

## **AARC Meeting Minutes of April 9, 2019**

Called to order at 7:00 pm by Bob Pattison, VP and acting President tonight. Ed Berkowitz was unable to attend tonight. Bob asked us to congratulate Joe W2PVY on his 90<sup>th</sup> birthday!

Introductions were done by meeting attendees. See attached list of attendees.

### **Presentation given by Jim Owens on HF Propagation.**

Some highlights:

Propagation is the amateur's friend. There are 3 types of waves: direct, ground and sky. Direct wave is line-of-sight. Ground wave follows earth's curvature for frequencies less than 2 Mhz. Sky wave reflects from the ionosphere.

Free electrons in ionosphere caused by ionization by sun's radiation, primarily UV and X-rays. These free electrons cause refraction of electromagnetic waves. The more free electrons per square meter, the more refraction.

Several layers occur in ionosphere:

D - absorption during day at lower frequencies

E – 100-150 km high, some refraction

F1 – 24 hours per day

F2 – Peaks at noon

Both F layers merge into one layer at night. May be F2 skip layer up to 1800 miles. No signal detected in skip zone.

E-sporadic 1200 miles 1<sup>st</sup> skip zone. Used for 6 meters.

We are in the low part of the current sunspot cycle.

Multiple wave-fronts are radiated by our antennas.

Several key definitions given:

1. Critical Frequency: Highest frequency reflected when transmitted signal is straight up at 90 degrees.
2. Maximum Useable frequency (MUF): Highest frequency that can be used to communicate between points A and B.  
Rule of thumb: MUF is 3 times the critical frequency for F-layer.  
MUF is 5 times the critical frequency for E-layer.

3. Lowest Usable Frequency (LUF): Lowest frequency that can be used to communicate between points A and B.
4. Optimum Working Frequency: 20% below MUF, best frequency for communications.

RF wave-fronts are linear and are either horizontally or vertically polarized. When waves reach ionosphere, they break into 2 circularly polarized waves. Right circular polarized is called "O" wave and Left Circular polarized wave is called extraordinary wave or "X". The 2 waves have slightly different propagation characteristics. X wave has critical frequency 600 Khz higher than O wave.

80/75 meter and 160 m bands most used for Near vertical incidence skywave (NVIS).

Described Wallops Island ionosphere sounder sends signal every 2 minutes to scan for critical frequencies. Uses radar reflections vertical to ionosphere. Displays charts based on this data called Dynasonde ionograms.

Discussed solar sunspot cycles. Last solar maximum occurred in 2012. Sunspot count now at zero or near it. Various indices used for solar weather including Solar Flux Index (SFI), Sunspot number, Solar wind, MUF, and foE and fof2.

Reference websites for more information:

[www.hfunderground.com/propagation](http://www.hfunderground.com/propagation)

[www.swpc.noaa.gov](http://www.swpc.noaa.gov)

[www.wm7d.net/hamradio/solar](http://www.wm7d.net/hamradio/solar)

[www.qrzcq.com/dxcluster](http://www.qrzcq.com/dxcluster) (worldwide dx clusters)

[www.hamqsl.com/solar.html](http://www.hamqsl.com/solar.html)

[www.surf.colorado.edu/login.doc](http://www.surf.colorado.edu/login.doc) source of ionograms.

Best guide on propagation: "Propagation and Radio Science" ARRL

## **Committee Reports:**

### **Field Day Bob Romanko:**

FD last full weekend of June.

Need to fill leadership areas.

- Educational activities: could do Boy Scout radio merit badge.
- Antenna team manages getting antennas erected at FD site.
- PC network and logging setup.

5 minute break taken.

March minutes approved.

### **Treasurer's Report by Don Eason:**

Beginning Balance:                 \$21069.26

Checks:                                 \$744.95

Credits:                                 \$361.06

Ending Balance:                     \$20,685.37

### **Public Service Report by John Porter:**

Jefferson Cup Bicycle race April 20 will be our first public service club event this year. Any members interested should contact John Porter. Will use 146.73 repeater.

### **Technical Committee Report by Bill Pond:**

New S-com repeater controller installed at Martha Jefferson and is working well. This is our only S-com so far and Bill recommends purchasing 3 more S-com's for our other repeater sites.

Several issues with Buck's Mtn 895 repeater. Noise issues, power supply died. New noise filters put in to correct noise problems. New county tower is moving forward, slowly. County requires certified and insured installers to put up AARC antenna on county tower. New S-Com controller/repeaters cost \$550 each. We should be able to sell old ARcom repeaters for \$300-400 each.

**Education Committee Report by Rick Oliver:**

Several meetings ago, Cole Fairchild of Buford Middle School gave a presentation about putting together a demo of STEM projects to interest middle school students, especially young women and minorities. It's now scheduled for 4/25 at Buford Middle School. If interested in helping out, contact Rick.

**Estate Sales Report by Jim Owen:**

Jim is still working on repairing several pieces of donated equipment that the club will then sell.

**Raffle report by AJ Miller.**

Raffle held and various items taken by winners. \$53 was raised for club.

Old Business: none

**New Business:**

Larry requested money for 2 pop-up tents for FD. Motion carried for \$200 towards purchase of these tents for FD.

John Porter said he would be removing people from club mailing list who have not paid 2019 dues. If anyone is incorrectly removed, contact John by email.

Larry asked people to circle names on attendance list if interested in helping with FD.

Meeting adjourned at 8:23 PM.

Respectfully submitted,

/s/ Stephen Kramer, Secretary

AARC Sign-In Sheet For

April 9, 2019

Guests Please Note: Please add your contact information on the back for additional information about the club and amateur radio.

NAME	CALL/Guest
1 STEPHEN KRAMER	KM4CJI
2 KEVIN C WALINA	KASHR
3 Bob ROMANKO	AK4BR
4 BILL OLEKSY	KF4IE
5 Tom Moore	WB5BNT
6 Jan Callahan	KN4TGG
7 Ben Casto	Nx55
8 GREG FAUST	N4PGS
9 Bill Pond	NØWP
10 Conroy Pond	α
11 George Krotz	AA4D
12 DAVID A THOMAS	WD3O
13 JIM OWEN	KYCGY
14 Dennis TERRIBILE	WR410
15 Larry Secker	K4JZQ
16 Max Crosby	K4JEC
17 Patsy Crosby	K4PMC
18 DON EASON, JR.	N4UVF
19 AS MILLER	KE4AJM
20 Joe DeVincentis	KØ9V
21 Diane Balister	KB4JNH
22 MIMI BALISTER	WB4ZJO
23 JIM CONDON	AD4YM
24 Michael Ellington	KN4BFB
25 Dar Shomarel	NØDJS
26 John Porter	KK4JP
27 RICK OLIVER	W3KDR
28 Russell Loumy	KN4LAU
29 Bob HATHISON	K4DU
30 JOE GIOVANELLI	W2PVY
31 DENNIS MENNERICH	K4THE
32 Eric Santana	KM4EVT
33 Dave Dawson	KM4YNY
34 Mike McPherson	KØ9P
35 WYMAN S. JORDAN	AT2MV
36 Dave Dawson	W4DND
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NAME	CALL/Guest
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