BSA staff member / aka Guide).   The goal is to give each participant about 8-10 minutes of operating time.

Operation Hours

The demonstration station will maintain 24x7 operations, with the majority of activity occurring when the Jamboree participants and visitors are able to visit areas in Summit Center, which is mostly from 8 AM to 8 PM daily (visitors 10 AM to 5 PM). During those times, all the stations will be active providing demonstrations.

From 8 PM to midnight, the station will be available for schedules, one-on-one time, and for Jamboree participants who hold amateur radio licenses and wish to operate K2BSA. Times available and duration of operation will be dictated by demand.

From midnight to 7 AM daily, the station will be operated by K2BSA staff to provide QSO opportunities to amateur radio operators not in attendance who desire to complete a QSO with our station at the inaugural Jamboree held at the Summit. There will be a schedule posted of

operators who will man the station for the night time hours, and this will rotate among the staff as needed.

Demonstration Flow

The general flow of the station will be fairly standardized, and a script provided to each guide outlining points to cover while the participants are visiting the station. The outline is:

- Greet all those who arrive, and break them into small groups of up to four each.
- Take them through the entry area, providing a brief history of amateur radio, and how it has changed and stayed current over the years. Visuals will be available.
- Provide them a short introduction to Morse code, and allow them to try it on a set of oscillators with Morse sheets. Ask them to send each other's names. Outline that Morse Code (CW) is still an active part of amateur radio, but not a requirement for licensing as it was in the past.
- Stop briefly at each exhibit in the entry area, and give a brief explanation of what they see. These will include a live APRS map, etc. The types of visuals are still being finalized.

After passing the entry area, the participants will enter the demonstration area. Each station can accommodate four participants. During 8 AM to 8 PM, the station is for demonstrations only unless some stations are inactive. Skeds, etc. should be accommodated after 8 PM. The shift supervisor will resolve any questions.

Operators while at the radio controls of each station type will operate under the same basic guidelines:

- Give a brief description of the radio and modes available
- Describe the correct procedures and topics for talking on the air
- Allow each participant to use either voice or digital modes (with a preference to show both)
- Allow the participants to ask questions as they progress.
- Keep the time per participant to 8-10 minutes unless the participant queue is light (no one waiting).
- Log all QSOs, including participant, station, control operator, time, date, mode, station ID
- As much as possible, use JOTA/Scouting recommended frequencies.
- Use all possible modes available. These can include phone, PSK, RTTY, SSTV, Morse, etc.
- The venue will likely be noisy. Use headphones or keep the station AF gain (volume) down as much as possible. Keep voice levels to normal talking volume.
- Adjust the microphone gain and ALC with each new participant and limit the use of compression.

Station Operation Specifics

For each specific station type, there will be variations to operating:

HF (IC-7200 or IC-9100s)

- Keep the station on the assigned band unless a change is required to limit interference to the other stations. Confirm changes with shift supervisor
- Use the tuner if needed. Monitor SWR periodically.
- There will likely be pileups.   Allow the participants rag-chew QSOs as much as possible. During demonstrations, talk time is to be emphasized over giving out QSOs. The IC-7600 directional antenna station is for handing out high volume QSO counts.
- Discuss the general station conditions if asked (antennas, etc.)

IC-2820 (VHF/UHF/D-STAR)

- This station is mostly for repeater operation. Most QSOs will be with other staff or Jamboree participants, or via ECHOLINK or D-STAR, and can be with the other VHF/UHF/D-STAR stations in the venue (both repeater and simplex).
- Switch from analog to D-STAR to show the audio differences. Explain why.
- Show the ability to send packet data when possible
- These stations will be utilized during the nightly nets and during other times as needed by K2BSA staff if requested by Jamboree management. Adjust the demonstrations according to the shift supervisor.

IC-9100 (satellite operation)

- When ISS or other satellite windows present themselves, these stations will be requested to cease normal HF demonstrations so they can accommodate these passes.
- These times are well known and will be posted. If there are questions, see the shift supervisor.
- These passes will most likely be an event, and the station will likely be moved outside, weather permitting, with audio provided so the maximum number of people can see and hear.
- A form of selection process (drawing, etc., to be determined) will be used for those participants who will be able to participate in these contacts.
- A discussion prior to and after the window will be offered to explain how these contacts work and how they are different then the ones conducted inside the venue (doppler-effect, apogee/perigee, pass prediction, why the antenna moves the entire time of the contact, etc.).

IC-7600 Station with Directional Antenna

- This station will be used in two ways:
    1. Primarily for Radio Merit Badge participants who need to complete their on-the-air requirement. This will mostly be during demonstration time.
    2. To provide QSOs from K2BSA to the amateur community at large (maximum QSOs). This is expected to occur later in the evening after the primary demonstration activity closes
- This station is the only one with a rotatable beam. A schedule of areas in the world and propagation maps will be provided nightly. These may change by region of the world daily to provide as many opportunities for hams in different regions of the world to make a QSO.
- DXpedition pile-up techniques may be needed at times (by district, region of the world, split operations, etc.). Plan accordingly. Training will be provided for those who need it, or want to practice their technique.

Special Operations

These operations will be events, and will be scheduled and advertised on-site as much as possible to ensure the maximum participants.

These can include (but not yet finalized) balloon launches, distinguished operators, ISS (see satellite), and potentially others.

QSL Cards

The final courtesy

- All logs will be uploaded daily to Logbook of the World and ClubLog.
- For those on-site who make a QSO, a QSL will be provided on a walk up basis
- QSL manager duties will be performed if card requests arrive on site. The ARRL will be providing QSL bureau service at no cost for all cards sent outside the USA. Unfortunately, domestic cards not only swamp the QSL bureaus but few hams have envelopes on file with the bureau, so the cards eventually get tossed. Another option for issuing cards will need to be determined. Or, we'll wait for requests. This works well in light of the daily uploads to Logbook of the World.
- For station participants, a QSO certificate with QSOs made will be given to each person as they leave the venue

Extend an invitation to all who attend to come back later after 8 PM, with the permission of their Scoutmasters, if they have further interest or wish to make other contacts outside of the demonstration timeframes. This needs to be reviewed in light of the access restriction to the Summit Center after 8 PM.

Finally, provide a reminder of the other areas of K2BSA including ARDF, Radio Merit Badge, ISS contact, and other ad-hoc events at the station (balloons, etc.).

QSL Card

QSO Card --- used by all Scouts involved with a demonstration

The card folds and fits in a Scout's pocket.

Station Schedule

	Wednesday	Thursday	Friday	Saturday	Sunday	Monday	Tuesday	Wednesday
	10	11	12	13	14	15	16	17
7:30a		Staff Meeting	Staff Meeting	Staff Meeting	Staff Meeting	Staff Meeting	Staff Meeting	Staff Meeting
8:00a	Leadership Team Arrives	Staff Arrives during this day.	Some Staff Arrive		DX Operations continue	Youth Arrive at Summit	Station Closed	Station Open to Youth for Demos
9:00a	Station Setup	Station Setup	Station Setup	Station Setup		Station Closed		
9:30a							Stadium Show	
10:00a						Final Station preparations		Visitors can arrive
11:00a						Lunch	Lunch	Lunch
12:00p	Lunch	Lunch	Lunch	Lunch	Staff Free-time		Station Open to Youth for Demos	
1:00p		Schedule Review	Demo Station Review	Digital Operations Review				
2:00p		Camp Procedures Review		Fox Hunt Review		Station open to Program Activities		
3:00p		Support Services Review	Intro Area Review					
4:00p		QSL Procedures	V/U/Echolink/IRLP review	RMB Review				
5:00p		Net Operations Review	DX Operations Review	Work schedule Review		Visitors Leave	Visitors Leave	Visitors Leave
6:00p	Dinner	Dinner	Dinner	Dinner	Dinner	Dinner	Dinner	Dinner
7:00p		First Camp-wide Net	ISS/Sat operations Review, Nightly Net,	DX Operations begin, Nightly Net	Nightly Net	Nightly Net	Nightly Net	Nightly Net FCC Exams
8:00p		Staff Operation	Staff Operations	Staff Operations IARU Contest		Program Activities close	Program Activities close	Program Activities close
9:00p								
10:00p						Night Time Operations	Night Time Operations	Night Time Operations

	Thursday	Friday	Saturday	Sunday	Monday	Tuesday	Wednesday	Thursday
	18	19	20	21	22	23	24	25
7:30a	Staff Meeting	Staff Meeting	Staff Meeting	Staff Meeting	Staff Meeting	Staff Meeting	Staff Meeting	
8:00a	Station Open to Youth for Demos	Station Open to Youth for Demos	Station Open to Youth for Demos	Station Closed	Station Open to Youth for Demos	Station Open to Youth for Demos	Scouts Head Home	Final Packing
9:00a				Interfaith Services, Station closed		Balloon Launch	QRT	
9:30a							Station close up and go home	
10:00a	Visitors can arrive	Visitors can arrive	Visitors can arrive		Visitors can arrive			
11:00a	Lunch	Lunch	Lunch					
12:00p				Station Open to Youth for Demos		Closing Activity in Base Camps		
1:00p	Balloon Launch at Summit Stadium		Balloon Launch	Jambo - Palooza		Station Teardown Pack up		
2:00p								
3:00p								
4:00p								
5:00p	Visitors Leave	Visitors Leave	Visitors Leave	Visitors Leave	Visitors Leave			
6:00p	Dinner	Dinner	Dinner	Dinner	Dinner	Dinner		
7:00p	Nightly Net	Nightly Net FCC Exams	Big Stadium Show. Station Closed	Nightly Net	Nightly Net FCC Exams	Nightly Net		
8:00p	Program Activities close	Program Activities close			Program Activities close			
9:00p								
10:00p	Night Time Operations	Night Time Operations	Night Time Operations	Night Time Operations	Night Time Operations	Night Time Operations		

Demonstration Station Layout

The Demonstration Station will be housed in a 40 x 40 tent with wooden floor. An overall layout of the full K2BSA site can be seen in the appendices.
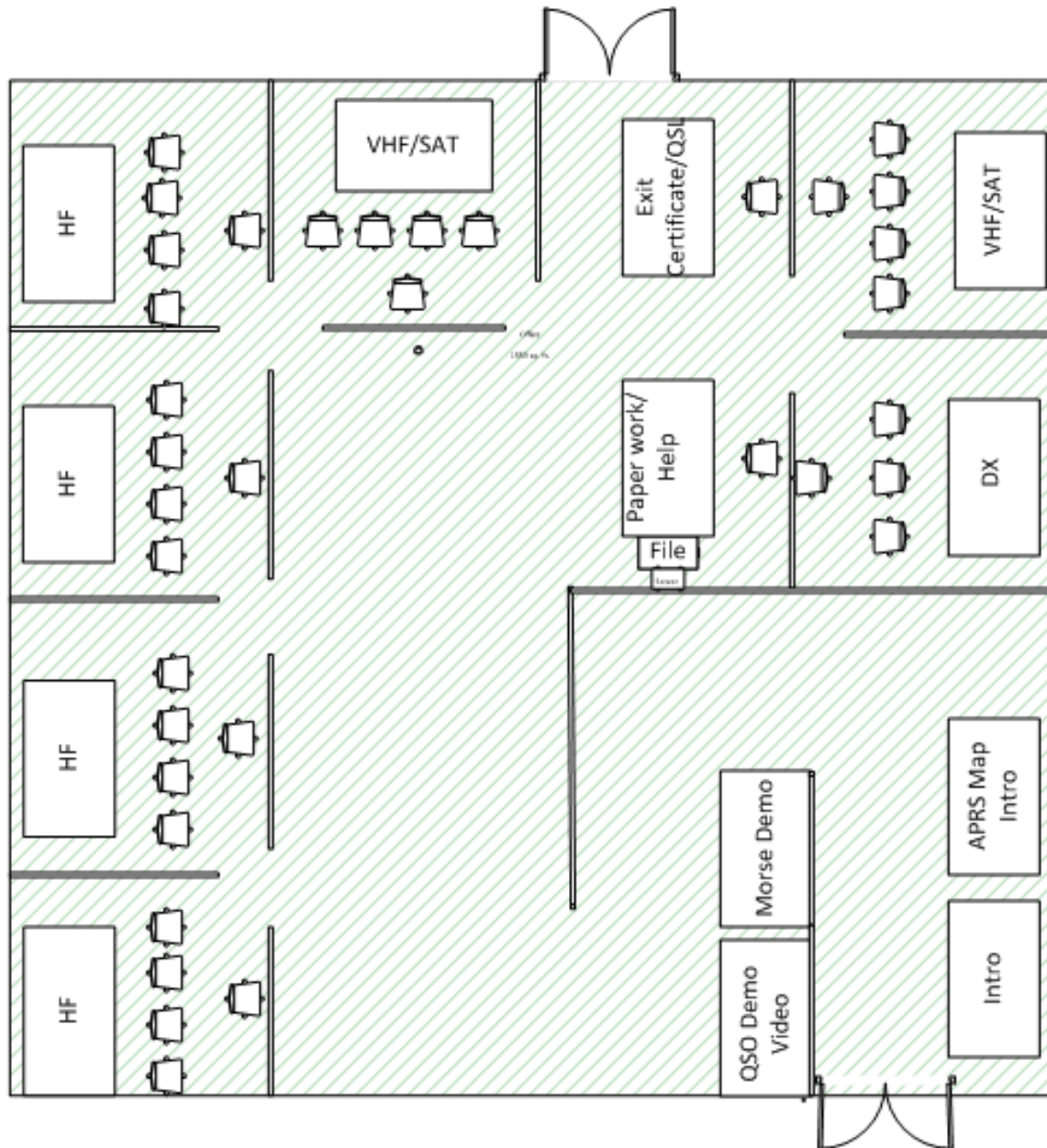
Demonstration Station Roles

The Demonstration Station staff will be organized into three teams. The roles on those teams is outlined below. Teams 1 and 2 will consist of roles designated below, save for the Night Ops, which will be the third team.

The appendices provide an early draft of the recommended shift schedules for Teams 1 and 2. This schedule will allow each staff member time off to rest and to see the rest of the Jamboree.

Station	Role
HF 1 Station	Guide
HF 2 Station	Guide
HF 3 Station	Guide
HF 4 Station	Guide
V/U/SAT 1 Station	Guide
V/U/SAT 2 Station	Guide
QSL Manager	QSL
Shift Supervisor	Supervisor
Net Control	Support
DX Operations	Any
Night Time Ops	Night Ops
Clean Up	All

APRS Operation

K2BSA will set up an APRS iGate at the demonstration station using an Icom IC-2820 transceiver, packet TNC, and computer linked to the Internet. The antenna will be mounted on one of the station telephone poles. This station will be used to support APRS at the Jamboree along with the D-PRS installation at the repeater site.

