ARRL Standard

Pray for our Troops

God Bless America!

QUA/HAM news

December 2019

CONTENTS

MERRY CHRISTMAS

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Club Station K4KJQ
MARS Station AAV4CAB

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Memorial BBS
145.010 and 145.090

Web Page: http://www.bluegrassars.org
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K4KJQ
146.160/.760

ATV Repeater: KY4ATV
Input: 439.250 // Output: 923.250

WA4HBM
147.765/.165

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QUICKY NOTES

Accessing the Club's web page: <http://www. BluegrassARS. org>.

Telephone Number for the Shack (basement of the Red Cross Building): (859) 231-0974.

Subscribe to ListServ: Send an eMail to: bars- request@lsv.uky.edu; in Subject line type Subscribe plus <your call sign>

Post notes to the Club List Serv:<bars@lsv.uky.edu>.

The December program will be a further discussion on the proposed changes to the club's By-Laws, Election of officers for the club for 2020 and the annual member's auction.

Below you will find the Club's Ebay account for the sale of the surplus equipment. Copy the URL into your browser and take a look at the items we have up for auction.

https://www.ebay.com/sch/bluegrassars/m.html

QUA/HAMnews December 2019

Meeting Notice

Bart Breeding/KB4FEE,
Chair, Newsletter Committee
Bluegrass ARS, Lexington,Kentucky

The general meeting of the Bluegrass Amateur Radio Society, Inc., will be held Monday, December 2, 2019, at 7:30 PM, in Meeting Room B, second floor of the Red Cross Building, 1450 Newtown Pike, Lexington. A Special Director's Meeting will be held at 7:00 pm just before the General Membership meeting.

The program for December will be the election of club officers for 2020, further discussion of the proposed By-Laws changes and the annual auction of items. Bring you items for the auction.

Do you have a topic you would like a program on or a program you would like to present? Do you have a home brewed project you have built? Bring it and show it off! Question? Ask it! Maybe your question isn't one about a Club activity or function, maybe you are having a problem getting some newly acquired equipment set up and operating correctly, or you have an antenna with radiation problems. Regardless of your question, problem, or suggestion, bring it to the Club meeting.

The Club shack is open most Saturday mornings for anyone to operate the Club's stations, or to bring pieces of equipment out to be tuned or checked, or to learn about Amateur Radio, or to just sit around and talk
just drop in, no appointment necessary.
Bluegrass Amateur Radio Society's ham shack is located in the basement of the Red Cross building at 1450 Newtown Pike Lexington, KY 40511. Entrance is down the steps (look for the BARS banner hung on the railing) at the North Side of the building.

Fayette County ARES Coordinator - Sandy Gragg
The Fayette County ARES net has resumed. Remember the Fayette County ARES net every Tuesday at 8:30 pm on the 146.94 repeater.
We are looking for more folks that would help share in the net control. If you would like to Help, contact Sandy KM4PJU, at 859-699-0035

"As we express our gratitude, we must never forget that the highest form of appreciation is not to utter words, but to live by them." "Those who dare to fail miserably can achieve greatly." "The ignorance of one voter in a democracy impairs the security of all." "Do not pray for easy lives, pray to be stronger men."
John F. Kennedy

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T'was the night before Christmas, And all through

two-meters, Not a signal was keying Any repeaters.

The antennas reached up From the tower, quite high, To catch the weak signals
That bounced from the sky.

The children, Tech-Pluses, Took their HTs to bed, And dreamed of the day
They'd be Extras, instead.

Mom put on her headphones, I plugged in the key, And we tuned 40 meters
For that rare ZK3.

When the meter was pegged by a signal with power. It smoked a small diode,
and, I swear, shook the tower.

Mom yanked off her phones, And with all she could muster Logged a spot of the signal
On the DX Packet Cluster,

While I ran to the window And peered up at the sky, To see what could generate
RF that high.

It was way in the distance, But the moon made it gleam - A flying sleigh, with an
Eight element beam,

And a little old driver who looked slightly mean. So I though for a moment,
That it might be Wayne Green.

But no, it was Santa The Santa of Hams. On a mission, this Christmas
To clean up the bands.

He circled the tower, Then stopped in his track, And he slid down the coax
Right into the shack.

While Mom and I hid Behind stacks of CQ, This Santa of hamming
Knew just what to do.

He cleared off the shack desk Of paper and parts, And filled out all my late QSLs
For a start.

He ran copper braid, Took a steel rod and pounded It into the earth, till
The station was grounded.

He tightened loose fittings, Re-soldered connections, Cranked down modulation,
Installed lightning protection.

He neutralized tubes In my linear amp...

(Never worked right before -- Now it works like a champ).

A new, low-pass filter Cleaned up the TV, He corrected the settings
In my TNC.

He repaired the computer That would not compute, And he backed up the hard drive
And got it to boot.

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(continued from page 2, “Twas The Night

**Then, he reached really deep In the bag that he brought, And he pulled out a big box,
“A new rig?” I thought!**

**“A new Kenwood? An Icom? A Yaesu, for me?!”(If he thought I’d been bad
it might be QRP!)**

**Yes! The Ultimate Station! How could I deserve this? Could it be all those hours
that I worked Public Service?**

**He hooked it all upAnd in record time, quickly Worked 100 countries,
All down on 160.**

**I should have been happy, It was my call he sent, But the cards and the postage
Will cost two month’s rent!**

**He made final adjustments, And left a card by the key:
“To Gary, from Santa Claus. Seventy-Three.”**

**Then he grabbed his HT, Looked me straight in the eye, Punched a code on the pad,
And was gone - no good bye.**

**I ran back to the station, And the pile-up was big, But a card from St. Nick
Would be worth my new rig.**

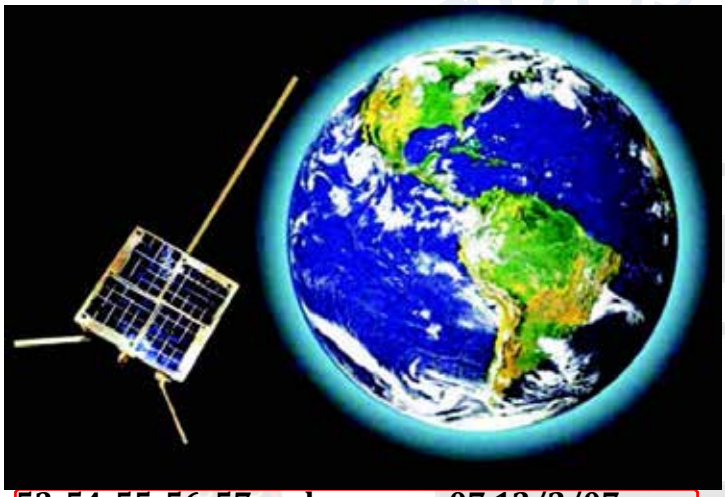
**Oh, too late, for his final came over the air. It was copied all over.
It was heard everywhere.**

**The Ham’s Santa exclaimed What a ham might expect, “Merry Christmas to all,
And to all, good DX.”**


Best Wishes for a
Merry Christmas
CardCow.com

Getting Started In Amateur Radio Satellites

JOHN HEATH
CHESTNUTS, DESFORD LANE,
KIRKBY MALLORY,
LEICS LE9 7QF



53_54_55_56_57_radcom_mar07 12/2/07 10:49 Page 53

WHY SATELLITES? As a class-B licensee under the old rules, I did not have any HF privileges at all. Satellites offered a technical challenge and the possibility to work some serious DX using 2m and 70cm. My first trans-Atlantic contact was achieved on the now-defunct RS-10 using 10W to a small Yagi for the uplink, and a sloping dipole to receive the RS-10 downlink signal in the 10m band. It took several months to achieve this first trans-Atlantic QSO as I needed to build up my operating skills and make improvements to my receive set up. To minimise noise pickup from the house, the antenna went at the bottom of the garden and a homebrew RF pre-amp overcame the cable loss and boosted the signal. It was a great sense of achievement to send and receive signals to and from space and to make that contact via an orbiting satellite. I still get a buzz from communication via a spacecraft.

The satellite community is quite small compared with the number of HF users. When you become a regular on a particular satellite, you quickly make friends on air which makes operating very enjoyable. Some HF old timers tell me that it's like it was on HF many years ago.

If you are new to satellites, you probably have the impression that it's very complicated, needs a degree in science or engineering and costs a small fortune. Whilst it's certainly true that you will be venturing into new territory, satellite operating looks more difficult when explained on the printed page than it is in practice. Keep in mind that satellites are like terrestrial repeaters, with four fundamental differences.

