



**INDIAN
RIVER ARC**

P.O. BOX 237285, COCOA
FLORIDA 32923-7285

VOLUME XLII, NUMBER 2

SPURIOUS EMISSIONS

FEBRUARY, 2021

CLUB MINUTES

OFFICERS

PRESIDENT

VIRON PAYNE
N4VEP

VICE-PRESIDENT

DAVID LERRET
KUOR

SECRETARY

ERNIE HOFFMAN
K1CPO

TREASURER

STEVEN LUCHUK
N4UTQ

DIRECTOR

DAVID SLAWSON
K4UZM

NEWSLETTER EDITOR

ARMANDO DELGADO
KN4JN

The meeting was called to order by President Viron, N4VEP at 7:16 PM, followed by the Pledge of Allegiance.

Viron then called for approval of the minutes of the January, 2021 meeting. A motion was made, seconded and the minutes were unanimously approved.

Treasurer's Report: The club has \$1796.62 in the Equipment Fund and \$1537.39 in the General Fund.

Technical Committee Report: Dave, KUOR stated that all repeaters are functioning well. He also mentioned that the 220 MHz repeater has had very good reports.

The ECOM Ops Center at the River of Life Church is now in full operating capability and Dave is now setting a security video system. Dave is also working on getting keys to the Ops Center for some club members so that the station could be manned in an emergency.

With views to perhaps operating Field Day from the meeting room, Dave is planning a ground system to match anten-

nas to be placed in the church back field.

President's Report: Viron reminded the members of the ARES training net each Wednesday at 7:15 PM, also of the 10-week ARES training being given at the Mims Volunteer Fire Station every Saturday from 8 AM to 12 PM. He further mentioned that some members participated in the Winter Field Day operation at Manatee Park on January 30, 2021. Using the call sign AJ4IR, the club scored 4516 points, mostly from bonus points, since only two valid contacts were achieved. Viron hoped to use MS Team for the virtual club meetings, but due to lack of interest, he decided to continue with Zoom in spite of the 40 minutes time limit. New Business: Viron asked for a motion to have the Simplex Test on a monthly or bi-monthly basis. No motion was offered, so the Simplex Tests will continue on a random basis for the time being.

The Field of Dreams antenna farm is still a project. Viron priced numerous items for the

project: 500 feet of 5/16 Dacron rope, \$138.85 (plus shipping); a dozen of 5/16"x 3" 316-SS eyebolts for \$34.80 (plus tax); and a 30ft man-lift for \$384.17, for one-day rental; total estimate, \$557.82, plus tax and shipping. Viron then asked for a motion to approve up to \$500 for these purchases. The motion was made, seconded and passed.

The ARES MOU presented by the club was rejected by the ARES representative. This issued is tabled for now. Viron asked for DX radio contacts by members in the past week. No one offered any contacts, but Viron mentioned that during the Winter Field Day operation he contacted a station in Australia and another in the Canary Islands. Following the business meeting, Viron presented a YouTube video on the Space-X Raptor engine that can be viewed at <https://youtu.be/LbH1ZDlmal8>

Following the presentation, the meeting adjourned at 8:27PM.

Respectfully submitted for the Secretary by Armando Delgado, KN4JN

HAPPENINGS

YouTube recordings and PDF files from the [2021 Propagation Summit](#) hosted on January 23 by Contest University are available. Each presentation begins approximately on the hour. You can advance the video to the presentation you wish to view.

11 AM - "Update on the Personal Space Weather Station Project and HamSCI Activities for 2021" by Dr. Nathaniel Frissell, W2NAF

12 Noon - "Solar Cycle 25 Predictions and Progress" by Carl Luetzelschwab, K9LA

1 PM - "Maximizing Performance of HF Antennas with Irregular Terrain" by Jim Breakall, WA3FET

2 PM - "HF Propagation: What to Expect During the Rising Years of Solar Cycle 25," by Frank Donovan, W3LPL.

Slides decks are available for each presentation in PDF format: [Frissell](#); [Luetzelschwab](#); [Breakall](#), and [Donovan](#).

The WSJT Development Group has announced the general availability release of WSJT-X Version 2.3.0. A summary of new features can be found in the WSJT-X 2.3 [User Guide](#). The [Release Notes](#) offer additional

information, including a list of important program changes since the WSJT-X 2.2. Upgrading from earlier versions of WSJT-X should be seamless, and it's not necessary to uninstall a previous version or move any files. [Installation packages](#) for Windows, Linux, and Macintosh are available. A release candidate (i.e., beta version) WSJT-X version 2.4.0-rc will be available soon. Its

main new feature is a mode called Q65, with unique capabilities for EME and scatter propagation modes.