Radio Merit Badge Program

During K2BSA operations at the Ft. A.P. Hill, VA, 2010 Centennial Jamboree, 332 Scouts started the class for Radio Merit Badge (RMB) and 210 Scouts completed the RMB. With this background, the assumption has been made that the 2013 Jamboree K2BSA RMB Program at the Summit Bechtel Reserve will be designed to handle 400 RMB candidates. Although the program will be planned to handle that nominal number of candidates, the Program will be designed to responsibly process the actual number of RMB candidates that register whether greater than or less than that estimate.

RMB Requirements

There are nine RMB requirements with eighteen sub-requirements. The K2BSA RMB program will only incorporate the optional Amateur Radio element of Requirement 9. The RMB requirements are summarized in Appendix J.

A highlight of the RMB requirements is the opportunity for the candidate to actually operate an amateur radio station including a radio contact with another station. The K2BSA RMB program is designed to provide before the radio contact participation a technical understanding of amateur radio and the equipment used for the contact. This foundation enhances the radio contact experience and is designed to enrich the overall RMB program.

Teaching Segments

The K2BSA RMB program comprises three teaching segments as follows:

- <u>Segment 1</u> – This segment includes the RMB requirements that provide a minimum technical foundation for the individual to understand and appreciate the radio operating experience.
- <u>Segment 2</u> – This segment includes participation in a radio contact under the supervision of a control operator to fulfill that RMB requirement.
- <u>Segment 3</u> – This segment includes all remaining RMB requirements.

Program Planning Assumptions and Requirements

The K2BSA RMB daily operating schedule is illustrated on the chart below.

Class	9:00	9:30	10:00	10:30	11:00	11:30	12:00	12:30	13:00	13:30	14:00	14:30	15:00	15:30	16:00	16:30	17:00
1	A				C												
2			B				D										
3					A				C								
4							B				D						
5									A				C				

- ⬛ (yellow) SEGMENT 1 - TEACHING
- ⬛ (green) SEGMENT 2 - RADIO OPERATION
- ⬛ (red) SEGMENT 3 - TEACHING
- ⬛ (gray) SEGMENT 4 - FLEX TIME AT END

A to D = Instruction Teams

The following are the assumptions and requirements of K2BSA RMB Program:

1. RMB will be taught in three segments as described above.
2. The plan is designed to accommodate 400 RMB candidates.
3. There are eight RMB teaching days; Tuesday, July 16th, through Tuesday, July 23rd.
4. RMB teaching operations will function eight hours each teaching day: 09:00 – 17:00.
5. A total of 64 scheduled teaching hours is available during the Jamboree; there would be many unscheduled hours available if they were needed.
6. The time allotted to teaching segments follows:
   a. Segment 1 – 90 Minutes
   b. Segment 2 – 30 Minutes
   c. Segment 3 – 90 Minutes
      The allotted teaching time is 3.5 hours but we will advertise a 4.0 hour commitment to earn the RMB.
7. Five RMB classes will be taught each day with the following start times:
   a. Class 1 – 09:00
   b. Class 2 – 11:00
   c. Class 3 – 13:00
   d. Class 4 – 10:00
   e. Class 5 – 12:00
      Classes 1 – 3 are primary classes and Classes 4 – 5 will be deemed secondary; candidates will be placed in those classes after the primary classes fill. [If demand were extraordinary, a sixth class period might be inserted at 14:00 although it would limited to three hours or otherwise extend beyond 17:00.]

8. Five classes each day for eight days is 40 classes.
9. 400 RMBs issued would require an average class size of 10 candidates. [This plan is based upon a classroom arrangement comprising three student tables with four chairs at each table to accommodate 12 students.]
10. The three segment teaching plan will hand off 10 – 12 students from Segment 1 teaching to Segment 2 radio operations each day at 10:30, 12:30, and 14:30 from the primary classes and at 11:30 and 13:30 from the secondary classes.
11. The three segment teaching plan requires four Counselors for Segments 1 and 3 with each Counselor teaching 4.5 hours a day. The RMB Program will have eight Counselors and each Counselor will be prepared to teach both Segments 1 and 3.
12. At maximum capacity of five classes per day, the plan requires four classrooms for two one-half hour periods each day, three classrooms for five one-half hour periods, two classrooms for two one-half hour periods, and one classroom for four one-half hour periods.
13. During each eight hour teaching day with four classroom [two in each of two tents], there are 64 one-half hour periods. The RMB teaching plan will utilize 30 of the 64 one-half hour periods for occupancy of a little less that 50%. Thus, if well planned, classroom space will be available for FCC testing or other activities.
14. To accommodate four simultaneous RMB classes, the two tents must each be divided into two classrooms.
15. Each of the four classrooms will have three student tables that have chairs for four students; thus, the classroom accommodates a maximum of 12 students. In addition, the classroom shall have one Counselor table with two chairs.
16. The RMB classrooms require 16 tables and 56 chairs.
17. Registration for the K2BSA RMB Program will be managed by two equally prepared Registrars.
18. The RMB Program will include two Guides that will manage the handoff from Segment 1 teaching to Segment 2 Radio Operations.
19. The RMB Program staff includes a minimum of one leader, eight Counselors, two Registrars, and two Guides.

ARDF --- Foxhunting

The goal of the hidden transmitter hunt will be to offer the Scouts a close approximation of an International IARU sponsored ARDF competition. But it will be conducted more like a practice or training session and will be very informal following only the spirit of IARU competitions and rules.

Draft Rules

As in IARU rules five transmitters will be used. They will be positioned no closer than 400 meters apart, none nearer the start than about 750 meters. Teams will be encouraged to find at least 2 transmitters (controls). Finding more will be at their option and available time. The team name, time out, and time returning will be recorded. Time on the course will be limited to 60 minutes per team.

Teams will consist of at least two Scouts and not more than a patrol (8). This is a BSA buddy system rule not an IARU guideline. Teams can be made up of Leaders, Boy Scouts, Venturing youth or all three.

Teams will start the course at no less than 5 minute intervals. This prevents a "follow the leader" problem. No more than 5 teams will be on the course at any given time. This is a resource limitation (receivers, antennas).

Foxes may be found in any order. We may consider starting each group toward a specific control also to prevent the "follow the leader" problem. Teams will punch their control card at each transmitter to authenticate the find.

A prominent orange and white prism (orienteering flag) is located close to each transmitter for visual identification. This is where the registration device (control punch) is located. A homing fox at the finish line transmits continuously on a separate frequency to aid competitors who might get lost.

Transmitters will transmit once every 5 minutes automatically transmitting one after another (never at the same time) on the same frequency for exactly one minute each.

Equipment

The K2BSA team has determined that 80 meter receivers and beacon transmitters offer the best approach for the Jamboree. The receivers will use a loop antenna. The transmitters will use a wire antenna stung in a nearby tree. The use of 80 meters complies with IARU protocol, which includes both 80 meters and 2 meters in their competitions. The use of 80 meters will also eliminate reflections of transmitted signals that often occur on 2 meters and, thereby, simplify the hunt. It will also offer what should be a unique experience for those Scouts who have previously experienced a 2 meter foxhunt. The equipment is being designed and built by Bill Kelsey, N8ET, of KangaUS.

General Thoughts

Fox hunting is a map and compass exercise as well as a test of direction-finding skill. Successful hunters pay careful attention to their own location and the bearings to all foxes at all times. They know that if they miss a fox bearing, they must wait four minutes to hear that fox again. They also

eye their watches, since exceeding the time limit (60 minutes) means disqualification. In other words, it is better to return under the limit with only one fox found than to find all five but take one minute over the limit. At the end of each day the teams will be listed in order of time taken and number of transmitters found.

Training before heading out to the course will be to teach the use of the radio including how to change the memory channel. This is so they can change to the home beacon if necessary. Using the above scheme I think we can put as many as 35 teams a day on the course. If each team had an average of 4 people, this is 140 or more per day.

The appendices provide an overview of the ARDF team's operating procedures.

License Exams

At previous Jamborees both license classes and testing sessions were offered. However, it is felt that with the emphasis at the Summit Jamboree on outdoor high adventure activities, spending time in a classroom for the day studying for an amateur radio license wouldn't be consistent with the overall Jamboree program. Moreover, results from this effort were not as desired, with 316 taking the test and 143 passing the Technician exam. However, we feel that Scouts and Scout Leaders may well have prepared for the examination prior to the Jamboree, expecting to take the exam for the benefit of adding that accomplishment to their Jamboree experience. For this reason, we will offer testing only.

License exams will be conducted beginning at 7 PM on the evenings noted below. The Radio Merit Badge tent(s) will be reconfigured for the testing session.

- Wednesday, July 17
- Friday, July 19
- Monday, July 22

Should demand for testing prove more or less, we will adjust to accommodate that demand.

There will be no assigned staff members for this task other than our team leader for this area who will coordinate the required materials and direct the VE team, composed of qualified K2BSA staff members. It should be noted that at this point 21 staff members are qualified as Volunteer Examiners.

The ARRL VEC team has provided all the needed materials to support this effort.

High-Altitude Balloon Flights

We have planned three high-altitude balloon flights with amateur radio payloads. These flights are expected to reach 100,000 feet above earth and, thus, qualify as near-space flights. We currently plan flights on the following dates:

- July 18, from the Summit Stadium as part of Airborne Day
- July 20, from the K2BSA Summit Center location
- July 23, also from K2BSA

Tracking for all three flights would be done at the K2BSA Station. Recovery of the balloons would be accomplished by volunteers outside the Jamboree. Payloads will include APRS transmitters, still image cameras, and possibly slow-scan television.

International Space Station

We have a scheduled contact with the International Space Station via the ARISS program. It is presently set for the week of July 15. Actual date and time will be set closer to the event based on the ISS schedule and orbital location.

Ten Scouts will be selected at the Jamboree for the contact. They will use a list of preselected questions. A full public address system has been secured for the K2BSA operation to support this effort. A special antenna trailer is also being provided with Az-El control to track the station overhead during the nine to ten minute contact.

WV8BSA VHF-UHF Repeaters

While the Summit Center will still be under construction after the Jamboree and, therefore, provides no opportunity for the construction/installation of permanent facilities, the VHF/UHF FM repeater installations can be set up within a permanent installation. Icom America will be installing three repeater systems that will remain in place to support Summit operations after the Jamboree as well as to support the local community. The repeaters will be co-located with the commercial two-way system, low-power FM broadcast transmitter, and a cell phone system at the Rock Borrow site on The Summit property.

We will have an Internet connection to the repeaters for control purposes and to facilitate EchoLink communication around the world, as well as D-Star communication. This will allow Scouts and amateur radio operators anywhere in the world to log on to the repeater via the Internet and communicate with Scouts at the Jamboree. It will also allow amateur radio operators at the Jamboree to communicate via the repeater to their home repeaters.

To further facilitate on-going operation of the repeater systems after the Jamboree, the Summit Repeater Association has been formed by local amateur radio operators. This association has further secured the club call sign of WV8BSA for the repeaters. This is a very nice touch for this permanent installation on the Summit.

Coverage map shown here is for the VHF talk in prediction out to 30 km.

The repeaters will also be used to facilitate emergency communication where and when needed.
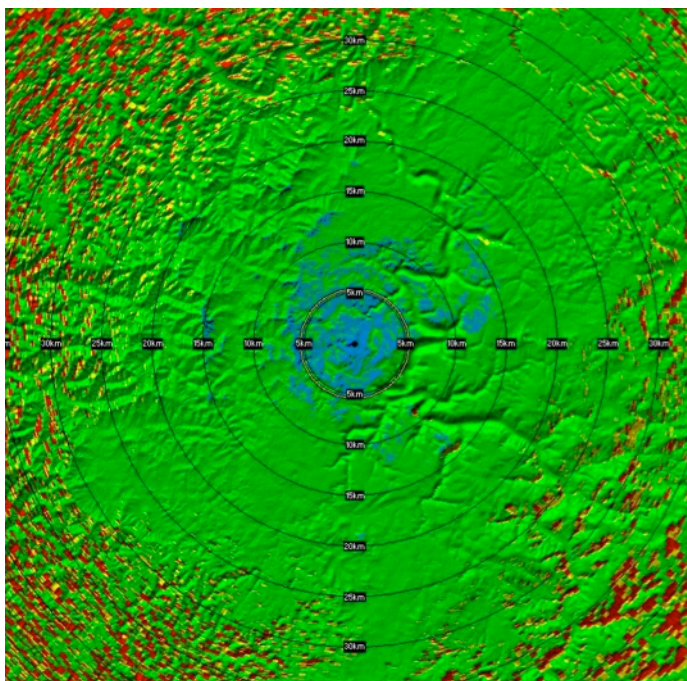
The frequencies and access tones are shown in the nearby table.

Repeater	Input Frequency	Output Frequency	Tone
2 m Analog	146.100 MHz	146.700 MHz	123.0 Hz
70 cm Analog	449.025 MHz	444.025 MHz	123.0 Hz
70 cm D-Star	446.8125 MHz	441.8125 MHz	Not applicable

As noted previously, an APRS transceiver, TNC, and iGate will be operated at the K2BSA demonstration station location. The 70 cm D-Star repeater will have D-PRS.

Media Team

Mark Abramowicz, NT3V, will lead our efforts to publicize the K2BSA Operation on social media channels, news media, websites, and other available outlets. They will take photos and videos to record the activities and to be used in publicity. Media outreach will include Jamboree media as well as amateur radio, local, and national media. Mark is a radio and newspaper journalist and member of the ARRL Public Relations Committee with a great deal of experience capturing and communicating the story of amateur radio to many different audiences.

The Jamboree Photography Team plans to cover the antenna construction, particularly the installation of the direction beam. They also plan to cover the balloon launches and the International Space Station contact.

Facilities

To accomplish the goals and activities listed above, the K2BSA location will require one 40' x 20' and three 20' x 20' tents along with substantial traffic-free areas for antennas. In addition, a nearby, dedicated, ARDF---Foxhunting course will be required. The VHF-UHF repeaters do not have to be located near the K2BSA area. Instead, they can be installed in the most centrally located spot that would facilitate communication across the entire Jamboree footprint. Where possible, all installations will remain in place for future operations at the Summit. For example, the VHF-UHF repeaters will remain for 365/24/7 operation to support the Summit and the local amateur radio community.