- They are constantly moving, so we need to know where to point our antennas.
- The input and output will be in two different bands.
- Their signals are always drifting rapidly in frequency – the Doppler Shift.
- Communications are full duplex – you must be able to hear your own transmission coming back from the satellite

On the non technical side, but of great importance when you start out, are the following.

- Listen to a few satellite passes to get the hang of how things are done and to check that your receive side is working properly.
- When you try your first contact, be patient, it may take you numerous passes of the satellite before everything comes together for you. Once it does it's like riding a bike.

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SATELLITE GROUPS. There are three basic kinds of satellite, defined by their orbital paths.
LEO – low earth orbit, typically 1000km altitude in a near-circular orbit that passes over the poles
HEO – high elliptical orbit, typically a few hundred kilometres altitude at its closest to Earth, and 40,000km or more at its furthest point. The orbit describes an ellipse.
GEO – geostationary or, more accurately, geosynchronous, typically 37,000km orbits in synchronism with the Earth's rotation, so appearing stationary.
Many of our amateur radio satellites are LEOs and typically take about 100 minutes to complete each orbit. The International Space Station is a special case being a super LEO at only 300km altitude and an orbital period of 91 minutes. Without a regular boost from the supply vessel's rocket motors, the ISS would fall back to Earth.
WHAT'S UP THERE? There are various kinds of satellites to keep in mind.
Amateur Radio Satellites – CW, SSTV, voice, packet, PSK31, APRS and FM – only single-channel satellites for voice.
The International Space Station – voice (with crew members), packet, APRS, (SSTV coming soon).
Cube Sats – Telemetry and scientific data, and possibly a voice transponder on future satellites.
Suit Sat – a discarded space suit equipped with radio gear and deployed from an airlock. SSTV, telemetry, pre-recoded message and possibly a transponder. SuitSat 2 will be probably be launched later this year.
Most amateur radio satellites have beacon transmitters and most send telemetry. Cube Sats also send spacecraft telemetry and scientific data.
Getting started on
amateur radio satellites
COMMUNICATING VIA SATELLITE. The principal bands used are 2m and 70cm. FM satellites are generally phone and/or packet. The SSB satellites carry CW, phone, SSTV and PSK31. The newer generation of satellites can operate on various modes and bands, controlled by the ground station. Most satellites have a beacon transmitter which gives the satellite ID and in general, data about the condition of the satellite and its on-board systems. This is called Telemetry and capturing and studying it can become a major interest.
WHAT RADIOS DO I NEED? Whether you intend to operate portable with a handheld, or from a base station, it's essential that you have full duplex capability. That means that you can hear your own signal coming back from the satellite whilst you are transmitting. This feature is not available on all dual-band radios. An FM radio will enable you to operate through several satellites, AO-51, SO-50, AO-27. A multi-mode transceiver will give capabilities for the SSB satellites as well: AO-7, FO-29, VO-52. Several modern rigs have true dual-band capability on 2m and 70cm. Rigs with a VHF heritage seem to have good features for satellite operating. If you are planning a portable operation, using a dual-band hand-held radio, your choice will be limited, as duplex capability is not a

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common feature of hand-helds. The Kenwood TH-D7 with built-in TNC is full duplex and very useful for satellite voice, packet and APRS. Andy Thomas, G0SFJ, has mounted several mini-DXpeditions with a Kenwood and had good results. Full duplex can be achieved easily of course by using two radios, one for transmit and the other for receive. This may be a cost-effective option and avoids the complication of learning your way around a fully-featured multi-mode. A good receive rig for 70cm and a second-hand 2m rig will get you going and enable you to get some valuable experience before you buy an all-bells-and-whistles radio. This solution is particularly valid for the FM satellites when working portable. The transmit radio on 2m can be set to the uplink frequency, and not adjusted throughout the pass. With 5W to a small hand-held Yagi or quad antenna, it will be easy to access the satellites. Check out the advertisers in RadCom; older style single-band
2m FM handhelds can be purchased new for around £80.

OPERATING HINTS – FM SATELLITES. AO-51 has several operating modes, so you need to know which transponder is on. Check the operating schedule on the AMSAT NA website. SO-50 needs a 67.0Hz CTCSS tone in your transmission to access the satellite. One of the commonest causes of frustration for beginners is the wrong use of the squelch. Keep it fully open, the satellite signal may not be strong enough to open it for you. Use an earpiece or phones, thus preventing you from creating a feedback loop out into space and back. It also makes operating easier. Use a recording device of some sort for logging. On busy single-channel FM satellites, make one or two short contacts then leave the channel for others. With only a 10 – 15 minute operating window, it's antisocial to dominate the satellite. During weekends, the satellites carry a lot of traffic. When starting out, choose satellite passes where mainland Europe is not in the footprint. I have had some very enjoyable contacts with GM and LA under these quieter conditions. Try working the satellite late at night or weekdays during the daytime.

OPERATING HINTS – SSB SATELLITES. AO-7, FO-29 and VO-52 all use SSB and have a pass-band covering several kilohertz. By convention, the lower onethird of the band is used for CW and data modes, leaving the remainder for voice and other analogue modes. Looking at the frequencies for VO-52, the uplink band is 435.220 – 435.280MHz and the corresponding downlink is 145.930 – 145.870MHz (see Table 1). The convention on SSB satellites is to receive on USB and transmit on LSB.

DEALING WITH DOPPLER. The Doppler Effect is usually illustrated by referring to the change in tone of the siren as a police car speeds by. As the vehicle approaches, its speed shortens the wavelength of the signal, so the note seems high. As it goes away the speed of the vehicle increases the wavelength and the note becomes lower. The magnitude of the effect depends on the speed of the vehicle relative to the observer, and the frequency of the signal. The orbital speed of satellites is such that Doppler Shift is very marked, creating the effect of a constantly drifting signal.

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This affects the signal we receive from the satellite, and the signal we send to the satellite. During a contact, we will be adjusting transmit, and receive frequencies constantly by small increments so that we keep our contact on frequency. With a bit of practice this can easily be done manually. With radios that have CAT computer ports, the control can be done by computer and the satellite tracking program. A satellite that orbits at 1000km altitude will be about 1000km away when it passes overhead. On the other hand, the same satellite, if it's near the horizon, will be around 4,000km. If it's that much further away, its speed will appear to be much less; think of an express train viewed in the distance compared with one passing you on the platform. It's all about speed relative to observer. Use this to advantage by practising on low-elevation passes where the effect of Doppler Shift will be less.

With a bit more room to spare on SSB satellites, it's possible to find a quiet spot near the top end of the band and try a few test transmissions. Wear headphones for satellite operating, it makes life easier and avoids creating feedback to the satellite. Whistle [your call sign] and say "Test, test", is perfectly acceptable and can go in the log as a test transmission. This is very useful way to practise operating and staying on frequency. A useful trick is to set the transceiver and receiver to CW and send a few dots, rather than whistle. On my FT-847, I have a footswitch plugged into the key jack. A brief press on the switch gives me a nice CW note to tune up with. Switch to sideband and follow up with your call sign to give that final adjustment.

Table 1 is useful when working the satellite; we can quickly see that if we are listening on 145.900MHz we will need to transmit on roughly 435.250MHz. I say roughly, because the table is constructed at zero Doppler Shift. A few test calls and small frequency adjustments should get you on frequency quickly. Draw up a table for all of the satellites you want to work through. Satellite operators are very tolerant, welcome newcomers and expect a few mistakes, we were all beginners once. You can do your bit by following these suggestions. Please don't whistle like crazy whilst whizzing your transmit frequency up and down the pass-band trying to hear something. It's very antisocial and will trample over other people's contacts. Use the table, pick low-elevation passes for practice and try at less-busy times.

For FM satellites SO-50 and AO-51, Doppler correction is much more straightforward. Since the signal is FM, the onboard receiver's pass-band is wide enough to compensate for Doppler Shift, and the frequency could be set to the nominal frequency for the satellite and not adjusted for Doppler Shift. For the receive frequency, you could program some memories with 5kHz steps. As the satellite comes over the horizon, it will be higher in frequency so the steps might look like this: +10kHz, +5kHz, Nominal Frequency, -5kHz, -10kHz, satellite out of range. When operating, it's a simple matter to click through the memories during the pass to keep a good receive signal.

Table 2 shows the memories for both uplink and downlink.

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Bluegrass Amateur Radio Society (BARS)
General Meeting Agenda December 2, 2019

I. Call meeting to order.
II. Recognition:
a. Welcome and self-introduction of members and visitors.
b. New licensees.
III. Trivia Question: Terry Layman, N6OKR.
IV. Program Presentation: Members' Equipment Auction.
V. Members' news (time permitting).
License upgrades.
Birthdays this month.
Sick-call.
Expeditions and travels.
New equipment, and used equipment for sale or trade.
Moves and relocations.
ARRL and other clubs' news.
VI. Treasurer's report – John Barnes, KS4GL:
1. New membership applications: David Keown, KN4ZIF;
Calvin Smith, KN4ZJI;
Ken Johnson, KN4ZIE
2. Financial.