Interesting You Tube talk on Summits on the Air (SOTA) https://www.youtube.com/watch?v=Bi1_guZHJVI. There are not any qualifying summits in Florida, but still local hams can participate as "chasers".

HamSCI Workshop 2021 Save the dates! The next HamSCI workshop will be held virtually March 19-20, 2021. The HamSCI workshop is an annual meeting to share scientific and engineering ideas and results related to amateur radio, radio propagation, and radio science, as well as foster collaborations between the amateur radio and professional space science and space weather communities. The 2021 workshop will serve as both a team meeting for the Personal Space Weather Sta-

tion project, as well as a forum for presentations on topics relevant to the HamSCI mission. The theme of the **2021 HamSCI Workshop** is midlatitude ionospheric science.

A "Perfect Coronal Mass Ejection" Could Be a Nightmare. A [new study](#) in the research journal Space Weather considers what might happen if a worst-case coronal mass ejection (CME) hit Earth — a "perfect solar storm," if you will. In 2014, Bruce Tsurutani of Jet Propulsion Laboratory (JPL) and Gurbax Lakhina of the Indian Institute of Geomagnetism introduced the "perfect CME." It could create a magnetic storm with intensity up to the saturation limit, a value greater than the Carrington Event of 1859, the researchers said. Many other spaceweather effects

would not be limited by saturation effects, however. The interplanetary shock would arrive at Earth within about 12 hours, the shock impingement onto the magnetosphere would create a sudden impulse of around 234 nanoteslas (nT), and the magnetic pulse duration in the magnetosphere would be about 22 seconds. Orbiting satellites would be exposed to "extreme levels of flare and interplanetary CME (ICME) shock-accelerated particle radiation," they said. The event would follow an initial CME that would "clear the path in front of it, allowing the storm cloud to hit Earth with maximum force." More details [here](#).

The COVID-19 pandemic-modified [ARRL Field Day](#) rules from 2020 will continue this June with the addition of a power limit imposed on Class D

(Home Stations) and Class E (Home Stations-Emergency Power) participants. Field Day 2021 will take place June 26 – 27.

For Field Day 2021:

Class D stations may work *all other* Field Day stations, including other Class D stations, for points. This year, however, Class D and Class E stations will be limited to 150 W PEP output.

An *aggregate* club score will be published — just as it was done last year. The aggregate score will be a sum of all individual entries that attributed their score to that of a specific club.

The ARRL Field Day web page contains for complete rules and entry forms, as well as any updated information as it becomes available. Join the ARRL Field Day [Facebook page](#).

ON THE AIR

I ♥ Pluto Special Event Feb 13-Feb 21, 0000Z-2359Z, W7P, Flagstaff, AZ. Northern Arizona DX Association. 14.290 21.290 7.290 14.090. Certificate & QSL. W7P - I ♥ Pluto Special Event, % Bob Wertz, NF7E, 6315 Townsend Winona Rd., Flagstaff, AZ 86004-1493. This will be an annual countdown S. E. to the 100th anniversary of the discovery of PLUTO, held every February, up to and including 2030. We are celebrating this historic discovery of Pluto, in 1930, by Clyde Tombaugh, at Lowell Observatory in Flagstaff, Arizona. Please note the frequencies will be + or - 10, as to not interfere with any nets operating during that time period. www.nadxa.com

International DX Contest –CW portion, February 20-21. Begins 0000 UTC Saturday and runs through 2359 UTC Sunday.

International DX Contest –phone portion, March 6-7. Contest Period: Begins 0000 UTC Saturday and runs through 2359 UTC Sunday.

Arrows from the Air Mar 20-Mar 21, 1800Z-0300Z, K7SWI, Middleton, ID. South West Idaho Amateur Radio Club. 28.427 14.227 7.227 3.827. Certificate & QSL. South West Idaho Amateur Radio Club, 332 West Dewey Ave, Nampa, ID 83686. What Are Those Giant Arrows dotting the American landscape? The arrows were part of a federal project to speed up communication across great distances. The government built a path of 70-foot-long concrete arrows every few miles from coast to coast, each painted yellow and topped with a 51-foot steel tower that had a rotating beacon. K7SWI will issue a Certificate and QSL to all requested please include SASE for QSL only

and SASE with one green stamp for QSL and Certificate.

8J1RL will be active from **Showa Research Station, Queen Maud Land**, IOTA AN - 015, February 2021 - January 2022. Operator - Takumi, JG3PLH will operate on HF Bands, CW, Digital Modes. QSL via JG2MLI. Direct QSL: Yath Yoshikawa, Johoku 1-63-2, Nishi, Nagoya-city Aichi-pref. 451-0023, Japan. DXCC Country - Antarctica. CQ WAZ Zone - CQ 39.