The tents will require walls, stable flooring (ideally concrete slabs, asphalt, or plywood secured on planking or some other method to get the floors above ground level), waterproof wiring, Internet connections, grounding systems (electrical and RF), and computer networking. They must be lighted to facilitate station operation and merit badge training at night and during inclement weather. The station will be in operation 24 hours a day.

A diagram of the site layout is shown in the appendices. The large tent will be used for the demonstration station. Two of the smaller tents will be used for Radio Merit Badge training. The other small tent will be used for Foxhunt staging and training, technical support and as a staff meeting and rest area.

The antenna area will need to be next to the large demonstration station tent to facilitate running coaxial cables and rotor control cables. This area will also need to be traffic-free as several vertical antennas will be carrying live radio frequency energy and have radial wires laying on the ground. It should also be secured to prevent Scouts climbing the tower.

K2BSA will also require a nearby ARDF---Foxhunting course that would allow multiple groups to be on the course at the same time locating several foxhunt beacons.

Demonstration Station facility requirements ---

- Four identical demonstration stations with low-cost HF transceivers, simple antennas, computer logging software, PSK digital interface, and large screen computer displays.
- Two VHF-UHF stations for demonstrations and repeater monitoring.
- Two satellite communication systems for low orbit satellite communication and communication with the International Space Station.
- One high power HF station for maximizing worldwide coverage of the Jamboree. High capability HF transceiver, HF power amplifier, tower and directional antennas.
- Networked computer logging and control. Frequent update of Logbook of the World and Club Log to confirm contact with other stations.

Radio Merit Badge facility requirements ---

- Two tents that allow separating the first training segment, which includes record keeping and intake of Scout students, and the second training segment that occurs after the on-the-air experience at the demonstration station.
- Each tent will use one or more large display television screen (LED) for presentation of slides, videos, etc. in lecture format. Whiteboard and flipcharts. Seating in class room format with desk tops or tables for each student and lighting for evening classes.
- Facility is used in the evenings to offer FCC amateur radio license testing.

Equipment

A moderately detailed equipment list is included in the appendix of this document.

Staff

Staffing is currently limited to 50 full-time positions. All will be licensed radio amateurs with substantial involvement in Scouting and, in particular, experience with Radio Scouting activities such as Jamboree on the Air. A key selection criterion will be the ability to work with youth.

Staff members will be needed to build and set up the station as well as take down the station at the end of the Jamboree. Here is our current estimate for staff members and their locations with a total 50 staff positions. Note that some of those full time staff positions will be filled by two individuals --- one person filling the position for the first half of the Jamboree and one person for the second half of the Jamboree. A high-level organization chart is also shown.

Staff Position	Number
Demonstration Station Team Lead and Staff	16 to 20
Radio Merit Badge Team Lead and Instructors	10 to 15
Technical Support Team Lead and Staff	3 to 5
ARDF --- Foxhunting Team Lead and Staff	8
License Exam Lead	1
Media Lead	1
Chairman	1

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            ┌─────────────────────────┐
            │    Chairman  K2BSA       │
            │  Jim  Wilson,  K5ND      │
            └─────────────────────────┘
     ┌─────────────────────┐   ┌─────────────────────────┐
     │ Radio Merit Badge Team│  │ Demonstration Station Team│
     │  Ron  Wood,  K0BRO   │   │  Bill  Bode,  W4WEB      │
     └─────────────────────┘   └─────────────────────────┘
     ┌─────────────────────┐   ┌─────────────────────────┐
     │ ARDF --- Foxhunt Team│   │  Technical Support Team  │
     │  Keith Kaiser, WA0TJT│   │ Russ Mickiewicz, N7QR    │
     └─────────────────────┘   └─────────────────────────┘
     ┌─────────────────────┐   ┌─────────────────────────┐
     │   License  Exam      │   │         Media            │
     │  Alan Braun, NS0B    │   │ Mark Abramowicz, NT3V    │
     └─────────────────────┘   └─────────────────────────┘
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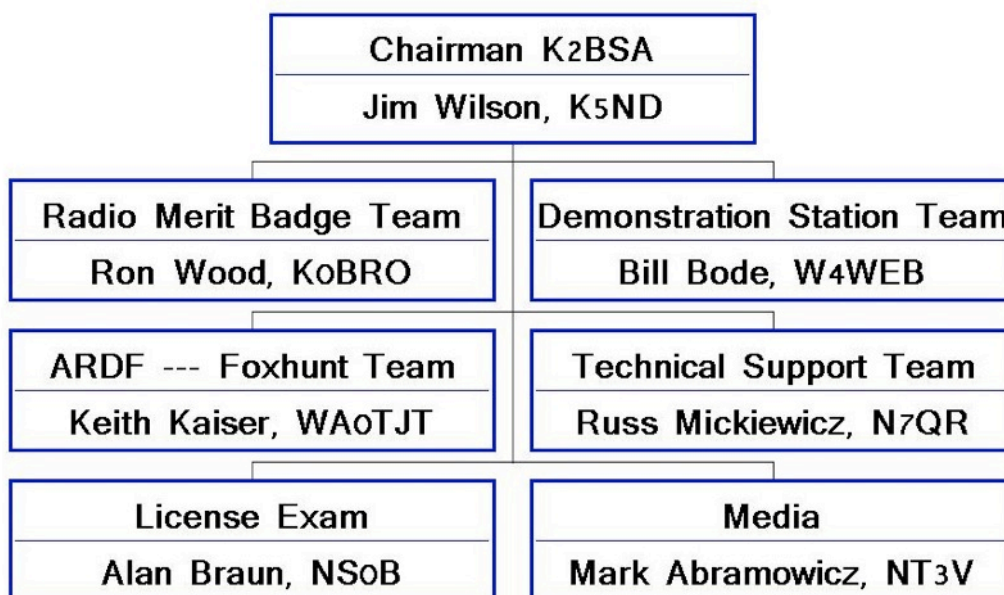
The K2BSA Jamboree Staff Patch is shown above.

Staff members are expected to arrive on July 11 to begin set up and depart on July 24 or 25 depending on their specific assignment. Those signed up for either the first half or second half will arrive/depart on July 18. As noted previously, the station opens on July 15 and closes on July 23.

All staff members have been asked to arrive at the Jamboree with their Amateur Extra Class license in order to maximize flexibility in operating frequency and mode as well as to set a minimum level of expertise. Several staff members who don't currently hold an Amateur Extra Class license have already passed their exams. Additional staff members are in the study process.

Staff will be ordering their own nameplates via the official Jamboree Staff webpage using the three line name plate with the first line their name, second line their call sign, and third line K2BSA Ham Radio.

Patches will be provided to each staff member and two shirt designs were offered for sale: a polo shirt with pocket and a button front short-sleeve fishing shirt. Orders were closed in early April with expected delivery of shirts in mid-May.

As of this writing we currently have 52 registered staff members. See the appendix for the full listing and anticipated staff assignments.

Sponsors & Supporters

Amateur radio equipment is needed for all K2BSA operations cited in this plan, from radio transceivers to antennas and support equipment, including networked computers. It is felt that the Summit offers an opportunity to build a permanent infrastructure that can serve not only the Jamboree but also year-round Summit events and daily operations as well as supporting the local community.

At this time we've reached agreement with Icom America as the exclusive amateur radio transceiver and repeater sponsor for the 2013 Jamboree. As noted earlier, they are providing three repeaters for permanent installation at the Summit. They will also be loaning transceivers and other gear for use in the demonstration station. The full listing of equipment is in the appendices.

SteppIR has agreed to loan several antennas in support of the demonstration station, including a two element beam and several vertical antennas. Here again, the full listing is in the appendices.

Array Solutions has agreed to provide band-pass filters for all bands from 80 meters to 10 meters to allow safe operation of multiple transmitters in the demonstration station. That list is also in the appendices.

The ARDF-Foxhunting equipment is being designed and built by Bill Kelsey, N8ET, of KangaUS under the financial support of a family foundation.

The ARRL is also provided a large number of supporting materials and documents for use in the demonstration station and for our other operations. A complete list is included in the appendices. They are further providing VEC support for our license testing and QSL Bureau services at no charge for cards destined for stations outside the USA.

The tents, chairs, tables, and computers as well as many other items will be provided by Boy Scouts of America. That bill of materials is included in the appendices.

Dayton Drill

The Miami Valley Scout Council in Dayton, Ohio has arranged for the K2BSA Jamboree Operation to reserve their Cricket Holler Harry F. Schiewetz Leadership Training Center for the week of May 13 to May 20, 2013. They have further agreed to accept shipment of amateur radio items from our various sponsors and are working with a local Scouter to provide a trailer for shipment of the K2BSA equipment to the Jamboree.

The center provides training rooms, kitchen, and four sleeping cabins, which also have their own kitchens. The center is located just 3 miles from HARA Arena, the site of the Dayton Hamvention, which is held on May 18, 19, and 20th. This arrangement will allow staff members to fully assemble and test the stations. And if anything is missing, they can pick it up at the nearby Hamvention to complete the station. This will be much easier than trying to acquire some radio items in rural West Virginia or arranging to have it shipped to the Jamboree. This will also provide a motivator for K2BSA staff to attend the staging event, with low cost housing, and a trip to the largest ham convention in the world. We have sold the K2BSA mono-band antennas and old rotators, thereby generated cash for use at the Hamvention in purchasing needed items to complete the station setup.

The cost for the event is being split among the K2BSA staff members that are attending. We have 20 staff members attending which brings the cost to approximately $300 covering the housing (cottages with bunk beds, bring your own sleeping bag), with breakfast and lunch provided each day.

We will host an opening dinner on Tuesday, May 14, at the caterer's nearby restaurant along with a closing dinner on Saturday, May 18, at the same location. A shirt and patch is provided to those attending --- patch design shown nearby.

We are also hosting a Radio Merit Badge workshop for local Scouts on Saturday, May 18, from 9 am to 2 pm to allow us to fully test the training prior to the Jamboree.

At the end of the week, everything will be disassembled and packed, with the express goal of ensuring everything arrives undamaged and is readily unpacked and ready to set up. This should go a long way toward ensuring trouble-free set up at the Summit.

Many thanks to the Miami Valley Council for hosting us and to the staff members electing to support this important effort.

Action Plan

The listing below provides a broad overview of the operational planning for the K2BSA Amateur Radio Operation. More detail is available from each operational team's action plan.

Task	Responsible	Deadline
Create/Revise Operations Plan Version 8.5	Leadership Team	Complete Feb-13
Finalize Sponsors and Supporters	Jim Wilson	Complete Feb-13
Inventory Existing K2BSA Equipment	Nathaniel Frissell, Scott Hooper, Ed Dudley	Complete Mar-12
Patch and Shirt Ordering	Jim Wilson	Complete Apr-13
SPLAT Briefing at the Summit	Jim Wilson	Complete Mar-13
Finalize Demo Station Operations Plan	Bill Bode & Team	Dayton May-13
Finalize Radio Merit Badge Ops Plan	Ron Wood	Dayton May-13
Finalize ARDF-Foxhunting Ops Plan	Keith Kaiser	Dayton May-13
Finalize Station Layout	Bill Bode	Complete Jul-12
Finalize Merit Badge Tent Layout	Ron Wood	Complete Jul-12
Finalize License Testing Plan/Materials	Alan Braun	Complete Mar-13
QSL Card Design completed and printed	Jim Wilson, Bill Bode	Complete Mar-13
Develop Demo Station Operator's Manual	Bill Bode	Dayton May-13
Develop Radio Merit Badge Curriculum	Ron Wood	Dayton May-13
Arrange for transport to Jamboree and schedule sponsor equipment shipping to the Miami Valley Council	Jim Wilson	Complete Apr-13
Dayton Drill @ cricket holler	Jim Wilson, and volunteer staff members	13 to 20 May-13
WV8BSA Repeater Installation	Scott Bigger, ICOM	Week of 20-May-13
Installation of Towers/Antennas	Russ Mickiewicz	11 to 14-Jul-13
Establish ARDF-Foxhunting Course	Keith Kaiser	11 to 14-Jul-13
Installation of Demonstration Station	Russ Mickiewicz, Bill Bode	11 to 14-Jul-13
Installation of Radio Merit Badge Classes	Russ Mickiewicz, Ron Wood	11 to 14-Jul-13
Training Staff Members	Leadership Team	11 to 14-Jul-13
Operations Start	All staff	15-Jul-13
Train Second Half Staff Members	Leadership Team	18-Jul-13
Operations End	All staff	24-Jul-13
Site tear down and packing	All staff	24 to 25-Jul-13

Changes from Previous Jamborees

Based on experience at previous Jamborees, we've elected to focus only on the amateur radio portion of the Radio Merit Badge. This is because shortwave listening and radio broadcasting options were not pursued by Scouts at the last Jamboree. The appendix has a chart showing how the Radio Merit Badge has experienced a rapidly growing level of interest from Scouts over the past two decades, demonstrated by a 600% increase in the number of badges earned annually from 1990 (954 badges) to 2010 (6,994 badges). Other changes are the consolidation of all Radio Merit Badge activities at the main location, since the Merit Badge Midway will not be in operation at the 2013 Jamboree. Amateur radio FCC license training is not being offered as it is felt that that activity comes at the expense of hands-on demonstration and earning the Radio Merit Badge. FCC license testing will be offered to those who have prepared for the examination prior to arrival at the Jamboree. A new activity is ARDF---Foxhunting that is a natural fit for the high adventure offered at the Summit and is a growing activity with youth and with Scouting.

Summary

This plan takes to heart the Jamboree phrase --- *Go Big. Get Wild*. It is also in tune with the overall focus of the Bechtel Summit Reserve project, to implement a world-class high adventure venue for the Boy Scouts of America. This plan does all that with an exclusive focus on Radio Scouting --- amateur radio and Scouting.

It takes an unfettered approach to building a first-class experience for Scouts and Scouters as they examine amateur radio, perhaps for the first time. It's a fun, engaging, and active introduction to technology and communication around the world. It further looks to collaborate with manufacturers in elevating the experience from previous Jamborees and putting things in place for the long term that can benefit all future Jamborees as well as other events that occur at the Summit.

Appendix A --- Equipment Listing

This is the current equipment listing sorted by area of the K2BSA operation. It duplicates the current Jamboree Bill of Materials.