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Program Schedule for 2019

David Richardson/W9KHZ, Chair, Program Committee
Bluegrass ARS, Lexington, Kentucky

The following programs are scheduled for 2019. Your input and suggestions for programs for 2019 are needed. Call David Richardson,W9KHZ at 869-983-1380 or e-mail at daveinlex3@gmail.com/.

	Month	Topic	Presenter(s)	Comments
✓	January	"Winter Field Day" January 26-27, 2019	David Richardson/W9KHZ	
✓	February	CERT Program	Shelly Bendall LFUCG	
✓	March	SkyWarn National Weather Service, Louisville, KY	Joe Sullivan	
✓	April	Portable Go-Kit	David Richardson/W9KHZ	
✓	May	Antenna Theory and Design	Bill Fuqua/WA4LAV	
✓	June	"ARRL Field Day" June 22-23, 2019	David Richardson/W9KHZ	
✓	July	Lightening Protection	Jim Bacher	
✓	August	"Hamfest" August 10, 2019	David Richardson/W9KHZ	
✓	September	Annual Family Picnic	Bill DeVore	Shelter#4, Shillito Park, LEX
✓	October	Discussion of By-Laws and SOP changes		
✓	November	Report of Nominating Committee	Additional discussion on By-Laws and SOP	
	December	"Annual Auction"/Election	Andrew Cook	

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TABLE 1: Uplink and downlink frequencies for VO-52.
Beacon 1 145.936MHz carrier
Rx (MHz) USB Tx (MHz) LSB
145.930 435.220
145.928 435.222
145.926 435.224
145.924 435.226
145.922 435.228
145.920 435.230
145.918 435.232
145.916 435.234
145.914 435.236
145.912 435.238
145.910 435.240
145.908 435.242
145.906 435.244
145.904 435.246
145.902 435.248
145.900 435.250
145.898 435.252
145.896 435.254
145.894 435.256
145.892 435.258
145.890 435.260
145.888 435.262
145.886 435.264
145.884 435.266
145.882 435.268
145.880 435.270
145.878 435.272
145.876 435.274
145.874 435.276
145.872 435.278
145.870 435.280
At zero Doppler Shift

TABLE 2: Memory settings for AO-51.
Memory Rx Tx
AOS 1 145.890 435.250
2 145.885 453.275
TCA 3 145.880 435.300
4 145.875 435.305
LOS 5 145.870 435.310
AOS = Acquisition of signal
TCA = Time of closest approach
LOS = Loss of signal

ANTENNAS AND FEEDERS. A frequentlyasked question is 'What antennas do I need for a home station?'. Here are some hints and tips based on my own operating experience, and from fellow enthusiasts. One of the best pieces of advice is to put money and effort into the receive part of your satellite ground station. It will pay off handsomely.
The main frequencies in use for the Satellite Service are:
144 – 146MHz, ground stations and satellites
435 – 438MHz, ground stations and satellites
1260 – 1270MHz, Earth to Space only
2400 – 2450MHz, ground stations and satellites
Several satellites, either in orbit or in the planning/building stages, will carry experimental payloads using higher frequencies. See 'Web Search' at the end of this article for URL's that give full details.
The ground station system should be looked at as a whole, not just the antenna. Careful consideration is needed to decide on the most suitable feeder and connectors. If you anticipate having long runs of feeder cable, you will need to make some estimates of signal losses. Here are some typical loss figures for 30m of cable expressed as attenuation in dB.

Cable	Loss at 100MHz(dB)	Loss at 1000MHz(dB)
RG-213	2.26	8.0
Westflex 103	0.85	2.7
EchoFlex 15	0.28	2.9

(Source: RSGB Radio Communication Handbook 8th Edition, Appendix A)
The transmit side is seldom a consideration.

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Modern rigs have plenty ofpower available at 146 and 436MHz so afew dB cable loss can easily be made up byincreasing the transmit power. Also in ourfavour, receivers on the satellites are verysensitive, so just a few watts to a small beamantenna will produce plenty of contacts.Feeder loss is particularly important onthe receive side as the relatively weak signal from the satellite will be attenuated in the feeder leaving you with a very little signal at the shack, and consequently a very poor signal-to-noise ratio. The practical consequence of this is that stations are difficult to hear and what would have been a pleasant contact with a 56 signal report is spoiled. If you have >30m feeder runs, you will probably need to install a masthead preamplifier (see below).

Use good quality connectors. N-type is preferred as it is low-loss, mechanically strong and, if fitted carefully, is watertight. Take extra time and attention to fit connectors very neatly, spreading out the braid evenly and taking care to cut everything to the recommended lengths. A well set-up system will last 10 years or more. For receive-only applications, lowloss satellite TV cable saves cost and performs very well.

Combined azimuth and elevation control for the antennas is far from essential; you will be able to do some space radio with simple fixed verticals, but results will be much better with small beam antennas that can be rotated in azimuth. Tilt the antennas so that they point upwards by about 15°, and you will be able to work all but the highest-elevation satellite passes.

Recently, I checked 100 consecutive passes of AO-51 from my home. 34% did not rise more than 10°above the horizon. 42% were between10° and 30°. Only 8% were above 70°. Keep in mind that the best DX is available when satellites are low to the horizon. The situation will be different when the HEO satellites – AMSAT NA's Eagle and AMSAT DL's P3E – are in orbit. For these satellites, some elevation capability will be an advantage. Avoid very high-gain antennas as used by terrestrial DXers. The high-gain figures are attractive, but this comes with a correspondingly large antenna and narrow beamwidth. A narrow beamwidth antenna must track the satellite very accurately across the sky, otherwise the signal will be lost. Smaller, lower-gain antennas have benefits. A four-element cubical quad, or a quagi, is easy to make, will have about 10dB of gain and can be used with a lowcost TV aerial rotator costing about £40. If using masthead pre-amplifiers on 2m and 70cm, don't pay a lot of money for amplifiers with very high gain figures. You only need enough gain to offset losses in your coax feeder and improve the system noise figure. If static doesn't fry the first device in the pre-amp then it's almost certain that at some stage you will accidentally send RF up the wrong feedline. Simple pre-amplifiers, in which you can replace the front end device yourself, are ideal. A problem often faced by satellite newcomers is receiver desensitisation (commonly called 'desense'). Here is what happens. When working satellites, we are using full duplex. We can hear our own signal coming back from the satellite while transmitting. For some satellites – FO-29 is a good example – the uplink frequency (our transmit) is in the band 145.900MHz – 146.000MHz. The signal received from the satellite is between 435.800 – 435.900MHz. 145.950MHz, ie 437.875MHz.

With, say, 20W to a beam which is in close proximity to our receive antenna

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its easy to see that even with a third harmonic at -60dB the sensitive front-end of the receiver can easily be overloaded, making it very difficult to copy the signal from the satellite. De-sense can affect pre-amps as well as receivers. There are several remedies, some or all of which may be needed and will require some trial and error as the circumstances of each station will be different.

The first, and simplest, is to reduce your transmitter power. Satellite operators are often guilty of running more power than necessary. Secondly, try increasing the separation between the transmit and receive antennas. If an even more robust solution is needed, there are several good designs for small cavity filters made with copper tube and N-connectors. If you have workshop skills, these will give a good rejection figure.

An even simpler solution uses coax cable stubs as filters, with the simplest method of all being to use a commercial duplexer (diplexer) at the antenna. The Common port is connected to the 70cm receive antenna. The 2m port is terminated with a 50Ω load. The 70cm port goes to a pre-amplifier or to the shack. This is fully explained on the AMSAT NA website together with the diagram shown in Figure 1; the COMET CF-416C duplexer is said to work well. Duplexers are not waterproof, so you will need to arrange some sort of cover or box.

Text books recommend circular polarisation for space communications as it helps to reduce fading caused by reflections. Many of the satellites have transmit antennas which produce circular polarisation.

Having the corresponding circular polarisation at the ground station is the ideal to aim for, but it's not essential. Most of the stations I work on the satellites are using linearlypolarised antennas. If you do use circular polarisation, make sure your antenna is compatible with the satellite – right hand (RHCP) or left hand (LHCP) – otherwise you could have 60dB of loss. For transmitting to the satellite, and receiving the downlink, circular polarisation is generally used at the higher frequencies of 1.2GHz, 2.4GHz and upwards. Take care with RHCP and LHCP when making dish feeds. The polarisation of the signal reflected from the dish will be the mirror image of the incoming signal. You can homebrew some great antennas for satellite working. Quads, Yagis and quagis for 2m and 70cm are easy to make and are reproducible. A simple twoelement quad for 436MHz made with thick wire will receive the downlink from a whole range of satellites. Helical antennas and patch antenna are good for 1.2GHz and 2.4GHz and there are plenty of good homebrew designs around.

