

The Printed Circuit

The Monthly Publication of the
Tallahassee Amateur Radio Society
January, 2020



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MINUTES OF THE JANUARY 9, 2020 TARS MEETING

Compiled and Submitted by: Tom Brooks (K4TB) – TARS Secretary
Call to Order: President Don Pace (KK4SIH) at 7:00 PM
Guests/Visitors: Janet Marshall and David Eddy (no callsigns)

Program: CPT Taylor Wagner, a U. S. Army Engineer in the Florida National Guard, presented an overview of radio communications used by the Guard. CPT Wagner serves as a unit signal officer and has an Electrical Engineering degree. He reviewed the different kinds of radios and systems utilized by the Guard which include HF, VHF and UHF tactical radios, and terminal equipment for various satellite systems.

Business Committees:

Minutes: Secretary Tom Brooks (K4TB): Approved as published in the November 2019 Printed Circuit on the website.

Treasury Report: Treasurer Doug Ferrell (KD4MOJ) and outgoing treasurer Gerry Gross (WA6POZ): Accepted as reported in the November 2019 Printed Circuit.

Current balances are: Checking \$2,688.20, Savings \$3,101.13, Total \$5,789.33.

Education and Testing: Testing Coordinator Norm Scholer (K4GFD) said recent testing had 6 people taking tests, with 5 passing. Norm said the next testing

session will be the first Tuesday in February (Feb. 4th).

Repeaters: Repeater Coordinator Randy Pierce (AG4UU), said there were no issues with the .91 or .03 repeaters, or with SARNET. He said the 6-meter repeater is down however, pending relocation to a new site as the old tower site is being closed down. Randy said he is currently attempting to find a new home for the 6-meter repeater. Current plans in the interim are to store the repeater at a hangar at the airport.

Old Business:

Cub Scout Family Weekend at Wallwood Boy Scout Reservation: Tom reported that the event was moved from October to November (16th) due to a storm but there was a good turnout and he believes we made a good impression based on the responses from the visitors and the staff. He thanked the hams that helped. He said we operated a 20-meter station and a Morse Code learning exhibit. He estimated that between 50-70 people visited our setup. His only regret is that, due to the postponement, the event couldn't be on the same day as the national Jamboree on the Air.

Tallahassee Marathon: Vice-President Todd Clark (KN4FCC) said it would be the same route as last year and happen from 7am-2pm on Sunday, February 2nd. He asked volunteers to sign up.

Mag Lab: Member-at-Large Phil (Chief) Fusilier (KA4USN) said Open House is Saturday, Feb, 22nd. He needs volunteers.

Havana Hills Bike Ride: Will be Sunday, Feb, 23rd. Todd said we need an organizer for that event.

Field Day: Jerry Kessler (N4JL) said the CW station would be operated and suggested the CW team could help with a phone station. Randy said he possibly can provide an RV for the phone station. Chief said the request to use Tom Brown Park was submitted. Don said he would do the digital station if he has help. Tom said he could set up a satellites station.

Tars and Feathers Award: Don announced that the 2019 winner of the award was Todd. Applause followed.

New Business:

PIO: Don asked for a volunteer to be the Public Information Officer.

Future Programs: Don asked for help with new ideas for programs for club meetings.

Antique Radio Donation: Stan (K4SBZ) said the TARS mailbox received an email from a person who wants to donate a Westinghouse Aeriola Senior Receiver.

Theo Titus (K4MVL) made a motion for the club to accept the donation on the condition that the club donate it to a museum to be selected by the club. Chief seconded. The motion passed.

Art Marshall, W1FJI (SK), Stuff for Sale: Steve Welsh (AD4E) described items on hand at the meeting for sale from Art Marshall's estate. Janet Marshall said that there is much more of Art's radio stuff on hand with her and to contact her at 590-5823 or janrm@comcast.net if interested.

Open Discussion/Announcements: None

Adjournment – The meeting was adjourned at 8:26 pm.

TARS Treasurer's Report

Submitted by Doug Ferrell, KD4MOJ, Treasurer

	for period	year-to-date
<u>Beginning Balances:</u>	1-Jan-20	Jan 1, 2020
Cash on hand - \$ - \$		
Checking Account:	2,688.20	\$ 2,688.20 \$
Savings Account:	3,101.52	\$ 3,101.52 \$
Total:	5,789.72	\$ 5,789.72 \$

Summary of Month's Activity:

Total Receipts:	1,014.00	\$ 1,014.00 \$
Total Expenditures:	154.00	\$ 154.00 \$

Receipts Derived From:

Members Dues:	400.00	\$ 400.00 \$
Fifty/Fifty	14.00	\$ 14.00 \$
Donation	600.00	\$ 600.00 \$
Veteran's Radio Fund	\$	\$
Field Day Radio Fund	\$	\$
Interest (Savings)	\$	\$
Total	1,014.00	\$ 1,014.00 \$

Expenditures:

American Red Cross:	\$	\$
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Fifty-Fifty	\$	\$
ARRL Insurance	\$	\$
Spagetti 100 - TARC	\$	\$
TARS & Feathers Plaque	\$	\$
Storage & Supplies	\$	\$
Field Day	\$	\$
VE Expenses	\$	\$
Tower Maintenance	\$	\$
Florida Dept of State	\$	\$
Post Office Box:	154.00	\$ 154.00 \$
Total:	154.00	\$ 154.00 \$
Transfer Checking -> Savings:		

Ending Balances - Jan 24, 2020:

Cash on hand	\$	\$
Checking Account	3,548.20	\$ 3,548.20 \$
Savings Account	3,101.52	\$ 3,101.52 \$
Total	6,649.72	\$ 6,649.72 \$

*Veteran's Radio Fund 500.00 \$

*Field Day Radio Fund 697.00

Contesting

February RadioSport Highlights

February is a busy month for contesting with big activity every weekend. There are five major contests sponsored by the ARRL, CQ Magazine or NAQP and another six smaller DX contests scheduled. February also marks the opening of the State QSO Party season. [WA7BNM Contest Calendar](#) lists 30 sponsored activities for January worldwide, so there are more than enough contests scheduled to keep you busy depending on your interest – phone, CW or digital.