Demonstration Station Tent

Item Description	Size	Quantity	Spec Sheet #	Other Info
TENT, RENTAL, 40' X 40', WHITE	40 x 40	1	199	Line #199 from Generic Shopping List
Flooring for full tent	40 x 40	1		Need floor in this tent to protect from electrical hazard
PARTITION, 4' X 8'		16	178	Line #178 from Generic Shopping List
Barrel, Trash 40 Gal		1	206	Line #206
Broom, Sweep, Straw		1	209	Line #209
Dust Pan		1	220	Line #220
Liner, Trash Can 50 Gal		1 pkg of 20	242	Line #242
Rope, 1/4" Nylon (Braid)		250 feet	257	Line #257
Cart, Garden		1	269	Line #269
Chair, Folding		36	302	Line #302
Fire Ext. CO2		1	321	Line #321
Lamp, Fluor, AC		10	333	Line #333 (what materials needed to mount?)
Wiring for flourescent lamps		1		Wiring and mounting the fluorescent lamps
Power Strip, Surge Protector		12	356	Line #356
Table, 6 ft. Folding		12	379	Line #379
Tape, Duct, Grey		8	385	Line #385
Tape, Insul, Black Electric		4	386	Line #386
Knife, Box Cutter		2	496	Line #496
Ladder, Step 8 ft		1	499	Line #499
Extension Cord, 100'		1	513	Line #513
Extension Cord, 50'		4	515	Line #515
Ties, Cable Assorted Bag 700pc		1	521	Line #521
Office Supply Kit		1		Contents specified via email
Station Computers, Laptops for logging and PSK		10		Standard from BSA
Server Unit for logging contacts and uploading to Web		1		Standard from BSA
Large Computer Monitor for Demonstration		6		Standard from BSA, size determined by donation
K2BSA Demonstration Station Sign		1		Sign at tent doorway

Item Description	Size	Quantity	Spec Sheet #	Other Info
K2BSA Amateur Operations Sign		1		General sign to direct traffic to area
White Board on Stand with Wheels		1		Need spec sheet
HF Transceiver, similar to ICOM 7200		4		Donor provided
Antenna Tuner, similar to ICOM AT-180		4		Donor provided
Power Supply Unit, similar to ICOM PS126		7		Donor provided
Desk Microphone, similar to ICOM SM-30		7		Donor provided
External Speaker, similar to ICOM SP-10		7		Donor provided
Interface Units for PSK		5		Specifications to be determined, Donor Provided
Headphones		20		Specifications to be determined, Donor Provided
Headphone splitter units		5		http://www.pyleaudio.com/sku/PHA40/4-Channel-Stereo-Headphone-Amplifier
VHF/UHF Transceiver, similar to ICOM IC-2820H		2		Donor provided
VHF-UHF D-Star upgraded, similar to ICOM UT-123		2		Donor provided
Battery Backups for Emergencies		2		Specifications to be determined, Donor Provided
HF Antennas and Coaxial Cable		6		Specifications to be determined, Donor Provided
Lightning Protection Units		7		Specifications to be determined, Donor Provided
VHF-UHF Antennas		2		Specifications to be determined, Donor Provided
HF Band Filters and/or antenna switches		5		Specifications to be determined, Donor Provided
DX HF Transceiver, similar to ICOM 7600		1		Donor provided
DX HF Power Amplifier, similar to ICOM PW-1		1		Donor provided
Satellite Stations, similar to ICOM 9100		2		Donor provided
Az-El directional antenna		1		Donor provided
Fixed omnidirectional antenna		1		Donor provided
32" Television Displays for Waiting Queue		3		Standard display

Item Description	Size	Quantity	Spec Sheet #	Other Info
55" Television Displays for Demonstrations		1		Standard Display
DVD Players for use with displays		2		Standard unit
Lamp, Desk, SM		10	331	Line #331
RF and Electrical Grounding System		1		Custom made, need specification sheet
#6 wire		200 ft		For grounding system (RF ground)
Ground rods		4		For grounding system (RF ground)
Ground rod clamps		4		For grounding system (RF ground)
Small sledge hammer for driving in ground rods		1		For grounding system (RF ground)
Copper braid wire		100 ft		For grounding system (RF ground)
Printer		1		
Telephone Poles		3		

Radio Merit Badge Tent #1

Item Description	Size	Quantity	Spec Sheet #	Other Info
Tent, Rental, 20' x 20', White	20 x 20	1	189	Line #189 from Generic Shopping List
Partition, 4' x 8'		3	178	Line #178
Barrel, Trash 40 Gal		1	205	Line #205
Broom, Sweep, Straw		1	209	Line #209
Dust Pan		1	220	Line #220
Liner, Trash Can 50 Gal		1 pkg of 20	242	Line #242
Chair, Folding		28	302	Line #302
Lamp, Fluor, AC		6	333	Line #333 (what materials needed to mount?)
Wiring for flourescent lamps		1		Mounting and wiring lamps
Power Strip, Surge Protector		0	356	Line #356, dropped, in office kit below
Table, 6 ft. Folding		8	379	Line #379
White Board on Stand with Wheels		2		Need spec sheet
Large Screen Television for presentations		2		55" LED TV
Computer and display software		2		Laptops to drive the Computer Display
K2BSA Radio Merit Badge Sign		1		For use at entrance
Easel and Flip Chart		2		Need spec sheet
Office Supply Kit		1		Specified in email
Markers, Dry, Box		4	158	Line #158
Easel Pad		8	165	Line #165
Portable shortwave receiver		1		Need specifications

Radio Merit Badge Tent #2

Item Description	Size	Quantity	Spec Sheet #	Other Info
Tent, Rental, 20' x 20', White	20 x 20	1	189	Line #189 from Generic Shopping List
Partition, 4' x 8'		3	178	Line #178
Barrel, Trash 40 Gal		1	205	Line #205
Broom, Sweep, Straw		1	209	Line #209
Dust Pan		1	220	Line #220
Liner, Trash Can 50 Gal		1 pkg of 20	242	Line #242
Chair, Folding		28	302	Line #302
Lamp, Fluor, AC		6	333	Line #333 (what materials needed to mount?)
Wiring for flourescent lamps		1		Mounting and wiring lamps
Power Strip, Surge Protector		0	356	Line #356, dropped, in office kit below
Table, 6 ft. Folding		8	379	Line #379
White Board on Stand with Wheels		2		Need spec sheet
Large Screen Television for presentations		2		55" LED TV
Computer and display software		2		Laptops to drive the Computer Display
K2BSA Radio Merit Badge Sign		1		For use at entrance
Easel and Flip Chart		2		Need spec sheet
Office Supply Kit		1		Specified in email
Markers, Dry, Box		4	158	Line #158
Easel Pad		8	165	Line #165
Portable shortwave receiver		1		Need specifications

Foxhunting and Support Tent

Item Description	Size	Quantity	Spec Sheet #	Other Info
Tent, Rental, 20' x 20', White	20 x 20	1	189	Line #189 from Generic Shopping List
Partition, 4' x 8'		3	178	Line #178
Barrel, Trash 40 Gal		1	205	Line #205
Broom, Sweep, Straw		1	209	Line #209
Dust Pan		1	220	Line #220
Liner, Trash Can 50 Gal		1 pkg of 20	242	Line #242
Chair, Folding		20	302	Line #302
Lamp, Fluor, AC		6	333	Line #333 (what materials needed to mount?)
Wiring for flourescent lamps		1		Mounting and wiring lamps
Power Strip, Surge Protector		6	356	Line #356
Table, 6 ft. Folding		6	379	Line #379
Cart, Garden		1	269	Line #269
Tape, Duct, Grey		8	385	Line #385
Tape, Insul, Black Electric		4	386	Line #386
Knife, Box Cutter		2	496	Line #496
Ladder, Step 8 ft		1	499	Line #499
Extension Cord, 100'		1	513	Line #513
Extension Cord, 50'		4	515	Line #515
Computer for firmware uploads, software support, foxhunt training		3		Standard BSA issue
ARDF-Foxhunting Sign		2		Specification needed
Portable Satellite Transceivers		2		Specifications to be determined, Donor Provided
Portable Satellite Antennas		2		Specifications to be determined, Donor Provided
Signal Generator		1		Specifications to be determined, Donor Provided
Spectrum Analyzer		1		Specifications to be determined, Donor Provided
Antenna Analyzer		1		Specifications to be determined, Donor Provided
Oscilloscope		1		Specifications to be determined, Donor Provided
Digital Voltmeter		1		Specifications to be determined, Donor Provided
Crimpers, hand tools, soldering irons		1		Specification needed

Item Description	Size	Quantity	Spec Sheet #	Other Info
Power distribution box for charging hand-held units		2		Specification needed
Black Cat Utility Cart		1	293	Line #293
First Aid Kit, Large		1	322	Line #322
Tank of Hydrogen for Balloon (T Tank)		3		Specifications to be determined
High altitude balloon (600g capacity)		4		Specifications to be determined
Balloon filling and launching equipment		1		To be brought in by staff member
ARDF beacon transmitters		6		Specifications to be determined
ARDF receivers		20		Specifications to be determined
ARDF antennas (tape measure type)		20		Specifications to be determined
Suunto Nylon Control Markers (5 in a package)		2		Suunto Control Marker Ref#SS0049860000
Suunto Control Punches 'A' Series (10 in a package)		1		Suunto A-Series Ref#SS004980000
Orienteering Control Cards (50 in a package)		45		
Compass		10		Suunto A-20 Compass
35" Television Displays		2		For foxhunting training, satellite tracking
ARDF Attenuators		20		Arrow Antenna, 4 MHz, Fox Hunt Attenuator

VHF/UHF Repeaters at Rock Borrow

Item Description	Quantity	Spec Sheet #	Other Info
VHF Amateur Radio Repeater	1		Analog system provided by ICOM America
UHF Amateur Radio Repeater	1		Analog system provided by ICOM America
UHF D-Star Amateur Radio Repeater	1		Digital system provided by ICOM America
Systems include antennas, diplexers, control units. Require internet connections.			

Appendix B --- Electrical & Internet Requirements

This estimate of electrical requirements was prepared using available specifications for the equipment specified above. It should serve as an guideline for preparing electrical requirements (number of outlets, power ratings, etc.) for each of the operations.

Demonstration Station

Electrical Requirements ---
Adding up all the equipment above looks like 50 amperes at 120 VAC and 15 amperes at 240 VAC

Internet Requirements ---
Internet connections required for 10 stations for spotting networks, logging, and instruction/demonstration.

Radio Merit Badge Tents 1 & 2, Identical Requirements

Electrical Requirements ---
Adding up all the equipment above looks like 25 amperes at 120 VAC

Internet Requirements ---
Internet connections required for 2 stations for spotting networks, logging, and instruction/demonstration.

Foxhunting and Support Tent

Electrical Requirements ---
Adding up all the equipment above looks like 25 amperes at 120 VAC

Internet Requirements ---
Internet connections required for 2 stations for spotting networks, logging, and instruction/demonstration.

VHF/UHF Repeaters --- Rock Borrow

Electrical Requirements ---
Adding up all the equipment above looks like 50 amperes at 120 VAC

Internet Requirements ---
Internet connections required for three systems and the control links as well as communication links.

Appendix C --- Sponsor Equipment

Icom America

Item	Quantity	Notes
Demonstration Station HF Transceiver	4	ICOM 7200
Automatic Antenna Tuner	4	ICOM AT-180
Power Supply Unit	7	ICOM PS-126
Desk Microphone	7	ICOM SM-30
External Speaker	7	ICOM SP-10
Dipole Antenna	4	ICOM AH-710
Demonstration Station VHF/UHF Transceiver	3	ICOM IC-2820H
D-STAR Upgrade	2	ICOM UT-123
DXing station HF transceiver	1	ICOM 7600
Fixed satellite stations	2	ICOM IC-9100 Transceivers

SteppIR

Two Element Yagi --

00202 2 element 20m-6m Yagi	1
01412 40/30 Dipole Upgrade Option for 2 element Yagi	1
SDA 100 Controller	1
03222 12 Conductor Control Cable (200 feet)	200
03650 25 pin dsub Splice Connector	1
01321 Transceiver Interface Module SDA 100	1
01322 Tuning Relay	1
Transceiver Interface Cable ICOM	1

Verticals --

00417 BigIR Vertical Antenna 40m-6m (Qty 2)	2
06021 80m Base Loading Coil (Qty 2)	2
06033 80m-6m Ground Mounted Radial Kit (Qty 2)	2
00218 Small IR Vertical 20m-6m (Qty 2)	2
06023 40m/30m Base Load Coil (Qty 2)	2
06031 40m - 6m Ground Mounted Radio Kit (Qty2)	2

SDA 100 Controller (Qty 4)	4
03432 2x4 wire control cable (500 feet)	500
01321 Transceiver Interface module (Qty 4)	4
01322 Tuning Relay (Qty 4)	4
Transceiver Interface Cable -- ICOM (Qty 4)	4
03650 25 pin dsub cable splice assembly (Qty 4 or perhaps 8?)	4

Array Solutions

Item	Quantity
Bandpass Filter 80 meters, AS-80	1
Bandpass Filter 40 meters, AS-40	1
Bandpass Filter 30 meters, AS-30	1
Bandpass Filter 20 meters, AS-20	1
Bandpass Filter 17 meters, AS-17	1
Bandpass Filter 15 meters, AS-15	1
Bandpass Filter 12 meters, AS-12	1
Bandpass Filter 10 meters, AS-10	1

ARRL

1	ARRL Flag	5137
48	Ham Radio License Manual	0977
24	ARRL's Tech Q & A	0847
24	Getting Started with Ham Radio	9728
24	General Class License Manual	8119
10	General Q & A	8089
15	Extra Class License Manual	5170
5	Extra Q & A	4708
2	Instructor's Manual	1263
5	Understanding Basic Electronics	0823
6	ARRL Handbook	4050
6	ARRL Operating Manual	5965
6	ARRL Antenna Book	6948
5	ARRL Map of North America	8977
5	World Map, Azimuth Projection	7717
3	World Map, Robinson Projection	8804

2	Polar Map for Oscar	1300
10	DXCC List	3862
10	ARRL Radiogram Pad	1320
10	Spiral Bound Log Book	1250
10	US Amateur Radio Bands Chart	1126
2	RF Exposure and You	6621
2	ARRL RFI Book	0915
2	Get on the Air with HF Digital	6016
2	RTTY/PSK31 for Radio Amateurs	0329
2	GPS and Amateur Radio	9922
2	VoIP: Internet Linking	1431
2	Nifty E-Z Guide to D-STAR Operations	0125
5	Repeater Directory	2605
5	FCC Rules for ARS	1173
5	ARRL's Hamspeak: A Dictionary	8423
2	The ARRL Film Collection DVD	3725
2	Ham Radio for Dummies	9392
2	Transmitter Hunting	2701
2	Radio Orienteering: ARDF Handbook	0131
5	Pocket Ref	1148
1	DVD Series: Foxhunting	9286
1	Peter I Island Dxpedition DVD	1162
5	ARRL/VEC VE Manual	1328
5	HAM Oval Stickers	0169
20	Educational Bookmark and Ruler	1063
20	ARRL Pens	0170
1	ARRL Five Pillars Banner Stand	0310
5	Table Throw Display	0151
10	Ham Radio Youth Flyer	YTHF
10	We Do That! Technology Brochure	TECH
50	Amateur Radio ID Badge Lanyard	LNYD
20	Volunteer Examiner ID Badge Lanyard	1342
2	Volunteer Examiner Zippered Portfolio	5001
TBD	ARRL Globe Stickers	