Put any of the following call signs into your browser to find good practical designs that have been tested on antenna ranges or live on satellites: G6LVB, K5OE, W0LMD, G3RUH.

G6LVB's site has a very good construction article for building a hand-held dual-band Yagi designed for working the FM satellites with a 5W hand-held transceiver (final product shown in the photograph).

K5OE's site has some easy-build 'Texas Potato Masher' designs based on PVC pipe (see the photograph).

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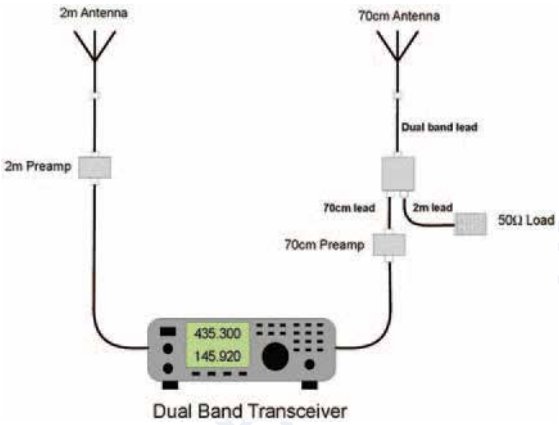
Figure 1



Other interesting antenna construction sites include WA5VJB and VE3CVG. Check out the design frequencies for the antennas on these sites. Many of the Yagi designs are optimised for terrestrial DX at 432MHz. For satellite use, a design frequency of 436MHz is best. Quads are less frequency-critical. For VHF/UHF homebrewers, the quagi is well worth looking at as it combines the simple mechanical design of the Yagi with the increased bandwidth of the quad.

An important point for home construction when making Yagis and other multi-element antennas. A design may give the spacing between elements, don't be tempted to mark it out from element to element. Work from a fixed point such as the driven element, otherwise your measuring errors will accumulate and reduce the performance.

GOOD OPERATING PRACTICE. I regard my license and the access it gives me to the bands as a privilege. I also feel a duty to uphold the fine amateur radio traditions of gentlemanly conduct when operating. After all, this is a shared resource, and especially so on satellites. The easy-towork FM satellites do get rather chaotic at weekends as everyone is trying to make contacts on just one channel. I am happy to say that, in contrast, operating manners are good on the other satellites and we can all play a part in keeping it that way.

WHAT NEXT? Log on to the AMSAT-NA website and get the frequency details for FM or SSB satellites depending on your available equipment. Find the information by clicking on 'Sat Status' in the top navigation bar. When you get the status page click on the name of the satellite in which you are interested.

Have your latitude and longitude (or your grid locator) ready and go to the 'Passes' section of the website, (it's in the navigation bar along the top of the home page) or go to the Heavens Above website. This will give you the next few passes for the satellite of your choice.

Study the passes and pick those that look favourable for your location. Check to see which direction gives the best view of the sky for your antennas. Look to see if the satellite will be obscured by trees or buildings. Probably go for passes with about 20 – 30° of elevation.

Check that your shack clock is accurate to about 20 seconds or better. Make sure the time zone is right. All satellite work is done in UTC.

A few minutes before the pass, point your antenna towards the direction of the satellite and tune your receiver to the satellite beacon frequency +10kHz (approximately). Tune gently back and forward around this frequency until you hear the beacon (or contacts in the case of FM satellites, squelch fully open). Remember to move your antenna as the satellite comes over.

(continued on page 14)

(continued from page 13, Getting Started)

Having heard your first signals from space you are on your way to your first contact. Have a celebratory cup of tea and join AMSAT-UK so that you can be part of the international AMSAT community which designs, builds, funds and launches satellites for all radio amateurs to enjoy.

TIPS FOR COPYING SATELLITES. Here are my tips for working satellites, divided according to the equipment you're using.

• FM hand-held or base station that can tune 137 – 138MHz. This is the downlink for the NOAA series of American weather satellites. Signals are strong and have a distinctive tick-tock sound like a clock. There are several, and they pass over the UK several times a day. They are easily copied, even with 2m-band antennas. More information at the GEO website.

• FM hand-held with 70cm. SO-50 and AO-51 should be easy to copy with a small hand-held Yagi outdoors. AO51 is sometimes switched to other bands, so check the AMSAT website for the current operating schedule.

Hand-held with wide-band receive. Try some of the suggestions below for base station multi-modes, Listening outdoors with a hand-held antenna.

• 2m and 70cm Muti-mode. Assuming that you have steerable antennas for terrestrial work, you should copy most satellites at low elevation. Check the predictions for suitable low-elevation passes that won't have the satellites signal path obscured by trees or buildings.

The VO-52 beacon is a strong carrier on around 145.936MHz. Contacts will be heard around 145.900MHz USB.

FO-29 has a CW beacon on 435.795MHz, with contacts around 435.850MHz USB. Signals are weaker than those of VO-52.

LO-19 has a CW beacon on 437.125MHz. It runs at about 750mW and should be easy copy with any small outdoor Yagi. If you have a suitable radio but only a VHF/UHF 'white stick' colinear or other omnidirectional antenna, don't give up. It's worth listening, although signals will be well down on what you could expect from a small Yagi. Look for passes that put the satellite signal in the best part of the maximum lobe of your antenna. Two UK stations with omni directional antennas received the recent test transmissions of SSTV from the International Space Station.

TO RECAP. All the frequency tables show the nominal frequency. Tune above that frequency at the start of the pass, as the satellite approaches. As it passes you tune slowly LF to follow the signal. This frequency drift is the sure sign you are listening to a signal from a fast-moving source (a spacecraft). If the signal is steady, it's probably terrestrial or a spurious signal in your receiver. Be patient, it may take you a few attempts to hear your first signals from space. If you don't seem to be succeeding make sure you have accurate time in your shack. Be prepared to listen carefully and tune around on either side of the anticipated frequency; the signal may be weak on your setup.

AND FINALLY. As a raw beginner, I had lots of advice from experienced satellite users, for which I was most grateful. Similarly, I will be happy to answer any email or postal request from RadCom readers for advice on any aspect of setting up a satellite station.

TREASURER'S REPORT
Respectfully submitted by John Barnes/KS4GL, Treasurer
BLUEGRASS AMATEUR RADIO SOCIETY, INC.
INCOME, EXPENSES, AND ACCOUNT BALANCES
as of October 31, 2019

INCOME:	Checking Account	PayPal Account	Savings Account	Total
ARRL Dues	0.00	0.00	0.00	0.00
BARS Dues	0.00	0.00	0.00	0.00
Coax/Repeater	0.00	0.00	0.00	0.00
Donations	0.00	0.00	0.00	0.00
Education	0.00	0.00	0.00	0.00
Hamfest	0.00	0.00	0.00	0.00
Interest	2.55	0.00	0.04	2.59
Sales Tax	0.00	0.00	0.00	0.00
Miscellaneous	0.00	0.00	0.00	0.00
Total	2.55	0.00	0.04	2.59

EXPENSES:			
ARRL Dues	0.00		0.00
Coax/Repeaters	0.00		0.00
Donations	0.00	73.70	73.70
Education	0.00		0.00
Election	0.00		0.00
Equipment	0.00		0.00
Field Day	0.00		0.00
Hamfest	0.00		0.00
Insurance	0.00		0.00
Miscellaneous	94.66		94.66
Newsletter	0.00		0.00
Picnic	77.01		77.01
P O Box	0.00		0.00
Sales Tax	0.00		0.00
Telephone	0.00		0.00
Total	171.67	73.70	245.37

ACCOUNT BALANCES

	September 30, 2019	October 31, 2019
Checking Balance*	11466.94	11297.82
PayPal Balance	3630.36	3556.66
Savings Balance	201.22	201.26
Total Balance	15298.52	15055.74

*** Fund-specific balances in Checking Account**

General	9084.58	8915.46
Coax/Repeater	804.98	804.98
Education	1577.38	1577.38
Total Checking	11466.94	11297.82

Bluegrass Amateur Radio Society (BARS)
General Meeting Minutes of November 4, 2019
Red Cross Building, Lexington, Ky.

The November, 2019, BARS General Meeting was called to order at 7:31pm by President Andrew Cook, KF4OWP.