To celebrate **Peru's** 200 years as a republic, the Peruvian Radio Club will field some special call signs throughout 2021. Listen for OC200P, OC200E, OC200R, and OC200U. The single-letter suffixes spell "PERU." Only one of the commemorative call signs will be on the air at a time – OC200P in January, May, and September; OC200E in Febru-

ary, June, and October; OC200R in March, July, and November, and OC200U in April, August, and December. QSL to OA40.

ANTARCTICA. Ramon, LU3HRS is QRV as LU1ZG from Base Belgrano II while on work assignment. He is usually active on 20 meters using FT8 between 1900 and 2300z. QSL via LU4DXU.

BULGARIA, LZ. Special event station LZ190FT is QRV during all of 2021 to commemorate the 190th birthday of Bulgarian revolutionary Filip Totyu. QSL via LZ2VP.

UKRAINE, UR. Special event stations EM150PLU, EN150PLU and EO150PLU are QRV during all of 2021 to celebrate the 150th birthday of the poet Lesya Ukrainka. QSL via operators' instructions.

Making Better Batteries by Armando Delgado, KN4JN

Batteries are an essential component of modern life. Just about every device, tool, equipment, or vehicle imaginable can be and is powered by batteries. With all those different uses, there are very different types of batteries; yet regardless of the type, all batteries work on the same principle, a quirk of nature that determines that when two dissimilar elements come in contact with each other there is a transfer of electrons. This transfer of electrons produces a current, and the potential difference between the elements causes a voltage. This phenomenon is called the electrochemical potential.

To make batteries practicable and functional, the elements do not touch each other but are separated by an electrolyte solution that allows electrons to flow. In a battery, the element donating electrons is called the cathode and the one receiving electrons the anode.

In the oldest type of dry cell batteries, the zinc-carbon batteries, the cathode is zinc, the anode a carbon rod and the electrolyte ammonium chloride (NH_4Cl). With use, this type of battery, called primary battery, loses its charge fairly quickly. This happens due to a process called *polarization* in which hydrogen ions build up around the anode and block the flow of electrons. This blockage raises the internal resistance of the battery and causes the voltage to drop. In this type of battery, the process is irreversible. Ironically, the potential difference between the cathode and anode is intact, but the battery is useless.

Upon recognition of this polarization phenomenon, manufacturers addressed the problem by efforts to diminish the amount of hydrogen ions in the battery. Initial efforts to counteract polarization, utilized a layer of manganese dioxide (MnO_2) around the anode. This substance reacts with the freed hydrogen ions to form water, thus

slowing the polarization process. Later the alkaline battery that uses potassium hydroxide (KOH) for the electrolyte was developed. Compared to NH_4Cl , KOH carries a lot less hydrogen in its molecule. Thus, alkaline batteries have a longer shelf life than the older batteries. Unfortunately, KOH requires an aqueous medium (H_2O) that in time breaks down releasing hydrogen ions.

The next effort to counteract polarization led to the development of the *rechargeable* battery. By careful selection of the elements for anode and cathode, it is possible to reverse the polarization changes by applying a reverse current to the battery. This current flows from the anode to the cathode and through electrolysis dislodges the accumulated hydrogen ions from the anode, restoring the battery to its initial balance. The process is called *recharging* but this is a misnomer since all the process does is release the initial potential between the anode and cathode, which had not been depleted, just blocked. After many cycles of charging and recharging, the electrolyte in this type of battery breaks down and the battery will not hold a charge any longer.

The most current effort against polarization involves what are called *graphene* batteries. In this battery remedy, the anode of the battery is covered by an atom-thin layer of carbon atoms that form a mesh that allows electrons to pass through but prevents hydrogen ions from attaching to the anode. So far, the main use of this technique is on lithium batteries employed in electric automobiles. Electric car batteries drain quite rapidly, lasting on average 3-4 hours, and require recharging that takes time. The graphene batteries

will extend not only the time between charges but the life of the battery as well. These electric car batteries are very expensive, so extending their life would mean a great saving to the consumer.

We have seen over the past 30 years an extensive research effort to improve the electrochemical batteries. Yet, for the last century we have known the existence of a type of battery that has a very long life and does not need recharging, but research and commercial production of these batteries remains very limited. Those are the atomic batteries, but that is a topic for another discussion.