# Appendix D --- Facilities Diagram

Location 37 degrees 55' 0" North, 81 degrees 7' 28" West ---- Summit Center Gateway

Location GW-28

Location GW-27

Location GW-26

Location GW-25
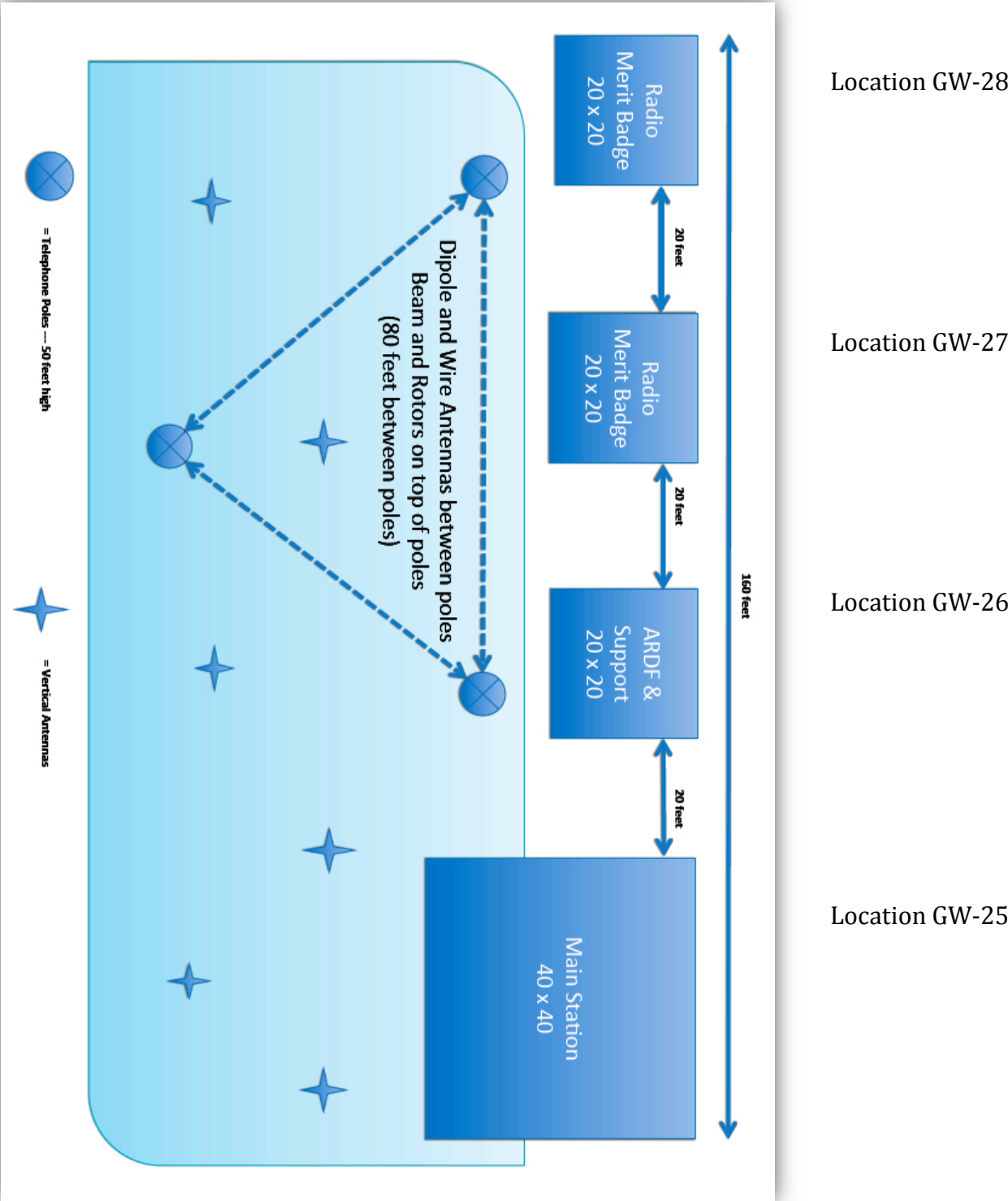
Appendix E --- Summit Location

This is a snapshot of the location of the K2BSA operation within the Summit Center.
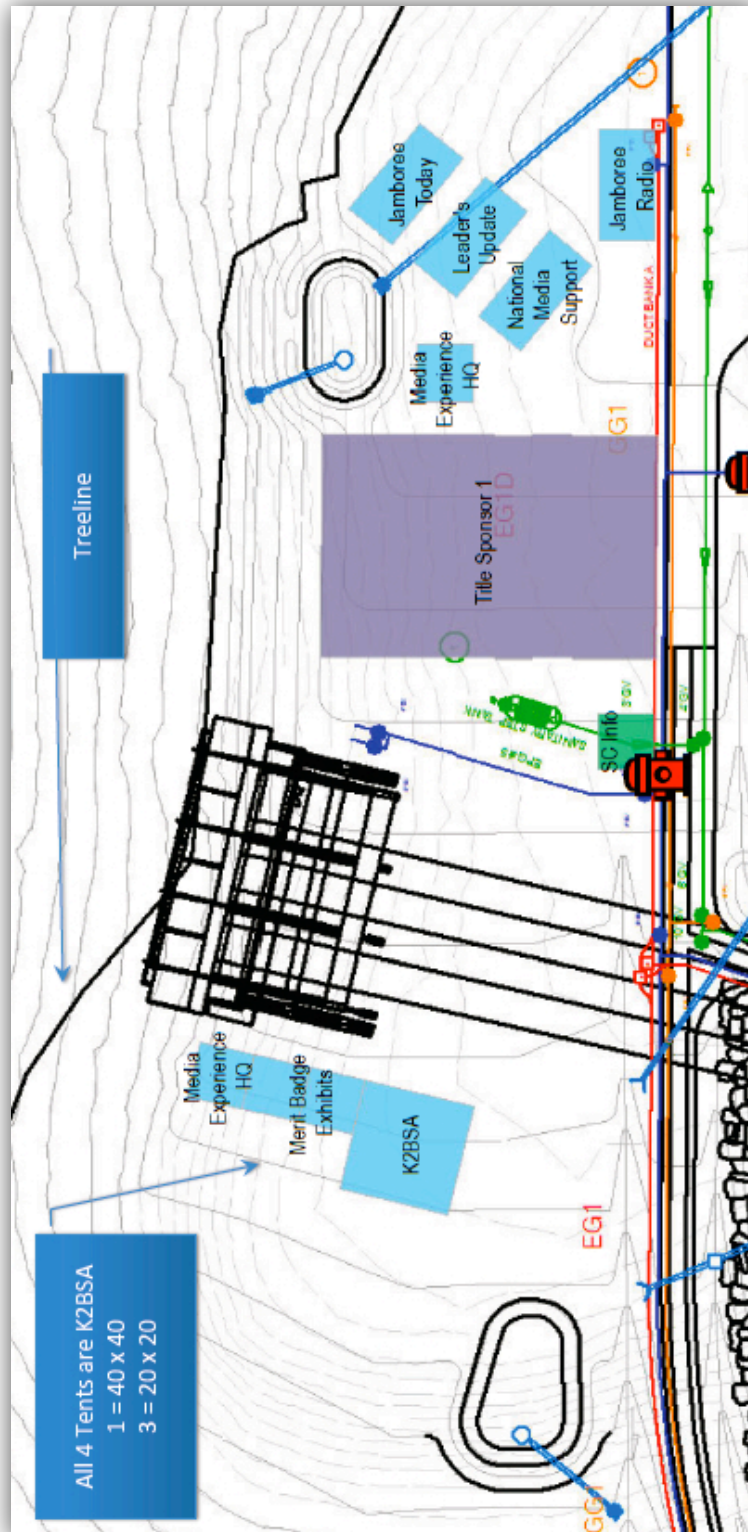
Appendix F --- Antenna Requirements

The photo below is of the K2BSA installation at Fort A.P. Hill for the 2010 Jamboree. This shows several telephone poles used for the rotatable beam antennas for 10 meters, 15 meters, 20 meters, and 40 meters. For the Summit 2013 Operation we are proposing just one telephone pole for use by the DXing station, with a multi-band beam covering all bands from 20 meters to 6 meters. The HF demonstration stations would use multi-band vertical antennas that would be mounted on the ground. The VHF/UHF demonstration stations would use mast mounted vertical antennas.

The vertical antennas would also need to be arranged as traffic free. They will have live RF energy on the antennas that could result in shock. In addition, ground radials will be installed around the antenna --- laying on top of the ground. These too would pose risks to passing traffic.

Finally, the antennas need some separation from one another to avoid receiver overload and interference. In addition, a strong grounding system is needed for all the antennas and transceivers in the main station tent.

Appendix G --- WV8BSA Repeater Location and Coverage

Location 37 degrees 54' 9.2" North, 81 degree 7' 48" West, ground elevation 2,421 feet, tower height for amateur repeater antennas 48 feet. Rock Borrow location.

UHF talk-In prediction, maximum distance shown 30 km, VHF talk-in shown earlier.
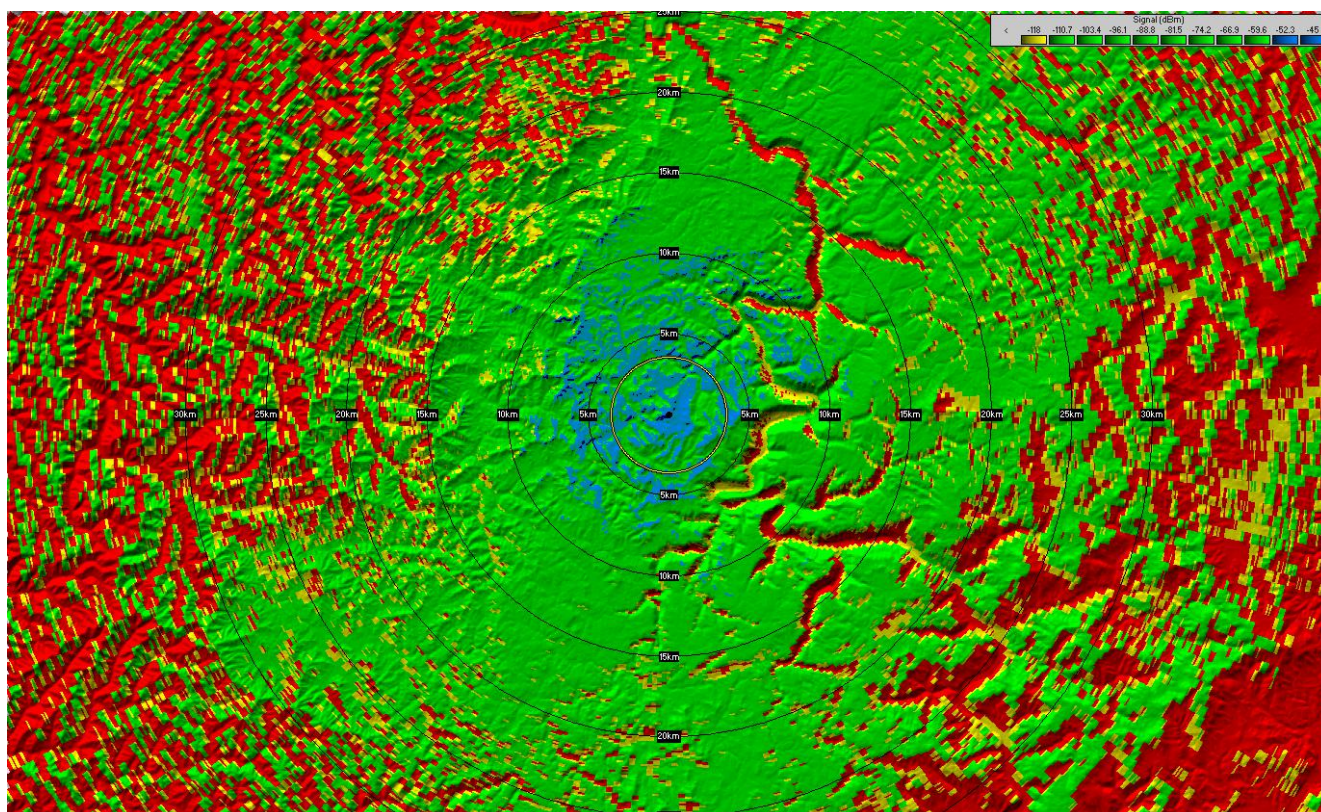
Repeater	Input Frequency	Output Frequency	Tone
2 m Analog	146.100 MHz	146.700 MHz	123.0 Hz
70 cm Analog	449.025 MHz	444.025 MHz	123.0 Hz
70 cm D-Star	446.8125 MHz	441.8125 MHz	Not applicable

Appendix H --- Top Level Position Descriptions

K2BSA Chairman

Overall manager for the K2BSA amateur radio operation, reporting to the Jamboree Media Center Chairman.

Duties Prior to Jamboree:

- Recruit key staff for each of the areas.
- Pursue sponsorships and donations.
- Working with staff leadership, build a comprehensive plan for Jamboree operations.
- Contact radio and other vendors for use of equipment.
- Prepare staff guides and other support materials.
- Drive communication to staff members.
- Build needs list for both equipment that will be donated and/or loaned and materials that will need to be purchased.
- Meet with communication/emergency associates and coordinate efforts.

Duties at the Jamboree:

- Interface with the Boy Scout organization.
- Supervise overall operation.
- Hold short staff meetings daily.
- Be a floating alternate to fill in where needed.
- Work with the emergency/communications personnel to provide backup communications.