Self-introductions were made by eighteen(18) licensed members and one non-licensed life member in attendance, which composed quorum.

Program:

Secretary Bruce Campbell, KM4EHU, reviewed the voting rules for the election of the 2020 officers. The ballots will be mailed with an addressed return envelope to all members on the current roster whose dues are paid for 2019 calendar-year as of the end of the General Meeting on November 4th. The ballots must be received in the sealed addressed return envelope either by mail or hand delivered no later than 7:30pm at the beginning of the General meeting on December 2nd.

Club and Members' News.

Roger Colvin, KJ4YSY, has upgraded his license to Extra class.

Treasurer's Report – John Barnes, KS4GL.

1. The membership application for Chris Dudley, W4DUD, that was accepted by the Board of Diretors at their October meeting was presented. David Richardson, W9KHZ, moved and Brad James, WA4HBM, seconded for approval which passed without objection.
2. The summary treasurer's report based on records before receipt of the October bank statements of amounts in accounts as of October 31, 2019, are:

Checking account:		
General fund:	$8,912.91	
Coax/repeater:	804.98	
Education:	1,577.38	$11,295.27
PayPal account:		
	3,630.36	
Savings account:		
	201.26	
Total balance of accounts:		$15,126.89

David Richardson, W9KHZ, moved and Tim Kunkel, KF4MPM, seconded for acceptance of the Treasurer's report which was approved without objection.

Committee Announcements.

Contest – Pete Kragh, K2UPD: (no announcements).

Education – Bill Fuqua, WA4LAV: The Saturday special topics
classes be held when there is interest in particular projects.

Emergency Preparedness - Sandy Gragg, KM4PJU. Nothing to announce.

Hamfest – David Richardson, W9KHZ: Nothing to announce.

Newsletter – Bart Breeding, KB4FEE: Nothing to announce.

Program – David Richardson, W9KHZ:
The November program will be:
1) "Elections for 2020 Officers",
2) Members' Equipment Auction.

Public Relations and Membership – Bart Breeding, KB4FEE: Nothing to announce.

Repeater – Andrew Cook, KF4OWP: Bill Fuqua, WA4LAV, reported
that the duplexers have been re-tuned and will be re-installed shortly. Also the broken antenna bracket will be considered for repair. In addition a letter of thanks be sent by BARS to Southern Communications for their continuing assistance with maintenance for the repeater system.

Shack – David Richardson, W9KHZ: Antenna maintenance activities
are continuing on Saturday mornings as weather permits.

Volunteer Examinations – Fernie Williams, KE6MAI: (no report)

Historian - Bill DeVore, N4DIT: Nothing to announce.

Librarian – John Barnes, KS4GL: Nothing to announce.

MARS – Harvey Fry, AA4HF, and Barry Jackson, WB4N: (no report)

Trustee: Shack – Andrew Cook, KF4OWP: David Richardson, K9KHZ,
will assume the club license Trusteeship as the FCC Form-605's are processed.

(continued on page 17)

(continued from page 16, General Meeting)

VHF Repeater – Andrew Cook, KF4OWP: Nothing to announce.
Bylaws – Andrew Cook, KF4OWP: Secretary Bruce Campbell, KM4EHU,
announced that the current proposed revisions of the existing Bylaws is to be submitted to the membership for the first reading at this meeting under new business.
Also, the formulation of BARS Standard Operating Procedures is a continuous process, and input for guidelines for BARS operations is open for any BARS members.
Special Interest Groups News.
(none)
Old Business.
The storage facility for the donated equipment is now the full responsibility of BARS until the donated equipment is finally disposed of.

New Business.
1) Roger Colvin, KJ4YSY, and Loretta Colvin presented the slate of candidates for the election of the club officers for 2020.
President: Brad James, WA4HBM;
First Vice President: Bob Brown, KI4JVK;
Second Vice President: David Richardson, W9KHZ;
Secretary: Bruce A. Campbell, KM4EHU;
Treasurer: John Barnes, KS4GL;
Directors-at-Large: Tim Kunkel, KF4MPM;
Bill Fuqua, WA4LAV.
Hearing no other additional recommendations for the 2020 officers the nomination were closed by general consent.
2) The first reading of the proposed Bylaw revisions recommended by general consent the following changes:
a. The minimum ages for the officers' positions will remain at twenty-one(21) for the President and Treasurer and be changed to eighteen(18) for the two Vice Presidents, the two Directors-at-Large, and the Secretary, if the club's liability insurance policy allows any of the elected officers to be under the age of twenty-one(21).
b. The Trustee is required to hold at least a General Class license and is specified as the effective control operator of the radio stations owned and licensed by BARS.

Sandy Gragg, KM4PJU, moved and John Barnes, KS4GL seconded that the proposed Bylaws with the above changes be placed on the December Ballot for acceptance to go in effect on January 1st, 2020, by general vote along with the officers' elections.
The motion passed with twelve(12) affirmative votes and four(4) votes in opposition of the sixteen(16) voting members still in attendance.
Brad James, WA4HBM, moved and Jodie Wells, WB4LKQ, seconded that the approved motion be reconsidered
pending further debate which was approved by a twelve(12) to four(4) vote.
Jodie Wells, WB4LKQ, moved, and John Frost, AK2T, seconded that the original motion be rescinded for more appropriate wording which was approved by a twelve(12) to four(4) vote.
Mark Elliott, KN4HVX, moved, and David Richardson, W9KHZ, seconded, that the proposed changes be written into the Bylaws revisions for another review of the document as a whole and again submitted to the membership for a subsequent second reading, which was approved by a majority vote of twelve(12), with two(2) opposed and two(2) abstaining.

With no other discussions at pm, 9:13pm Bob Brown, KI4JVK, moved and Tim Kunkel, KF4MPM, seconded that the meeting be adjourned which was unanimously approved.

The next BARS scheduled meetings and activities:
BARS General Meeting: Monday, December 2nd, 7:30pm.
Program: 1) 2020 Officer Elections.
2) Members' Auction.
Directors' Meeting: Monday December 16th, 7:30pm.
BARS General Meeting: Monday, January 6th, 7:30pm.

Program: (tba)
Directors' Meeting: Monday December 20th, 7:30pm.
Recorded and submitted by:
Bruce A. Campbell, KM4EHU
Secretary

Bruce Draper, AA5B, aa5b.corral@gmail.com

Contest Corral December 2019

Check for updates and a downloadable PDF version online at **www.arrl.org/contests**.
Refer to the contest websites for full rules, scoring information, operating periods or time limits, and log submission information.