W1AW CW PRACTICE TRANSMISSIONS

7 PM EST Slow CW : 5-15 WPM
Mon, Wed, Fri

7 PM EST Fast CW: 35-10 WPM
Tue, Thu

FREQUENCIES:

1.8025, 3.5815, 7.0475,
14.0475, 18.0975, 21.0675,
28.0675, 50.350, 147.555



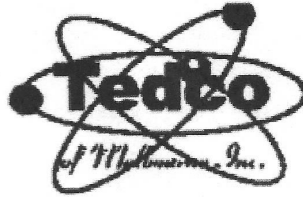
Editor's Note:

Send comments about the Newsletter or to contribute information or articles to the Editor's email address:

olardeiga@aol.com.

ACTIVE REPEATERS INCLUDING DMR, PACKET & SIMPLEX							RACESBRE0008 REV B
Repeaters & Packet are open for all licensed amateur radio operators to use.							
OUTPUT FREQ.	STD. NAME	OFFSET	TONE/CC	CALL	LOCATION	OWNER	NOTES
WBFM							
145.130	130 VB	-600	107.2	AB4AZ	VERO BEACH, INDIAN RIVER	AB4AZ	
145.350	350 SC	-600	103.5	K4OSC	St. CLOUD, OSCEOLA	K1XC	Radio Science Club, FI Club
145.370	370 CO	-600	156.7	W2SDB	COCOA-BROADCAST CT.	IRARC	Yaesu Repeater replaced with Bridgecom FM
145.470	470 ME	-600	107.2	K4HRS	MELBOURNE- RIALTO PL.	HIRAC	
145.490	490 TI	-600	100.0	WN3DHI	TITUSVILLE SR405 & Fox 1k rd.	WN3DHI	
146.610	610 ME	-600	None/107.2	W4MLB	MELBOURNE- HOLMES HOSP	PCARS	Tone Downlink only
146.625	625 MM	-600	100.0	KE4NUZ	NW of MIMS NEAR HARRISON RD.	KE4NUZ	Limited coverage
146.775	775 MM	-600	100.0	K4KSC	NW of MIMS Hog Valley , W of I95	K4KSC	
146.850	850 ME	-600	None/107.2	W4MLB	PALM BAY- Port Malabar Rd.	PCARS	Tone Downlink Only
146.880	880 RO	-600	107.2	W4NLS	ROCKLEDGE- WUESTHOFF HOSP.	IRARC	FUSION Repeater replaced with Bridgecom F
146.895	895 PB	-600	107.2/107.2	K4EOC	PALM BAY- DeGroot Library	EOC	TSQL as of 5/2018
146.910	910 TI	-600	107.2	K4KSC	TITUSVILLE Water Tower on south st.	TARC	
146.940	940 RO	-600	None	K4GCC	ROCKLEDGE Carver Rd.WLRQ Tower	LISATS	
146.970	970 TI	-600	107.2	K4KSC	TITUSVILLE-T'VILLE TOWERS	TARC	
147.075	075 SC	+600	107.2/107.2	K4EOC	SCOTSMOOR Near US1-Aurantia Rd	EOC	TSQL as of 5/2018 Relocated 4/2019
147.135	135 RO	+600	107.2/107.2	K4EOC	ROCKLEDGE-EOC	EOC	TSql as of 5/2018
147.240	240 DE	+600	123.0	KV4EOC	DELAND	VARES	
147.255	255 PB	+600	107.2	K4DCS	Near Babcock & Palm City S City limi	PBARC	
147.330	330 TI	+600	107.2	K4NBR	TITUSVILLE-PARRISH HOSP.	NBARC	
147.360	360 TI	+600	107.2	N4TDX	TITUSVILLE-PARRISH HOSP.	NBARC	DSTAR Gateway in work
442.850	850TI4	+5000	107.2/107.2	N4TDX	TITUSVILLE-PARRISH HOSP.	NBARC	TSql;FUSION/WBFM/WIRES-X
444.325	325ME4	+5000	107.2	K4DCS	MELBOURNE-TRINITY TWRS-E	PBARC	
444.375	CNLBRE	+5000	107.2		195 FDT Twr 1/2 Mile N of County Lin	SARNET	"SARNet Sebastian Repeater"
444.425	425ME4	+5000	107.2	W4MLB	MELBOURNE- RIALTO PL.	PCARS	
444.525	525RO4	+5000	103.5/103.5	K4EOC	ROCKLEDGE-EOC	EOC	TSql; VOICE/NBEMS
444.650	CNMBRE	+5000	107.2	W4NLS	COCOA-FHP SR520	IRARC	"SARNet Cocoa Repeater"
444.750	750TI4	+5000	156.7/156.7	N4TDX	TITUSVILLE- TGO WATERTOER 230 ft.	NBARC	TSql
444.875	875MI4	+5000	107.2	KC2UFO	MERRITT IS. COURTNEY SPRS.	K4UJZM	
444.925	925KS4	+5000	131.8/131.8	N1KSC	KENNEDY SP. CTR.-VAB	KSCARC	FM Tsql ; P25 capable
224.120	120CO2	-1600	123.0	AA4CD	COCOA Broadcast Ct.	AA4CD	
DMR							