Duties after the Jamboree:

- See that all the borrowed equipment is returned and all sponsorship agreements are fulfilled.
- Prepare an after action report.
- Write thank-you notes to all staff and vendors.
- Prepare QSL cards for mailing
- Be available to the International Division for radio related questions.
- Staff evaluations

Position Profile

- Licensed and active ham, registered Scouter
- Experienced at executive management level in organizing and achieving high level performance from staff members in a technical environment

K2BSA Station Team Leader

Key leader for the K2BSA amateur radio demonstration station. Driven to introduce amateur radio to Scouts in a fun and highly interactive manner.

Duties prior to Jamboree

- Working with the Support Team Leader, develop station layouts and detailed bill of materials
- Working with the demonstration station team, build the operations plan including bands, times, antennas, etc.
- Develop an operations manual for use by the demonstration staff
- Provide training for all staff members both prior to Jamboree and at the Jamboree site
- Build staffing plans with assignments for operators to shifts as well as days off. Take into account those that are only on staff for the first half and those only on staff for the second half.
- Determine message handling requirements and establish process/staffing
- Determine throughput of demonstrations and develop goals. Assure goals are established, measured, and met.

Duties at the Jamboree

- Conduct installation of K2BSA operation
- Train staff members
- Develop staff into shifts
- Active problem solving
- Ensure QSL cards completed for each QSO
- Tear down of Jamboree facilities, packing of equipment and shipment to next location or storage

Position Profile

- Licensed and active ham, often in leadership roles
- Registered and active Scouter
- Jamboree experience helpful but not necessary
- Driven to introduce amateur radio to Scouts through demonstrating the excitement of on-air communication and encouraging their active participation
- Supports new approaches
- Well developed leadership skills
- Dedicated team builder and team player

K2BSA Radio Merit Badge Team Leader

Key leader for the Radio Merit Badge team. Passionate about teaching and providing great experiences for Scouts in learning about amateur radio and helping them advance their knowledge.

Duties prior to Jamboree

- Working with the Station Team Leader and Support Team Leader, develop detailed bill of materials that include the Radio Merit Badge team requirements.
- Develop floor plan layouts for the merit badge instruction tent
- Working with the Merit Badge Team, build the training plans for merit badge instruction
- Prepare staffing plans that include shift assignments and off times for staff. Take into account those that are present only for the first half or the second half of the Jamboree
- Evaluate, select, and implement training aids and computer based training tools
- Train the Merit Badge Team members to fulfill their roles.
- Determine throughput of training/testing and develop goals. Assure goals are established, measured, and met.
- Working with the K2BSA chairman, station team leader, and support team leader, facilitate FCC license testing on a periodic basis during the Jamboree to address the needs expressed by attendees.

Duties at the Jamboree

- Conduct installation of merit badge tents
- Train staff members
- Develop staff into shifts
- Active problem solving
- Tear down of Jamboree facilities, packing of equipment and shipment to next location or storage

Position Profile

- Licensed and active ham, often in leadership roles
- Registered and active Scouter
- Jamboree experience helpful but not necessary
- Driven to introduce amateur radio concepts to Scouts and help them earn the Radio Merit Badge as part of an overall exciting experience at the K2BSA Jamboree operation.
- Supports new approaches
- Well developed leadership skills
- Dedicated team builder and team player

K2BSA License Exam Team Leader

Key leader for the K2BSA amateur radio license examinations. Highly experienced and strong expertise in organizing and operating license examinations.

Duties prior to Jamboree

- Working with the Chairman, develop estimates of the number of individuals that will take advantage of the testing sessions at the Jamboree.
- Working with the Chairman and the K2BSA leadership team, determine the number of sessions to be offered and develop a schedule of days/times.
- Build staffing plans with assignments for all VE's. Take into account those that are only on staff for the first half and those only on staff for the second half.
- Working with the Chairman, secure necessary supplies for conducting the exams and develop procedures for submitting exam results.
- Develop certificates for those who pass the examination to commemorate their Jamboree accomplishment.
- Provide training for all K2BSA staff members who are VE's both prior to Jamboree and at the Jamboree site.

Duties at the Jamboree

- Train VE staff members.
- Develop staff schedule.
- Lead examination sessions.
- Active problem solving.
- Tear down of Jamboree facilities, packing of equipment and shipment to next location or storage

Position Profile

- Licensed and active ham, often in leadership roles.
- Registered and active Scouter.
- Jamboree experience helpful but not necessary.
- High level of experience in implementing the Volunteer Examination Program.
- Supports new approaches.
- Well-developed leadership skills.
- Dedicated team builder and team player.

K2BSA Support Team Leader
Key technical leader for the entire K2BSA operation. Works across all areas to determine requirements, installs and implements selected technology, and actively troubleshoots issues that occur.

Duties prior to Jamboree
- Prepare station design, site plan, requirements list, antenna requirements
- Working with Station Team Leader and Radio Merit Badge Team Leader, build detailed bill of materials for all K2BSA equipment and facilities needs
- Working with Station Team Leader develop operating procedures and help prepare operations guide for use by all operators
- Working with the Station Team Leader and the Radio Merit Badge Team Leader, prepare installation plans for the entire operation.
- Develop an emergency system that involves all K2BSA staff members and other amateur radio operators on the Jamboree property

Duties at the Jamboree
- Working with fellow team leaders, install all equipment and ensure its operation throughout the Jamboree
- Monitor repeater operation and ensure trouble free operation
- Establish computer networks for logging software
- Supervise and control on site computers and software
- Upload logs in real time or at a minimum daily to Club Log and Logbook of the World
- Capture photos/videos of Jamboree operations
- Keep world-wide audiences informed of K2BSA operations via social media and website
- Operate the emergency communications network in times of emergency, conduct tests to ensure it is ready for operation
- Tear down of Jamboree facilities, packing of equipment and shipment to next location or storage

Position Profile
- Licensed and active ham, often in leadership roles
- Registered and active Scouter
- Jamboree experience helpful but not necessary
- High level of technical expertise and skills as well as the ability to work collaboratively with others to meet their technical requirements.
- Supports new approaches
- Well developed leadership skills
- Dedicated team builder and team player

K2BSA Media Leader

Key interface with various media outlets including Scouting media, amateur radio media, as well as national news media. Responsible for telling the K2BSA Jamboree story in words, photos, videos, etc. to all interested audiences meeting their need for insight into the K2BSA operation.

Duties prior to Jamboree

- Ensure that all K2BSA social media outlets are ready to handle posting of news and images.
- Ensure that the K2BSA website is prepared to handle posting of news, images, videos, etc.
- Connect with BSA Jamboree and National Office website staff to ensure they have needed content for their operations before, during, and after the Jamboree.
- Establish story contacts with Scouting, amateur radio, and national media outlets.
- Connect with Jamboree Today and Leaders Update staff to facilitate timely posting of K2BSA stories during the Jamboree.

Duties at the Jamboree

- Working with fellow team leaders, install all equipment and ensure its operation throughout the Jamboree.
- Actively engage Jamboree, Scouting, amateur radio, and national news media in sharing the story of K2BSA operations.
- Capture photos/videos of Jamboree operations.
- Record the full K2BSA effort and prepare an online summary.
- Keep world-wide audiences informed of K2BSA operations via social media and website
- Tear down of Jamboree facilities, packing of equipment and shipment to next location or storage

Position Profile

- Licensed and active ham, often in leadership roles.
- Registered and active Scouter.
- Jamboree experience helpful but not necessary.
- High level of communication expertise and the ability to work with all media outlets to ensure that the K2BSA story is told to a wide variety of audiences.
- Ability to operate social media channels and websites (WordPress).
- Ability to operate audio recorders as well as still and motion cameras.
- Proven ability to interface with media and with Scouts and Scouters to get the story.
- Supports new approaches.
- Well developed leadership skills.
- Dedicated team builder and team player.

Appendix I --- 2010 Jamboree Results

Staff Members   46 positions filled from 50 allocated
Demonstration Station visitors   5,000+
Radio Merit Badge   332 started, 210 completed
FCC Licensing   316 took the test
                                   143 Technician licenses
                                   33 General licenses
                                   8 Extra Class licenses

Appendix J --- U.S. Licensed Amateur Radio Operators

The number of licensed amateur radio operators has continued to grow over the last several decades. It is now at over 700,000. The end of 2012 marked the highest number of licensed radio amateurs ever.

Date (month of December for each year)	Licensed Amateur Radio Operators
1971	285,000
1981	433,000
1991	494,000
2001	683,000
2011	704,236
2012	709,500

Radio Merit Badges Earned
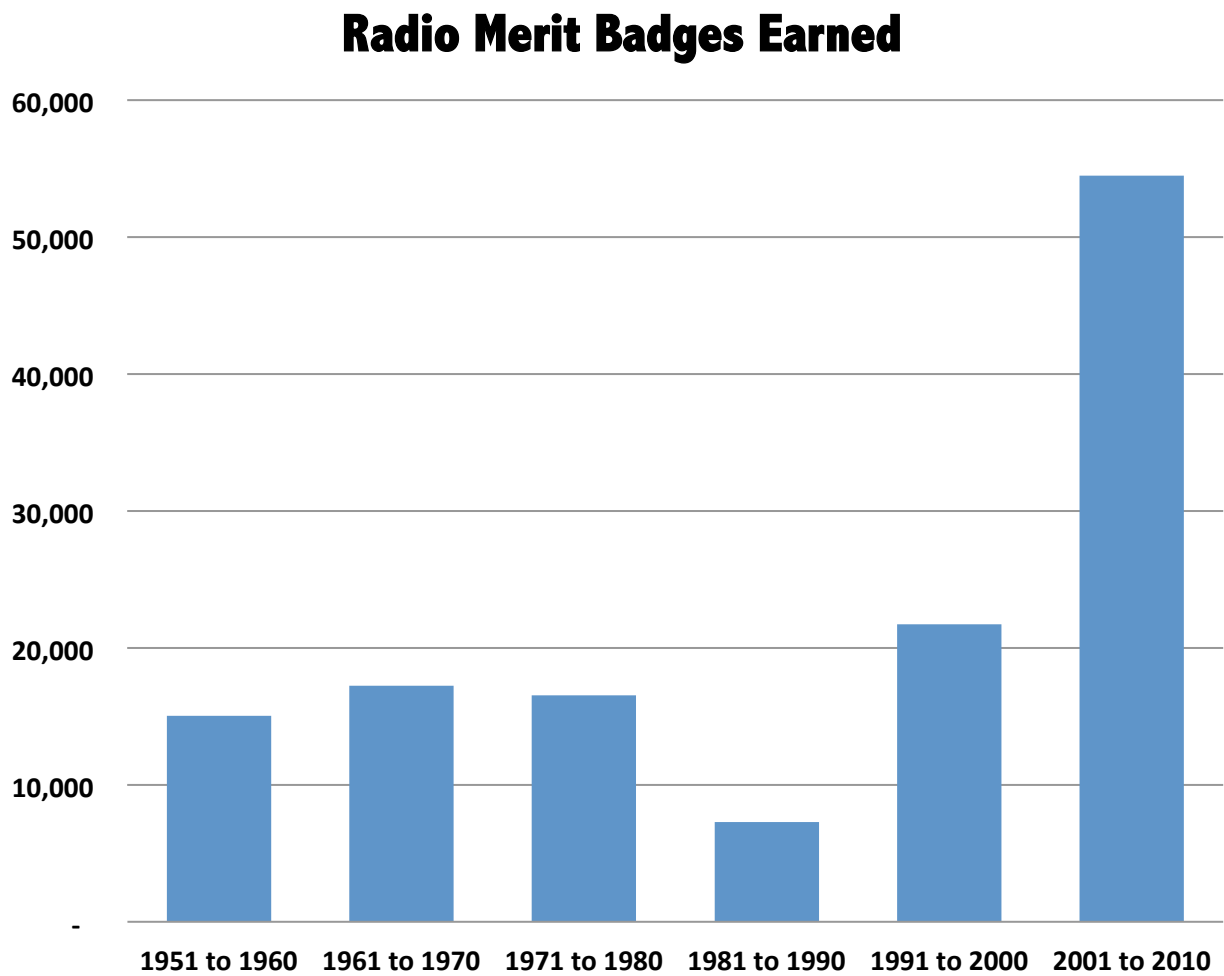
Appendix L --- Radio Merit Badge Requirements

Number	Requirement Description	Time Allotted	Segment 1	Segment 2	Segment 3
		Min.	Min.	Min.	Min.
1	Explain what radio is. Then discuss the following:	5	5		
1.a.	The difference between broadcast radio and hobby radio.	5	5		
1.b.	The difference between broadcasting and two-way communication.	5	5		
1.c.	Radio station call signs and how they are used in broadcast radio and amateur radio.	5	5		
1.d.	The phonetic alphabet and how it is used to communicate clearly.	5	5		
2	Do the following:				
2.a.	Sketch a diagram showing how radio waves travel locally and around the world. Explain how the broadcast radio stations WWV and WWVH can be used to help determine what you will hear when you listen to a shortwave radio.	10	10		
2.b.	Explain the difference between a DX and a local station. Discuss what the Federal Communications Commission (FCC) does and how it is different from the International Telecommunication Union.	10	10		
3	Do the following:				
3.a.	Draw a chart of the electromagnetic spectrum covering 100 kilohertz (kHz) to 1,000 megahertz (MHz).	10			10
3.b.	Label the MF, HF, VHF, and microwave portions of the spectrum on your diagram.	5			5
3.c.	Locate on your chart at least eight radio services, such as AM and FM commercial broadcast, citizens band (CB), television, amateur radio (at least four amateur radio bands), and public service (police and fire).	5			5
4	Explain how radio waves carry information. Include in your explanation: transceiver, transmitter, receiver, amplifier, and antenna.	10			10

Number	Requirement Description	Time Allotted Min.	Segment 1 Min.	Segment 2 Min.	Segment 3 Min.
5	Do the following:				
5.a.	Explain the difference between a block diagram and a schematic diagram.	5	5		
5.b.	Draw a block diagram for a radio station that includes a transceiver, amplifier, microphone, antenna, and feed line.	10	10		
5.c.	Explain the difference between an open circuit, a closed circuit, and a short circuit.	5			5
5.d.	Draw eight schematic symbols. Explain what three of the represented parts do. Find three electrical components to match to three of the symbols.	10			10
6	Explain the safety precautions for working with radio gear, including the concept of grounding for direct current circuits, power outlets, and antenna systems.	10	10		
7	Visit a radio installation (an amateur radio station, broadcast station, or public service communications center, for example) approved in advance by your counselor. Discuss what types of equipment you saw in use, how it was used, what types of licenses are required to operate and maintain the equipment, and the purpose of the station.	10			10
8	Find out about three career opportunities in radio. Pick one and find out the education, training, and experience required for this profession. Discuss this with your counselor, and explain why this profession might interest you.	15			15