Start - Finish Date-Time		Start - Finish Date-Time		Bands	Contest Name	Mode	Exchange	Sponsor's Website
3	0200	3	0400	3.5-28	ARS Spartan Sprint	CW	RST + SPC + Power	arsqrp.blogspot.com
5	0000	5	0300	1.8	QRP ARCI Topband Sprint	CW	ARCI: RST + SPC + ARCI No.; non-ARCI: RST + SPC + power	qrparci.org/contests
5	1800	5	2200	28	NRAU 10-Meter Activity Contest	CW Ph Dig	RS(T) + 6-char grid square	www.nrau.net
5	2000	5	2200	1.8-50	SKCC Sprint Europe	CW	RST, SPC, name, mbr or power	www.skccgroup.com
6	2200	8	1600	1.8	ARRL 160-Meter Contest	CW	W/VE: RST, ARRL/RAC Section; DX: RST	www.arrl.org/160-meter
7	0500	8	1000	3.5-28	UFT Contest	CW	RST, mbr or "NM"	www.uft.net
7	0600	7	0800	7, 14	Wake-Up! QRP Sprint	CW	RST, serial, suffix of previous QSO	qrp.ru/contest/wakeup/333-wakeup-eng
7	1200	8	2359	1.8-50	SKCC Weekend Sprintathon	CW	RST, SPC, name, mbr or "none"	www.skccgroup.com
7	1600	8	1559	3.5-28	International Naval Contest	CW Ph	RS(T), mbr or serial	www.rnars.org.uk
7	1600	8	1559	3.5-28	PRO CW Contest	CW	RST, serial, "/M" if member	procwclub.ro/TAC%20Rules.html
7	1800	8	2359	3.5-28	FT8 Roundup	Dig	RST, state or province/territory or serial (if DX)	www.rttycontesting.com
7	2000	8	1959	3.5-28	EPC Ukraine DX Contest	Dig	RSQ, Ukraine Admin Region or serial	epc-ukraina.ucoz.com
8	2000	8	2300	1.8-28	QRP ARCI Holiday Spirits Homebrew Sprint	CW	RST, SPC, mbr or power	qrparci.org/contests
9	0100	9	0300	1.8-28	4 States QRP Group Second Sunday Sprint	CW Ph	RS(T), SPC, mbr or power	www.4sqrp.com
11	0130	11	0330	3.5-14	NAQCC CW Sprint	CW	RST, SPC, mbr or power	naqcc.info
14	0000	15	2359	28	ARRL 10-Meter Contest	CW Ph	W/VE: RST + State/Province; XE: RST + State; DX: RST + serial	www.arrl.org/10-meter
14	0000	16	2359	1.8-7	PODXS 070 Club Triple Play Low Band Sprint	Dig	RST, SPC	www.podxs070.com
14	0600	15	1800	3.5-28	TRC Digi Contest	Dig	RST, serial, "TRC" if member	www.trcdx.org/trcdxc
15	2100	15	2259	14	CQC Great Colorado Snowshoe Run	CW	RST, SPC	www.coloradoqrpclub.org
16	0200	16	0400	1.8-28	Run for the Bacon QRP Contest	CW	RST, SPC, mbr or power	qrpcontest.com/pigrun
18	0130	18	0330	3.5-14	NAQCC CW Sprint	CW	RST, SPC, mbr or power	naqcc.info
20	1600	20	1700	3.5, 7	AGB-Party Contest	CW Ph Dig	RST, serial, mbr (if member)	www.ev5agb.com
20	2000	20	2359	1.8	Russian 160-Meter Contest	CW Ph	RS(T), Oblast code or serial	www.qrz.ru/contest
21	0000	21	2359	1.8-50	Feld Hell Sprint	Dig	RST, mbr, SPC, grid	sites.google.com/site/feldhellclub
21	0000	21	2359	3.5-28	OK DX RTTY Contest	Dig	RST, CQ zone	okrtty.crk.cz
21	1200	22	1159	3.5-28	Padang DX Contest	Ph	RS, serial	padangdxc.com
21	1200	22	1159	3.5-28	Gedebage CW Contest	CW	RST, serial	olkb.or.id
21	1400	22	1400	1.8-28	Croatian CW Contest	CW	RST, serial	9acw.org
22	0000	22	1159	3.5-28	RAEM Contest	CW	Serial, latitude, longitude	raem.srr.ru/en/main
22	1800	22	2359	3.5-28	ARRL Rookie Roundup, CW	CW	Name, 2-digit year first licensed, state/province/XE area/DX	www.arrl.org/rookie-roundup
25	0000	25	0200	1.8-28	SKCC Sprint	CW	RST, SPC, name, mbr or power	www.skccgroup.com
26	0830	26	1059	3.5, 7	DARC Christmas Contest	CW Ph	RS(T), DOK or serial	darc.de/der-club/referate/conteste/weihnachtswettbewerb/en
28	0000	28	2359	1.8-144	RAC Winter Contest	CW Ph	RS(T), province/territory or serial	wp.rac.ca
28	1500	29	1500	1.8	Stew Perry Topband Challenge	CW	4-char grid square	www.kkn.net/stew
28	1500	29	1500	3.5-14	Original QRP Contest	CW	RST, serial, power category	qrpcc.de/contestrules
30	1300	31	0400	1.8-28	QCX Challenge	CW	RST, name, SPC, rig	qrp-labs.com/party.html
31	0900	31	2359	3.5, 7	Bogor Old and New Contest	Ph	RS, operator age	www.orari-bogor.org

All dates refer to UTC and may be different from calendar dates in North America. Contests are not conducted on the 60-, 30-, 17-, or 12-meter bands. Mbr = Membership number. Serial = Sequential number of the contact. SPC = State, Province, DXCC Entity. XE = Mexican state. Listings in blue indicate contests sponsored by ARRL or *NCJ*. The latest time to make a valid contest QSO is the minute listed in the "Finish Time" column. *Data for Contest Corral is maintained on the WA7BNM Contest Calendar at* **www.contestcalendar.com** *and is extracted for publication in* QST *2 months prior to the month of the contest. ARRL gratefully acknowledges the support of Bruce Horn, WA7BNM, in providing this service.*

(continued from page 9, Agenda December 2, 2019 meeting)

VII. Old Business.
a. Donated equipment status.
b. Antenna maintenance activities.
c. Open discussion.
VIII. New Business:
a. Elections of Officers for 2020.
b. Second Reading of Revised Bylaws.
c. Open Discussion.
IX. Committee chair comments and announcements: (time permitting)

Contest – Pete Kragh, K2UPD.
Education – Bill Fuqua, WA4LAV.
Emergency Preparedness – Sandy Gragg, KM4PJU.
Hamfest – David Richardson, W9KHZ.
Newsletter –Bart Breeding, WB4FEE.
Program – David Richardson, W9KHZ.
Public Relations and Membership – Bart Breeding, WB4FEE.
Repeater – Andrew Cook, KF4OWP.
Shack – David Richardson, W9KHZ.
Volunteer Examinations – Fernie Williams, KE6MAI.
Historian – Bill DeVore, N4DIT.
Library – John Barnes, KS4GL.
MARS – Harvey Frye, AA4HF; Barry Jackson, W4BN.
Trustee: David Richardson, W9KHZ.
Bylaws – Andrew Cook, KF4OWP.

X. Special Interest Groups and Service Groups comments and announcements: (time permitting)
XI. Trivia Question Results.

XII. Next BARS Meeting Schedules (at Red Cross Building, Newtown Pike, Lexington, Ky.):
December 16th, 7:30pm - Directors' Meeting.

January 6th, 7:30pm - BARS General Meeting . Program: Winter Field Day.
January 20th, 7:30pm – Directors' Meeting.

XIII. President's comments and announcements.

XIV. Motion for adjournment.

"A primary object should be the education of our youth in the science of government. In a republic, what species of knowledge can be equally important? And what duty more pressing than communicating it to those who are to be the future guardians of the liberties of the country?"

— George Washington

Bluegrass Amateur Radio Society (BARS)
Directors' Meeting Report of November 18, 2019
Red Cross Building, Lexington, Ky.

The November, 2019, Directors' Meeting was not convened due to lack of quorum.
In attendance were:
2nd Vice President – David Richardson, W9KHZ;
Treasurer – John Barnes, KS4GL;
Secretary – Bruce Campbell, KM4EHU.
1st Vice President Bill Fuqua, WA4LAV, was available by phone connection.
In addition, Bill Weaver, WE5P, Brad James, WA4HBM, and MARS Representative Harvey Frye AA4HF were present.

Treasurer's Report – John Barnes, KS4GL.

1. **Three new membership applications were received in November.**
2. **Bank account statements for the month ending October 31, 2019, indicate:**

Checking account:		
General fund:	**$8,915.46**	
Coax/repeater:	**804.98**	
Education:	**1,577.38**	**$11,297.82**
PayPal account:		**3,556.66**
Savings account:		**201.26**
Total balance of accounts:		**$15,055.70**

3. **Excessive balances in the PayPal account from sales of donated equipment through E-bay will be moved to the regular bank accounts.**

Secretary Bruce Campbell, KM4EHU, reported that eighty-four(84) 2020 Officer Election Ballots were mailed on Wednesday, November 13th, to seventy-five(75) addresses of BARS members whose paid dues were current through calendar-year 2019.

Other topics of discussion were:

1. **Bill Fuqua's, WA6LAV, Thursday evening Technical workshop will include receiver and transmitter technical evaluations.**
2. **David Richardson, W9KHZ, and Bart Breeding, KB4FEE, will be planning the next Technician Class License study sessions for the Spring in 2020.**
3. **Bill Fuqua, WA4LAV, reported that the repeater receive sensitivity is below its expected value.**
4. **The storage unit for the donated equipment has been transferred into Treasurer John Barnes's, KS4GL, name, and will be paid directly by BARS rather than by reimbursement.**
5. **David Richardson, W9KHZ, discussed preliminary ideas for Winter Field Day on Saturday, January 25, 2020.**
6. **Bruce Campbell reviewed the changes to the proposed Bylaws submitted at the November Open General Meeting.**
7. **The group discussed the merits of members or visitors under eighteen(18) years of age to attend BARS functions without designated adult guidance.**

The officers present decided to call for a Special Open Directors' Meeting on Monday, December 2, 2019, at 7:00pm before the regular scheduled Open General Meeting to:

1. **formally accept the November Treasurers' report'**

and,

2. **formally accept the new applications for membership,**

for presentation at the Regular Meeting
Recorded and submitted by:

Bruce Campbell, KM4EHU
Secretary

Meeting Schedules for Area Clubs, Exam Sessions, etc.