444.150	150TI4	+5000	CC1	K2JO	TITUSVILLE-PARRISH HOSP.	KC2CWT	DMR FL
444.575	575CO4	+5000	CC3	K4DJN	COCOA BROADCAST CT.	AA4CD	DMR Brandmeister
444.675	675TI4	+5000	CC3	K4DJN	TITUSVILLE-T'VILLE TOWERS	AA4CD	DMR Brandmeister
ATV							
427.250	250CO4			K4ATV	COCOA BROADCAST CT.	LISATS	NTSC INPUT 439.25 See www.lisats.org
PACKET STATIONS:							
145.090	W12KPB	WINLINK		W2PH-10	PALM BAY-W2PH QTH	PBARC	WINLINK GATEWAY
145.090	090 ME	PCARS		W4MLB-2	MELBOURNE-TRINITY TWRS-EAST	PCARS-K1YON	BBS W4MLB-4 EASTNET
145.770	770 PB	SEDAN		K4EOC-7	PALM BAY	N2DB	http://www.fla-sedan.com
145.770	770 TI	SEDAN		KD4MWO-4	TITUSVILLE	N2DB	INACTIVE NODE
BREVARD RACES/ARES SIMPLEX							
146.480	CENTX	SIMPLEX		N/A	CENTRAL REG	IRARC	CENTRAL NET SIMPLEX BACKUP
146.550	SOUTHX	SIMPLEX		N/A	SOUTH REGION	PBARC	SOUTH NET SIMPLEX BACKUP
146.580	MLBX	SIMPLEX		N/A	MELBOURNE REGION	PCARS	MELBOURNE REGION NET SIMPLEX BACKUP
146.595	NORTHX	SIMPLEX		N/A	NORTH REGION	TARC	NORTH NET SIMPLEX BACKUP
147.540	EOCROX	SIMPLEX		N/A	RACES Bay	EOC	EOC VOICE/NBEMS
SIMPLEX							
146.520	CALL52	SIMPLEX		N/A	Station to station, anywhere		VHF national simplex calling freq
146.490	TAC A	SIMPLEX		N/A	Station to station, anywhere		Standardized tactical option since 2006
146.560	NBRX	SIMPLEX		N/A	NBARC -Club/Parrish Hosptial Activities		
146.580	TAC B	SIMPLEX		N/A	Station to station, anywhere		Standardized tactical option since 2006
147.420	TAC C	SIMPLEX		N/A	Station to station, anywhere		Standardized tactical option since 2006
147.420	IRARCX	SIMPLEX		N/A	IRARC "FUN NET" and CLUB ACTIVIES		
147.450	TAC D	SIMPLEX		N/A	Station to station, anywhere		Standardized tactical option since 2006
147.570	TAC E	SIMPLEX		N/A	Station to station, anywhere		Standardized tactical option since 2006
446.000	CALL46	SIMPLEX		N/A	Station to station, anywhere		UHF national simplex calling freq
446.500	TAC A4	SIMPLEX		N/A	Station to station, anywhere		Standardized tactical option since 2006
446.600	TAC B4	SIMPLEX		N/A	Station to station, anywhere		Standardized tactical option since 2006
446.700	TAC C4	SIMPLEX		N/A	Station to station, anywhere		Standardized tactical option since 2006
2 Meter & 70 cm WBFM repeaters use CTCSS; if one frequency is listed it is for uplink (user Tx) , if two are listed the repeater is set for uplink and downlink (user Tx and user Rx)							
Repeater Call Signs in bold are owned by Brevard Emergency Management and are maintained by the county. Repeater Trustee: Ron K2RJ							
NOT ON AIR							
Standard Names in Bold are recommended for Emergency Radio in Brevard *							
PBARC= Palm Bay Amateur Radio Club (Replaces DCS for South Brevard) See Ed W2PH for more info							

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HARADA
HITACHI
HYGAIN

ICOM RADIO

JSC WIRE
JW DAVIS SOUND
JVC PARTS

KENWOOD RADIO
KOSS
KESTER

LITTELFUSE
LOWELL

M & G
MALLORY
MACOM
MAXON
MIDLAND
MOTOROLA

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NELLO TOWERS
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