Number	Requirement Description	Time Allotted Min.	Segment 1 Min.	Segment 2 Min.	Segment 3 Min.
9	Do One of the following (a OR b OR c):				
9.a.	AMATEUR RADIO				
9.a.(1)	Tell why the FCC has an amateur radio service. Describe some of the activities that amateur radio operators can do on the air, once they have earned an amateur radio license.	10	10		
9.a.(2)	Using proper call signs, Q signals, and abbreviations, carry on a 10-minute real or simulated amateur radio contact using voice, Morse code, or digital mode. (Licensed amateur radio operators may substitute five QSL cards as evidence of contacts with amateur radio operators from at least three different call districts.) Properly log the real or simulated ham radio contact and record the signal report.	30		30	
9.a.(3)	Explain at least five Q signals or amateur radio terms you heard while listening.	10	10		
9.a.(4)	Explain some of the differences between the Technician, General, and Extra Class license requirements and privileges. Explain who administers amateur radio exams.	10			10
9.a.(5)	Explain how you would make an emergency call on voice or Morse code.	5			5
9.a.(6)	Explain the difference between handheld transceivers and home "base" transceivers. Explain the uses of mobile amateur radio transceivers and amateur repeaters.	5			5

Number	Requirement Description	Time Allotted	Segment 1	Segment 2	Segment 3
		Min.	Min.	Min.	Min.
9.b.	BROADCAST RADIO				
9.b.(1)	Prepare a program schedule for radio station "KBSA" of exactly one-half hour, including music, news, commercials, and proper station identification. Record your program on audio tape or in a digital audio format, using proper techniques.				
9.b.(2)	Listen to and properly log 15 broadcast stations. Determine the program format and target audience for five of these stations.				
9.b.(3)	Explain at least eight terms used in commercial broadcasting, such as segue, cut, fade, continuity, remote, Emergency Alert System, network, cue, dead air, PSA, and playlist.				
9.c.	SHORTWAVE LISTENING				
9.c.(1)	Listen across several shortwave bands for four one-hour periods—at least one period during daylight hours and at least one period at night. Log the stations properly and locate them geographically on a globe.				
9.c.(2)	For several major foreign stations (BBC in Great Britain or HCJB in Ecuador, for example), list several frequency bands used by each.				
9.c.(3)	Compare your daytime and nighttime logs; note the frequencies on which your selected stations were loudest during each session. Explain differences in the signal strength from one period to the next.				

	TOTAL TIME	210	90	30	90

Appendix M --- Demonstration Station Shift Schedules

Team One

	Su	M	T	W	Th	F	S	Su	M	T	W
	14	15	16	17	18	19	20	21	22	23	24
700											
800				x		x		x		x	
900				x		x		x		x	
1000				x		x		x		x	
1100				x		x		x		x	
1200				x		x		x		x	
1300				x		x		x		x	
1400				x		x		x		x	
1500				x		x		x		x	
1600				x		x		x		x	
1700			x		x		x		x		
1800			x		x		x		x		
1900			x		x		x		x		
2000			x		x		x		x		
2100			x		x		x		x		
2200			x		x		x		x		
2300			x		x		x		x		
2400			x		x		x		x		
100											
200											
300											
400											
500											
600											

Team Two

	Su	M	T	W	Th	F	S	Su	M	T	W
	14	15	16	17	18	19	20	21	22	23	24
700											
800					x		x		x		
900					x		x		x		
1000					x		x		x		
1100			x		x		x		x		
1200			x		x		x		x		
1300			x		x		x		x		
1400			x		x		x		x		
1500			x		x		x		x		
1600			x		x		x		x		
1700				x		x		x		x	
1800				x		x		x		x	
1900				x		x		x		x	
2000				x		x		x		x	
2100				x		x		x		x	
2200				x		x		x		x	
2300				x		x		x		x	
2400				x		x		x		x	
100											
200											
300											
400											
500											
600											

Night Operations Team

	Su	M	T	W	Th	F	S	Su	M	T	W
	14	15	16	17	18	19	20	21	22	23	24
700				x	x	x	x	x	x	x	x
800											
900											
1000											
1100											
1200											
1300											
1400											
1500											
1600											
1700											
1800											
1900											
2000											
2100											
2200											
2300											
2400			x	x	x	x	x	x	x	x	
100			x	x	x	x	x	x	x	x	
200			x	x	x	x	x	x	x	x	
300			x	x	x	x	x	x	x	x	
400			x	x	x	x	x	x	x	x	
500			x	x	x	x	x	x	x	x	
600			x	x	x	x	x	x	x	x	

Appendix N --- Current Staff Members

Name	Call	Jamboree Experience	Ham Radio Experience	Location
Frank Van Winkle	AA1FV	2010 Pioneering Staff	Licensed in 2001. Heavily involved in emergency communications in Oregon. Fifty plus years experience in Scouting.	Astoria, Oregon
Paul Trotter	AA4ZZ	2010 K2BSA	Licensed in 1975. Volunteer Examiner. VHF/UHF Contester and Author/Presenter. 432 MHz DXCC. Satellite, ISS ops at 2010 Jamboree.	Charlotte, North Carolina
Jim Craft	AD0AC	1993 Jamboree participant, 2010 Jamboree visitor	Licensed in 1997. Unit Commissioner, Order of the Arrow. Active in DX, foxhunting, field day, digital modes.	Independence, Missouri
Joe Riggs	AD4UM	Visited in 2005, participant in 1977, Pennsylvania	Licensed in 1993. Volunteer Examiner. Dxing, contesting, and Field Day. Teaches Radio Merit Badge.	Kingsport, Tennessee
Ron Wood	K0BR0	2010 K2BSA	Licensed in 1955. Volunteer Examiner. Primarily Dxing via CW --- roughly 300 countries. Philmont trek in 2011.	Belton, Missouri
Sid Hughes	K0SCH	2010 K2BSA	Licensed in 2006. Active in emergency communications. Setting up KB0BSA at Denver Council. Volunteer Examiner and Radio Merit Badge Counselor	Denver, Colorado
Bob Bereit	K3RMB	Visited four Jamborees	Licensed in 2005. Over 39 years as a Scout leader. Seven Philmont Treks. Operated PJ2T in 2010 CQ RTTY Contest.	Greensburg, Pennsylvania
Demi Pulas	K4BSA	2007 and 2011 World Scout Jamboree, operating ham radio station.	Licensed in 1965. Volunteer Examiner. Advisor for Venturing Crew with focus on amateur radio and first aid/cpr etc. Teaches Technician license classes each year, Radio Merit Badge counselor.	Falls Church, Virginia
Jim Forrester	K4JF	1981/1985 Textile Merit Badge, 2010 Masonic Scouters Exhibit	Licensed since 1975 with DXCC, WAC. ARRL Life Member, Volunteer Examiner.	Greenville, South Carolina
Jim Wilson	K5ND	2010 Media Center Director, 2005 visitor	Licensed 1973, active in CW contests, National JOTA Organizer, K2BSA President/Trustee, author Heathkit General Class Amateur Radio License Course.	Grapevine, Texas
John Solman	K9YB	1960 Participant	Licensed in 1961. Active with JOTA and Merit Badges	Lincoln, Massachusetts

Alan Kline	KB1DJ	First Jamboree	Licensed in 1976. Active in Field Day, JOTA, Handi-Hams, Volunteer Examiner, Silver Beaver.	Lynn, Massachusetts
Charlie Martin	KB3C0	First Jamboree	Licensed in 1978.	Blue Bell, Pennsylvania
Tanner Lovelace	KB4TYE	First Jamboree	Licensed in 1985. Volunteer Examiner. High altitude balloon expertise as well as ARES and APRS.	Durham, North Carolina
Mike Yammine	KB8CMS	First Jamboree	Licensed in 1987. Crew Advisor, Woodbadge. 2012 Philmont Trek. Active with Findlay Radio Club. Ice Hockey Player.	Findlay, Ohio
Anthony Gaito	KC0CSG	2010 K2BSA	Licensed in 1998. Active in emergency communication. Studying for Extra Exam.	Mableton, Georgia
Joe Griggs	KC0HCU	First Jamboree	License in 1958. Unit Commissioner. Active in Emcomm.	Gladstone, Missouri
Wm. Leslie	KC2FYY	2005 K2BSA	Licensed in 2000. Active in foxhunting, mountaintopping, Volunteer Examiner	Ossining, New York
Joel Monza	KC2SNL	2010 K2BSA, 2005 Participant	Licensed in 2007. Participant in ARRL Youth Committee. Volunteer Examiner, radio merit badge counselor, assistant Scoutmaster.	Chadds Ford, Pennsylvania
James Lithgow	KC9LXT	2010 participant, 2005 visitor	Licensed in 2007. Working on Extra. Active in HF and VHF/UHF including JOTA and event assistance. Philmont Trek in 2011.	Schaumburg, Illinois
James P. Craft	KD0MLW	First Jamboree	Licensed in 2010. Active in Dxing, Field Day.	Olathe, Kansas
Michael Tindall	KE5TBT	First Jamboree	Licensed in 2008. Active in Scouting and Emergency Communications.	Hedgesville, West Virginia
Paul Skyllingstad	KE7CET	First Jamboree	Licensed in 2004. Active with son in amateur radio and Scouting. Son on Jamboree Today staff in 2010 and 2013.	Tacoma, Washington
Chase Mansfield	KE7UMI	2010 Jamboree participant	Licensed in 2007.	Highland, Utah
Janell Lovelace	KI4BZG	First Jamboree	Licensed in 2003. High altitude balloon launches. Five years staffing National Youth Science Camp in West Virginia	Durham, North Carolina
Ryan Pugh	KI6SHE	2010 Participant	Licensed in 2008. Active in Scouting. Earned 131 Merit Badges. Active in emergency communication and foxhunting.	Laguna Niguel, California
Todd Weatherford	KI8CX	First Jamboree	Licensed in 1996. Troop committee member. Active in JOTA, radio merit badge, license classes, field day.	Prunedale, California
Dan Burrow	KJ6JZU	2010 Merit Badge Midway	Licensed in 2010 at the Jamboree. Active in Dxing, Field Day, RACES.	Oakhurst, California

Scott Hooper	KT0P	First Jamboree	Licensed in 1977. Active Dxing and Contesting. Led Woodbadge Patrol in JOTA operation. NOAC staff member for 6 conferences.	Charlottesville, Virginia
Bill Mowery	KU4PV	First Jamboree	Licensed in 1997. Volunteer Examiner. Frequently in West Viriginia. Remote operations and camping	Blythewood, South Carolina
Sean Maxey	KV0ICE	First Jamboree	Licensed in 2006. Eagle Scout. Philmont Staff. Wife was on Philmont Staff. Married at Villa Philamonte.	Decatur, Illinois
Rob Gresty	N3RLL	First Jamboree	Licensed in 1992.	Bowie, Maryland
Grant Graessle	N4PGG	1981 Participant	Licensed in 1994. Active Field Day competitor. Teaches Radio Merit Badge and License Prep.	California, Maryland
Bill Bode	N4WEB	2005 Trading Post, participant in 1977	Licensed since 2001. President Tampa Amateur Radio Club, active at Field Day and JOTA. Volunteer Examiner, teaches Radio Merit Badge.	Tampa, Florida
Hal Fuglaar	N5BXP	First Jamboree	Licensed in 1971. District Health and Safety Chairman (Day job 911 Paramedic). Shooting Sports Venturing Crew Advisor. Active with Satellites.	Rosenberg, Texas
Roy Adam	N6FUN	First Jamboree	Licensed in 1992. Active Scouter and drives JOTA in his council. Speaks Japanese and Indonesian.	Richmond, California
Rick Smith	N6GSE	First Jamboree	Licensed in 2010. Active with mentoring robotics projects.	Crofton, Maryland
Russ Mickiewicz	N7QR	2001/2010 K2BSA, 2005 Arts & Sciences	Licensed in 1966. Active in Dxing, contesting. Volunteer Examiner. Radio Merit Badge counselor.	Portland, Oregon
Jason Peeler	N9OPP	First Jamboree	License in 1992. Very active in Scouting. Unit Commissioner, Assistant Crew Advisor. Runs JOTA station at Council Camporee with 6,000 in attendance.	Plano, Illinois
Norm Huber	N9ZKS	2010 K2BSA	First licensed 1994. Very active in Scouting as commissioner. Also motorcycle club and emergency communication.	Bloomington, Illinois
Alan Braun	NS0B	2010 K2BSA	Licensed in 1985, Volunteer Examiner, teaches radio merit badge and active Dxer/contester. Philmont Trek in 2011.	Norwalk, Iowa
Mark Abromowicz	NT3V	2001, 2005, and 2010 K2BSA	Licensed in 1974. Active with Amateur Radio Newsline. Member ARRL PR Committee. Woodbadge Staff Member.	Reading, Pennsylvania
Chris Armstrong	W0CWA	First Jamboree	Licensed in 2002. Active with JOTA and International Scouting.	Lawrence, Kansas

Rick Clem	W0IS	1973 Jamboree participant, Idaho	Licensed in 1974. Active with QRP-CW portable operations tied to camping trips. Author of Technician License study guide.	St. Paul, Minnesota
Nathaniel Frissell	W2NAF	2005 and 2010 K2BSA, 1997 Participant	Licensed in 1998. Active in Dxing. Volunteer Examiner. Radio Merit Badge counselor. ARRL ad-hoc committee on youth in ham radio.	Blacksburg, Virginia
Rue Stuteville	W4RUE	2001/05 Cook Crew, 2010 K2BSA	Licensed in 1979. Volunteer Examiner. Troop Committee members, past Scoutmaster. Active in digital modes and kit building.	Norfolk, Virginia
Mike Sprenger	W4U00	First Jamboree	Licensed in 1992. Very active Scouter and amateur radio. Lots of satellite and JOTA operations. QRP PSK with iPhone app.	Brandon, Florida
Tim O'Rourke	W4YN	First Jamboree	Licensed in 1964. Builds QRP gear and uses SDR. Active in JOTA and license classes.	Charlotte, North Carolina
Keith Kaiser	WA0TJT	First Jamboree	Licensed in 1967. Active in EmComm, President Near Space Ventures an Amateur Radio Ballooning group, ran JOTA stations for past 25 years. ADC for Venturing. Teaches Radio, Emergency Preparedness, and Computer MB	Kansas City, Missouri
Steve Back	WB2OGY	2010 Retail Food	Licensed in 1964. Active in Dxing, contesting. Volunteer Examiner. Radio Merit Badge counselor. Active amateur radio Venturing Crew.	Lawrenceville, Georgia
David Verlinde	WB8AXP	1981 Participant, 1986 Youth Services	Licensed in 1966. Scoutmaster.	Rochester, Michigan