Volunteer examinations are held in or near Lexington on a schedule that has tests in central Kentucky every month of the year. Schedules for area sessions, plus meetings, etc., are as follows:

The Bluegrass Amateur Radio Society, Inc. (Lexington) - (Fernie Williams/KE4MAI (ARRL - $15.00) and Margie Williams/KE4MAJ(WCARS- $10.00)), with Darrell/AC4YD in Winchester and Richmond (W5YI), John/K4FT in Danville (ARRL), and Ron/WX4GPS in Georgetown (ARRL - $15.00), have a schedule to offer an exam monthly in Lexington/central Kentucky. (See schedules on page 10 of this newsletter). ARRL sponsored tests are held the second Saturday of the month, 10:00 AM in the Red Cross Building, Meeting Room "B", 1450 Newtown Pike, Lexington (except the August session is the Saturday of the second weekend of the month and is held at the site of the Central Kentucky ARRL Hamfest), and WCARS sponsored sessions are held the third Tuesday of the scheduled month, 7:00PM in Meeting Room "A" in the Red Cross Building, 1450 Newtown Pike, Lexington. Contact Margie/KE4MAJ at 859-489-6274 or email to ke4maj@arrl.net. Go to <http://www.lexkywcars.org> for information.

Winchester (W5YI VEC) - They are located in the Clark County EOC, 200 Maryland Avenue, Winchester, Kentucky. Their 2019 schedule (10:00AM): Saturday, January, 12, Saturday, April 13, Saturday, July 13, and Saturday, October 12. Contact Liaison Darrell Epperson/AC4YD, AC4YD@arrl.net, 859-771-1834

Danville (ARRL VEC) - Test sessions are fourth Saturday in January, April, July and October at 10:00 AM. Liaison John Wulf/K4FT, johnk4ft@gmail.com, 563-505-0339, Wilderness Road Amateur Radio Club, American Legion Post 46, 45 Spears Lane, Danville,KY 40422 - Repeater 145.310 (100 pl).

Georgetown (ARRL VEC) - Liaison Ron Malinowski/WX4GPS, wx4gps@arrl.net, 502-542-8252, Georgetown Police Dept, 550 Bourbon St., Georgetown (for dates see schedule on page 4 of this newsletter).

Radio Theory and Construction Workshop - Each Saturday 1:00-3:00 PM in the Bluegrass ARS Education Center, basement of the Red Cross Building, 1450 Newtown Pike, Lexington. Contact Bill Fuqua/WA4LAV at (859) 272-9523 or wa4lav@arrl.net.

Versailles/Woodford County - The Woodford County Amateur Radio Club meets the first Wednesday of each month at 7:00 PM in the Versailles Fire Station No. 2 on Big Sink Pike (38°3'34" N 84°43'11"W). Anyone interested in amateur radio is cordially invited. Also, visit their web site at <http://www.ky4wc.org>. You may contact Todd Rose/KE4YAH (atrose@ windstream.net).

Fayette County ARES Net - Tuesday, 8:30 PM, 146.940 (-600 Tone 88.5) repeater.

Amateur Television and Specialized Communications Net
- An informal meeting is held every Sunday evening at 9:00 PM (local time) on the 146.760 (-600 offset) repeater in Lexington.

Kentucky Six-Shooters Net - Wednesday evenings at 8:00 PM six meters FM on 52.525 MHz (vertically polarized). David Jordan/KI4AWZnet control; and, Daily Six-Meter FM Ragchew net 7:00-9:00 PM on 52.525MHz (vertically polarized). James Peel/KG4VAR net control.

KY-QRP - Temporarily canceled.

Scott County Amateur Radio and Emergency Service Club (SCARES) - Meetings are the third Saturday each month, 9:00 AM in the Solarium room at Georgetown Community Hospital, 1140 Lexington Road, Georgetown. Check in to their weekly simplex net Tuesdays at 7:00 PM on 146.685 (PL 141.3).

Central Kentucky ARS (Richmond-Berea) - Meet the Third Thursday each month in the Madison County EOC, Richmond, Kentucky, at 7:00 PM. Talk-in on 146.865 (-600, PL-192.8 Hz) and 145.370 (-600, PL-192.8 Hz) repeater for location, directions to meeting site, or other information.

Greater Mason County ARA meeting, 7:00 PM, second Tuesday each month, Maysville Community College Science Building.

Pioneer ARC (Winchester) - Fourth Tuesday each month, Golden Corral Restaurant, 7:00 PM (eat at 6:00), except March 26 meet at Christview Christian Church (SkyWarn). Talk-in/info on 145.430 (-600 ,T-203.5).

Jessamine Amateur Wireless Society (Nicholasville) - Meet Second Monday each month, 7:00 PM, St. Joseph/R.J. Corman Ambulatory Care Center, 1250 Keene Road (U.S. 27 Bypass south to intersection with 169; turn at the light.) Talk-in on the 145.490 (T-123.0).

The Jessamine County ARES Net - Tuesdays at 7:30 PM, 145.490 Repeater, Gary Britten W4GNB net control..

The Madison County ARES Net, Monday at: 7:00 PM, 146.865 (pl 192.8). Everyone is invited to check in. . . Wilderness Trail Emergency Net, Wednesdays, 8:30 PM, 146.715 (pl 100.0). . .Glenn/KO4OL.

District 11 Skywarn Net meets Sundays at 8:00 PM on 146.925 (-PL- 79.7) and is linked to 147.180 (PL-74.4) and other repeaters in and close to the area. District 11 ARES Net meets Mondays at 9:00 PM on 146.925 (PL-79.7) and is linked to 147.180 (PL-74.4) and other repeaters in and close to the area.

Please send any changes or corrections to these notices to my attention, Bart Breeding/KB4FEE, in care of Bluegrass ARS, Inc., PO Box 4411, Lexington, KY 40544-4411, or e-mail to aratat291@twc.com.

Schedule for Volunteer Examinations in 2019-20

Harry Spark/KN4S,*
Bluegrass Volunteer Examiners
kn4s@kn4s.com

The exam schedule for 2019 follows nearly the same format as past years. The scheduling is for Lexington/Fayette County and the sessions in Danville, Georgetown, Winchester, and Richmond hamfest. The Bluegrass Amateur Radio Society-sponsored ARRL exams will continue to be held on the second Saturday of the second month of each quarter (except the August Session will be the date of the Central Kentucky ARRL Hamfest in Lexington), and the WCARS sessions remain as they were last year, Tuesday evenings quarterly.

Test Session Locations

Lexington*	Winchester**	Danville	Georgetown
Red Cross Building	Clark County EOC	Amer Legion Post 46	Georgetown Police Dept
1450 Newtown Pike	200 Maryland Ave	45 Spears Lane	550 Bourbon Street
Lexington KY 40509	Winchester KY 40391	Danville KY 40422	Georgetown KY 40324

* August, Bluegrass ARS Hamfest, Eastland Shopping Center, Lexington, Kentucky
** September, Richmond Hamfest, Madison County Fairgrounds, Richmond, Kentucky

Contact Information

ARRL VEC: Lexington and BARS ARRL Hamfest test sessions - Liaison Fernie Williams/KE4MAI, ke4mai@arrl.net, 859-652-3393 (www.bluegrassars.org)
Danville - Liaison John Wulf/K4FT, johnk4ft@gmail.com, 563-505-0339, Wilderness Road ARC, http://www.wrarc.com
Georgetown - Liaison Ron Malinowski/WX4GPS, wx4gps@arrl.net, 502-542-8252
WCARS VEC: Lexington - Liaison Marguerite Williams/KE4MAJ, ke4maj@arrl.net, 859-489-6274 (www.bluegrassars.org)
W5YI VEC: Winchester - Liaison Darrell Epperson/AC4YD, AC4YD@arrl.net, 859-771-1834

TEST SESSION FEE: ARRL - $15; WCARS - $10; W5YI - $14

Date and Time	VEC	Location
Dec. 10, 2019 7:00 pm	Margie Williams/WCARS	Red Cross Bldg. , Newtown Pike, Lexington, KY
Dec. 14. 2019 10:00 am	Ron Malinowski/ARRL	Georgetown Police Dept., Georgetown, KY
Jan. 11, 2020, 10:00 am	Darrell Epperson/W5YI	Clark County EOC, Winchester, KY
Jan. 25, 2020 10:00 am	John Wulf/K4FT	AM. Legion Post 45, Danville, KY
Jan, 28, 2020 6:00 pm	Brian Carter/KI4TLW	Anderson Co. Health Dept., Lawrenceburg, KY

Please find below the link to the Club's Ebay Account. Copy it into your browser and check out the items the club has up for auction.
https://www.ebay.com/sch/bluegrassars/m.html

Honor to the soldier and sailor everywhere, who bravely bears his country's cause. Honor, also, to the citizen who cares for his brother in the field and serves, as he best can, the same cause.