Appendix O --- Current Staff Assignments

Name	Call	Position	Dayton Drill	July 11 to 18	July 18 to 25
Jim Wilson	K5ND	Chairman	Cricket Holler	Full Session	
Alan Braun	NS0B	License Lead & Demo Station	Cricket Holler	Full Session	
Mark Abramowicz	NT3V	Media Lead		Full Session	
Bill Bode	N4WEB	Demonstration Station Team Leader	Cricket Holler	Full Session	
Anthony Gaito	KC0CSG	Demonstration Station		Full Session	
Bob Bereit	K3RMB	Demonstration Station	Cricket Holler	Full Session	
Frank Van Winkle	AA1FV	Demonstration Station		Full Session	
Nathaniel Frissell	W2NAF	Demonstration Station		Full Session	
Rob Gresty	N3RLL	Demonstration Station		Full Session	
Chase Mansfield	KE7UMI	Demonstration Station -- Youth		Full Session	
James Lithgow	KC9LXT	Demonstration Station -- Youth		Full Session	
Demi Pulas	K4BSA	Demonstration Station		Full Session	
Sean Maxey	KV0ICE	Demonstration Station		Full Session	
Michael Tindall	KE5TBT	Demonstration Station		Full Session	
John Solmon	K9YB	Demonstration Station		Full Session	
Roy Adam	N6FUN	Demonstration Station	Cricket Holler	1st Half	
Sid Hughes	K0SCH	Demonstration Station		1st Half	
Jason Peeler	N9OPP	Demonstration Station		1st Half	
Joe Griggs	KC0HCU	Demonstration Station			2nd Half
Grant Graessle	N4PGG	Demonstration Station			2nd Half
Ron Wood	K0BRO	Radio Merit Badge Team Lead	Cricket Holler	Full Session	
Charlie Martin	KB3CO	Radio Merit Badge		Full Session	

Name	Call	Role	Location	Session	
David Verlinde	WB8AXP	Radio Merit Badge	Cricket Holler	Full Session	
Jim Forrester	K4JF	Radio Merit Badge		Full Session	
Joe Riggs	AD4UM	Radio Merit Badge		Full Session	
Paul Skyllingstad	KE7CET	Radio Merit Badge	Cricket Holler	Full Session	
Rick Smith	N6GSE	Radio Merit Badge	Cricket Holler	Full Session	
Rue Stuteville	W4RUE	Radio Merit Badge		Full Session	
Steve Back	WB2OGY	Radio Merit Badge	Cricket Holler	Full Session	
Chris Armstrong	W0CWA	Radio Merit Badge		Full Session	
Todd Weatherford	KI8CX	Radio Merit Badge		1st Half	
James P. Craft	KD0MLW	Radio Merit Badge		1st Half	
Alan Kline	KB1DJ	Radio Merit Badge		1st Half	
Rick Clem	W0IS	Radio Merit Badge			2nd Half
Scott Hooper	KT0P	Radio Merit Badge	Cricket Holler		2nd Half
Russ Mickiewicz	N7QR	Support Team Leader	Cricket Holler	Full Session	
Mike Sprenger	W4UOO	Support Team		Full Session	
Dan Burrow	KJ6JZU	Support Team		Full Session	
Tim O'Rouke	W4YN	Support Team	Cricket Holler	Full Session	
Hal Fuglaar	N5BXP	Support Team		Full Session	
Bill Mowery	KU4PV	Support Team		1st Half	
Keith Kaiser	WA0TJT	Foxhunting Team Leader	Cricket Holler	Full Session	
Joel Monza	KC2SNL	Foxhunting		Full Session	
Norm Huber	N9ZKS	Foxhunting	Cricket Holler	Full Session	
Paul Trotter	AA4ZZ	Foxhunting		Full Session	
Ryan Pugh	KI6SHE	Foxhunting		Full Session	
W. Leslie	KC2FYY	Foxhunting		Full Session	
Spencer Tindall	KE5TBU	Foxhunting		Full	

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					Session	
Jim Craft	AD0AC	Foxhunting			1st Half	
Tanner Lovelace	KB4TYE	Foxhunting				2nd Half
Janell Lovelace	KI4BZG	Foxhunting				2nd Half
Mike Yammine	KB8CMS	Foxhunting		Cricket Holler		2nd Half

Appendix P --- Demonstration Station Team Assignments

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Appendix Q --- Radio Merit Badge Team Assignments

Team Leader: Ron Wood, K0BRO

Counselor/Training Teams

Team A:	Charlie Martin, KB3CO	
	Paul Skyllingstad, KE7CET	
Team B:	Steve Back, WB2OGY	
	James P. Craft, KDØMLW	(1st Session)
	Rick Clem, WØIS	(2nd Session)
Team C:	Rick Smith, N6GSE	
	Jim Forrester, K4JF	
Team D:	David Verlinde, WB8AXP	
	Scott Hooper, KTRØP	(2nd Session)
	Todd Weatherford, KI8CX	(1st Session)

RMB Equipment and Facilities Management

Rue Stuteville, W4RUE
Alan Kline, KB1DJ   (1st Session)
Joe Riggs, AD4UM

Program Administration --- Registrar

Chris Armstrong, W0CWA

Appendix R --- Staff Preparation Requirements

- Read the Jamboree Staff Manual
- Read the K2BSA Operations Manual
- Actively Participate in Staff Assignment Team Phone Conferences
- Study your assignment procedures and in the case of Radio Merit Badge, the curriculum that will be used during the Jamboree
- Pass Extra Class License exam before arrival
- Youth Protection Training --- Scouting and Venturing
- Register your arrival plans on the TMS site. You can do this at http://www.tms.com/2013jamboree/
  - This is required to reserve shuttle bus service from the airport.
  - It is also required if you are driving to the Summit so they can plan for your arrival with the appropriate level of check-in staff and buses.
- Order Staff Nameplate --- first line = name, second line = call sign, third line = K2BSA Ham Radio
- Complete Medical Forms and Submit
- Bring VEC Credentials
- Bring copy of amateur radio license
- Update your Jamboree Staff Photo. It needs to be a recognizable ID photo because it will be used for your Jamboree credentials.
- Complete a Personal Equipment Authorization Use Form and forward to Jim Wilson.
- Take care of any open Jamboree payments.

Appendix S --- Jamboree App Descriptions and Information

Demonstration Station --- hours/days and description of the activities

Demonstration Station Night Hours --- 8 PM to 8 AM with description of the availability.

Radio Merit Badge classes will run four hours from start to completion of the merit badge. They will cover all aspects of amateur radio including the fundamentals of operation, the theory behind radio communication, and introduce the requirements for licensing. It will consist of 90 minutes in an interactive class setting, 30 minutes communicating in an amateur radio station, followed by another 90 minutes in class. At this point you will have earned the Radio Merit Badge.

Entered each time for the full week. E.g. 9 AM to 1 PM each day, etc. In other words, entries for 9 AM classes by day, 10 AM classes by day, etc.

ARDF--Foxhunting is Amateur Radio Direction Finding, using hand-held amateur radio receivers and directional antennas to find hidden transmitters. It is very similar to traveling an orienteering course but using radio direction finding instead of a map and compass. You'll be given instruction in the use of the equipment and sent in search of up to five hidden transmitters. This is a team activity of no less that two members and not more than eight. You will have a time limit of 60 minutes on the search. There are no set start times, just show up, and we'll get you started as equipment is available.

Amateur Radio License Examinations will be offered beginning at 7 PM on the three days noted. There will be no preparation classes offered. So you'll need to prepare on your own, ideally over the weeks and months prior to the Jamboree. There is a $15 fee. See the list of items you'll need to bring or go to http://www.arrl.org/what-to-bring-to-an-exam-session

Come prepared to take your license examination. The fee is $15. You'll need a photo ID and your social security number or FCC issued FRN number. You can bring a calculator with memory and formulas cleared. If you already have an amateur radio license, bring the original or a photo copy.

High Altitude Balloon Launch --- We will launch a high altitude balloon with an amateur radio payload that allows tracking and possibly video observation of the flight. It is expected to rise to approximately 100,000 feet, where the balloon will burst with a parachute returning the payload to earth. Launch on July 18 is expected at the Summit Stadium as part of Airborne Day. Other launches will be at K2BSA. Launch timing is dependent on wind conditions and projected flight path.

Launches entered on July 18, 20, 23 with windows from 10 AM to 2 PM

International Space Station Contact --- Amateur radio contact with the International Space Station as it flies overhead. Several Scouts will be selected to ask the astronaut questions during the contact, which is expected to last approximately nine minutes as the space stations moves from horizon to horizon. The date and time will be scheduled with the space station as we get closer to the event.

Amateur Radio On Air Network --- 7 PM most nights on the 2 meter repeater. Amateur radio network for communication updates and comparing notes. Licensed amateur radio operators with transceivers can connect via the Summit amateur radio repeater at the following frequency: input 146.1 MHz, output 146.7 MHz, access tone 123.0 Hz.

Repeaters --- Amateur Radio Repeaters for communication at all times before, during, and after the Jamboree. There are 2 meter and 70cm analog as well as 70cm D-Star repeaters. Frequencies and tones ---

2 meter analog: 146.1 MHz input, 146.7 MHz output, 123.0 Hz tone

70cm analog: 449.025 MHz input, 444.025 MHz output, 123.0 Hz tone

70 cm D-Star: 446.8125 MHz input, 441.8125 MHz output

Requires amateur radio license and suitable VHF and/or UHF equipment.

Appendix T --- ARDF Procedures

Procedures for the ARDF daily event.

- Each team will be made up of at least two but not more than 8 members.
- Please use common sense, if nine friends show up, let them go. But one person is not acceptable due to the buddy rule. Have them decide on a team name. Such as 'The Searchers of Troop 101'. Always defer to a youth member if possible.
- Time limit on the course is 60 minutes. Please tell each team to be back within 60 minutes. Scoring is zero if they return after this amount of time, regardless of how many foxes (controls) they found.
- No team should leave home base after 7pm. This is because we are only staffing 8am to 8pm. My understanding is that Summit Center closes as 8pm.
- Distribute one receiver with user instructions per team. Remember we only have 5 or 6 units. If a team must wait for the return of another before they can go on the hunt, suggest they visit the demonstration station. Give them a number that we can call for next in line, or just call the team name.
- One member of the team is to be the voluntary responsible party for the hardware. Put his/her name, phone, camp site information, team name, time out and a count of the team members on the log sheet. If you have a mixed adult/youth team, give a youth member this responsibility.
- Give each member of the team a 5x7 score sheet. This will serve as a memento of the event and a reminder of it.
- Take a picture of the team. Lets not worry too much if everyone looks perfect in it, but a team picture would be nice. Advise them this may be posted on the K2BSA Facebook page. If anyone objects, take another picture without them for posting purposes. Use an iPhone/iPad/Android for ease of posting to Facebook.
- Advise the team of the rules and procedures of the hunt. This should include instructions on the hardware both in-hand and in-field. Ideas on how to best proceed to find the devices, and a strong reminder of the time limit. Use the example control and punch to show them what they are looking for and how to use it.
- On their return, be sure to record their time of return as accurately as possible on their score sheet and in the log book. Be sure to show the return of the hardware and have the responsible person, acknowledge it has been returned. Except for purposeful damage we will not be holding anyone responsible for accidental damage.
- Post their team picture and name along with the number of hidden transmitter(s) they found and the total elapsed time on the K2BSA Facebook page. Do NOT note if they went over time (disqualified) only post the time, no editorial. First names only if you post names at all.
- If something goes wrong, the receiver dies or breaks for example, just have the team start over. No loss of time, just a complete redux.

- Scoring: 10 points for each correct control found, 10 additional points if all the correct controls were found. Add 1 point for each minute less than 60 on the course. Feel free to add bonus points as you see fit. For example if a patrol is competing and they use their patrol yell. Or maybe they have a great flag, a great personality, etc. But I suggest you add points 1 at a time to avoid huge scores, which would get complicated. Keep the total to 100 or less.
- Yes, they may come back and do it again. In a new team or the same, the idea is to have fun.

Terminology and Misc.
- The white and orange triangular flags are called "Controls" the punch is called a punch. The hidden transmitter is called the "fox".
- All transmitters should be approximately 750 metes (2460 ft about .5 mile) from the start location. We'll try and organize them in a circle around us.
- Time on course is limited to 60 minutes. This is a change from my original 90 because the course is going to be much easier than I originally thought.

Appendix U --- Balloon Launch Procedures

Pre Launch Checklist

Pre-Flight Checklist
24 hours before expected flight: File HiBall (online form) with FAA

Morning of launch:

- Preliminary go/no-go on launch depending on weather
- Run projection
- Verify communications with chase team
- Verify gas is available and where it is needed
- Verify tracking via big-screens if appropriate (http:aprs.fi)
- Verify arrival of Bill and Bev

Minutes before launch: Final go/no-go

- Check current weather conditions
  - Wind speed
  - Cloud cover or rain
  - Unusual something
- If no-go notify FAA
- If no-go notify chase team

Time of launch:

- Choose helpers to assist with flight below including;
  - Control line guides
  - Equipment layout & cleanup
  - Gas tank attendant
  - Anything else I can think of at the time.

1. Lay out sheets on grass
2. Lay balloon on sheets
    a. Equipment check: screw driver, wrench, duct tape
3. Gas bottles within reach?
4. Attach gas hose to tanks (gas off)
5. Attach nozzle to balloon (gas off)
6. Attach pre-weighed water bottles to balloon
    a. Slip knot of first line around neck of balloon
7. Lay out first line, ring down
8. Lay out second line
9. Attach second line to first line with slip rings
    a. Run two control lines through slip ring of first line
10. Lay out parachute
11. Attach parachute to second line with slip rings
12. Attach spreader ring to parachute
13. Attach third line to spreader ring
14. Attach nearsat to third line
15. Activate & verify telemetry of nearsat (144.390Mhz) & others
16. Turn nearsat off again
17. Fill balloon
18. Fold and tie neck of balloon including first line
19. Disconnect water bottles
20. Queues balloon into the air, do not let go!!
21. Activate & verify telemetry of nearsat (144.99Mhz) & others
22. Activate Camera
23. Countdown & release of balloon
24. Put away equipment & gas bottles
25. Chase

Appendix V --- Lightning and Hazardous Weather Procedures

Appendix W --- Evacuation Procedures

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Acknowledgements