Abraham Lincoln

QUA/HAMnews is published monthly by the Newsletter Committee of the Bluegrass Amateur Radio Society, Inc., and is distributed by e-mail only.
Letters to the editor, technical articles, items of interest to the Ham community and guest editorials are invited and will be published at the discretion of the editor. Items for sale by members of the Society will be advertised without charge for one issue, and may be resubmitted as often as desired. These ads must be non-commercial in nature.
Articles published in QUA/HAMnews do not necessarily represent the views of the Officers, Board of Directors, editor, or Society membership, nor does publication thereof represent concurrence by the Officers, Board of Directors, editor, or Society membership of the contents of the article. No article will be published unless it is accompanied by the name(s) of the person(s) submitting the material.
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Annual Dues (January 1 - December 31)
Payable using Pay Pal - Go to <http://www.BluegrassARS.org>, Click on "Membership," click on the option for your preference as below:
Regular Membership: One year - $20.00; two years - $38.00; three years - $55.00 (Additional family member(s) at the same address $1.00 each per year)
Associate Membership - $15.00 (for those who reside farther than 50 miles from Lexington)
Full-Time Student Membership - $12.00 (for those 21 and under, and no other Club member in the family)
Shack telephone: (859) 231-0974 web page: http:/www.BluegrassARS.org/

Calendar of Ham Radio Activities for December 2019

Sun 1 Amateur Television & Specialized Communications Net, 9:00 PM (146.760 Repeater); London Regional Skywarn Net, 8:00 PM, 147.180 (PL-74.4 Hz) linked to 147.180 (PL-74.4 Hz), other repeaters in the area.

Mon 2 BARS General Membership meeting 7:30 pm; District 9 ARES Net 9:00 PM 146.925 (PL-79.7) linked to 147.180 (PL-74.4) and other repeaters in the area.; By-Laws Committee meeting 6:00 pm

Tue 3 Amateur Swap Net 145.370 (T-192.8) 8:00 PM; Fayette County ARES Net 8:30 pm It is on the LEX 94 machine ,146.940 MHZ, A NEGATIVE OFFSET, AND A PL TONE OF 88.5. , "Casual Communicators Net," 9:00 PM Eastern, 443.325+ MHz;

Wed 4 Wilderness Trail Emer Net, 8:30 pm, freq. 146.715, PL 100 ; Six Shooters Net, 9:00 PM on 52.525 MHz FM (vertically polarized);

Thu 5 Meeting of Bluegrass ARS Technical Group, 6:30 PM, Education Ctr, basement, Red Cross Building, 1450 Newtown Pike, Lexington; District 9 ARES Net 7:15 PM 147.180 (PL-74.4) and other repeaters in the area.
Jessamine Cty ARES Net, 7:30 PM, 145.490 Repeater, Gary Britten W4GNB net control. PARC (Clark Co.) 8:45 pm 145.43, P/L 203.5

Sat 7 Shack open 9:00-Noon; Radio Theory and Construction Workshop, 1:00-3:00 PM,

Sun 8 Amateur Television & Specialized Communications Net, 9:00 PM (146.760 Repeater); London Regional Skywarn Net, 8:00 PM, 147.180, PL-74.4 Hz) and other repeaters in the area

Mon 9 District 9 ARES Net 9:00 PM 146.925 (PL-79.7) linked to 147.180 (PL-74.4) and other repeaters in the area. Jessamine Amateur Wireless Society meeting, 7;00 PM, St. Joseph/R.J. Corman

Tue 10 Amateur Swap Net 145.370 (T-192.8) 8:00 PM; Fayette County ARES Net 8:30 pm It is on the LEX 94 machine ,146.940 MHZ, A NEGATIVE OFFSET, AND A PL TONE OF 88.5. , "Casual Communicators Net," PM Eastern, 443.325+ MHz;

Wed 11 Wilderness Trail Emer Net, 8:30 pm, freq. 146.715, PL 100 ; Six Shooters Net, 9:00 PM on 52.525 MHz FM (vertically polarized);

Thu 12 Meeting of Bluegrass ARS Technical Group, 6:30 PM, Education Ctr, basement, Red Cross Building, 1450 Newtown Pike, Lexington; District 9 ARES Net 7:15 PM 147.180 (PL-74.4) and other repeaters in the area.
Jessamine Cty ARES Net, 7:30 PM, 145.490 Repeater, Gary Britten W4GNB net control. PARC (Clark Co.) 8:45 pm 145.43, P/L 203.5

SAT 14 Shack open 9:00-Noon; Radio Theory and Construction Workshop, 1:00-3:00 PM,

SUN 15 Amateur Television & Specialized Communications Net, 9:00 PM (146.760 Repeater); London Regional Skywarn Net, 8:00 PM, 147.180 (PL-74.4 Hz) and other repeaters in the area.

Mon 16 Bylaws Committee Meeting, 6:00 pm ;Jessamine Amateur Wireless Society meeting, 7;00 PM, St. Joseph/R.J. Corman Ambulatory Care Center, 1250 Keene Road,, Nicholasville; ; Director's meeting 7:30 pm;

Tue 17 Amateur Swap Net 145.370 (T-192.8) 8:00 PM; Fayette County ARES Net 8:30 pm It is on the LEX 94 machine ,146.940 MHZ, A NEGATIVE OFFSET, AND A PL TONE OF 88.5. ,"Casual Communicators Net," 9:00 PM Eastern, 443.325+ MHz;

Wed 18 Wilderness Trail Emer Net, 8:30 pm, freq. 146.715, PL 100 ; Six Shooters Net, 9:00 PM on 52.525 MHz FM (verticallypolarized);.

Thu 19 Meeting of Bluegrass ARS Technical Group, 6:30 PM, Education Ctr, basement, Red Cross Building, 1450 Newtown Pike, Lexington; District 9 ARES Net 7:15 PM 147.180 (PL-74.4) and other repeaters in the area.
Jessamine Cty ARES Net, 7:30 PM, 145.490 Repeater, Gary Britten W4GNB net control. PARC (Clark Co.) 8:45 pm 145.43, P/L 203.5

Sat 21 Shack open 9:00-Noon; Radio Theory & Construction Workshop, 1:00-3:00 PM, basement, Red Cross Bldg, 1450 Newtown Pike;

Sun 22 Amateur Television & Specialized Communications Net, 9:00 PM (146.760 Repeater); London Regional Skywarn Net, 8:00 PM, 147.180 (PL-74.4 Hz) and other repeaters in the area.

Mon 23 District 9 ARES Net 9:00 PM 146.925 (PL-79.7) linked to 147.180 (PL-74.4) and other repeaters in the area.

Tues 24 Amateur Swap Net 145.370 (T-192.8) 8:00 PM; Fayette County ARES Net 8:30 pm It is on the LEX 94 machine ,146.940 MHZ, A NEGATIVE OFFSET, AND A PL TONE OF 88.5. , "Casual Communicators Net," 9:00 PM Eastern, 443.325+ MHz

Wed 25 "MERRY CHRISTMAS',, Wilderness Trail Emer Net, 8:30 pm, freq. 146.715, PL 100 ; Six Shooters Net, 9:00 PM on 52.525 MHz FM (vertically polarized);

Thur 26 Meeting of Bluegrass ARS Technical Group, 6:30 PM, Education Ctr, basement, Red Cross Building, 1450 Newtown Pike, Lexington; District 9 ARES Net 7:15 PM 147.180 (PL-74.4) and other repeaters in the area.
Jessamine Cty ARES Net, 7:30 PM, 145.490 Repeater, Gary Britten W4GNB net control. PARC (Clark Co.) 8:45 pm 145.43, P/L 203.5

Sat 28 Shack open 9:00-Noon; Radio Theory and Construction Workshop, 1:00-3:00 PM,

Sun 29 Amateur Television & Specialized Communications Net, 9:00 PM (146.760 Repeater); London Regional Skywarn Net, 8:00 PM, 147.180 (PL-74.4 Hz) linked to 147.180 (PL-74.4 Hz), other repeaters in the area.

Mon 30 BARS General Membership meeting 7:30 pm District 9 ARES Net 9:00 PM 146.925 (PL-79.7) linked to 147.180 (PL-74.4) and other repeaters in the area.; By-Laws Committee meeting 6:00 pm

Tue 31 "Happy News Year's Eve" Amateur Swap Net 145.370 (T-192.8) 8:00 PM; Fayette County ARES Net 8:30 pm It is on the LEX 94 machine ,146.940 MHZ, A NEGATIVE OFFSET, AND A PL TONE OF 88.5. , "Casual Communicators Net," 9:00 PM Eastern, 443.325+ MH