Preview of February Weekends

February 1-2

The first weekend of the month is a big weekend for **State QSO Parties**. The SQP season is launched with QSO Parties from **Vermont, Minnesota** and the Canadian Province of **British Columbia**. Spread from East Coast to West Coast, these three SQPs will challenge your grasp of **propagation**. **Please be aware that only in-state operators need give their counties. You should** give just the RS(T) and your state. *(Also, be sure to note the announcement about State QSO Parties below.)*

The **Black Sea Cup International** is a contest for both CW and SSB. The exchange is RST, ITU Zone, and a serial number. Multipliers are ITU-zone, HQ-stations, Black Sea countries and Black Sea Contest Club members.

For RTTY operators we have the **Mexico RTTY International Contest**. This contest has become popular with US operators. Multipliers are the Mexican states and DXCC countries. The exchange is RST and serial number.

Sprints add a whole new dimension for contesters. We are accustomed to finding a good frequency and holding on to it while we “run.” Sprints have a QSY rule that allows you to hold the frequency for just one series of contacts before you have to QSY. The **North American CW Sprint** running for just four hours Sunday evening will be a real test of your operating skills.

February 8-9

The highlight of this weekend is the **CQ Worldwide RTTY WPX Contest**. Because working as many callsign prefixes as possible is the objective of this contest, many operators’ strategy is to operate S&P (Search and Pounce) with a liberal use of DX clusters to find a variety of prefixes. The exchange for everyone is RST and serial number. Club competition is included in this contest, so be sure to include our group in the Cabrillo log.

The other modes, SSB and CW, have the Dutch PSCC Contest this weekend. Multipliers are Dutch provinces per band per mode. The exchange for non-Dutch stations is the usual RST and serial number. We had one member operate in this contest last year. Let's multiply that.

February 15-16

The **ARRL International DX Contest, CW** takes over this weekend. Scoring for W/VE stations is the number of contacts multiplied by the sum of DXCC entities (except US and Canada) worked per band. The familiar exchange is RST and state. DX stations will use RST and power, so expect to hear a lot of "K's" this weekend.

February 22-23

The only approved activity for this weekend is the **REF HF Contest, CW**. Multipliers are the 97 French metropolitan departments and overseas territories. Our exchange is RST and serial number. With no other contests this weekend, let's make a good showing in this one.

February 29 – March 1

Leap year gives us one more February weekend. The big contest this weekend is the **North American QSO Party, RTTY**. All of the NAQPs are fun with everyone limited to 100 watts maximum, so Little Pistols can compete well with the usual Big Guns. Up to five participants can join together to form a team to compete in the NAQP team competition. After identifying the name of the team and its members, there is nothing else different. Just get on and operate as a single-op station as your usual self. The scores of the individual team members are automatically combined by the sponsor. George, K5KG, is forming FCG teams, so contact him if you are interested. Last year, we only had 2 teams in the Winter contest, but we had 5 teams in the Summer event. Can we beat that this year?

If you not a RTTY operator, then you might want to take part in one or both of the weekend's state QSO parties. It's the "Carolinas Weekend." The **South Carolina QSO Party** starts it off on Saturday, followed by the **North Carolina QSO Party** on Sunday. Both SQPs include CW, SSB and all

modes of digital. As with all SQPs, the object for out-of-state participants is to work as many counties as possible, plus any bonus stations. South Carolina has 46 counties and its neighbor, North Carolina, has 100.

Four **South Carolina** counties tied for being their least contacted county last year, so this year you will receive bonus points for each valid contact with amateurs located in these four rare counties. These bonus points will be calculated by the SCQP scoring system. Do not be alarmed if this bonus isn't scored by your logging software.

North Carolina has a new bonus system this year with the "TARHEEL" Spelling Bee. There will be seven special stations with 1×1 calls spelling out the word "TARHEEL" with their suffixes. You will get extra points for each callsign plus another bonus for a sweep. The calls to look for are: N4T, W4A, N4R, N4H, N4E, W4E, and N4L. Working a sweep will not only qualify you for a very nice personalized certificate that will be sent to you electronically, but each op who achieves this will also receive, free of charge, a commemorative coffee cup to celebrate their accomplishment.

If those contests don't satisfy your crave for CW, there is also the **UBA DX Contest, CW**. This contest has Belgian provinces, Belgian prefixes and each EU DXCC country all as multipliers. Belgian contacts are worth 10 points, while other EU stations are worth only 3 and non-EU contacts are just one point.

State QSO Party Challenge

If you need another reason to participate in state QSO parties, the members of the QSOParty.io group have announced the **State QSO Party Challenge**. The annual Challenge will recognize all radio amateurs' participation in U.S. State and Canadian Province QSO parties. It will be open to anyone who operates in two or more approved State QSO Parties and who makes at least two contacts in those contests. There is no need to register. Participants must simply submit their reports to 3830Scores.com to be included in the Challenge. 3830Scores will have an up-to-date score tracking menu choice for the State QSO Party Challenge. Cumulative scores will be reported monthly on qsoparty.io and StateQSOParty.com. For more details see <http://StateQSOParty.com/>.

Other Significant Activities

The Spring **ARRL School Roundup** is February 10-14. Designed to foster contacts with and among school radio clubs, stations exchange QSO information with club stations that are part of an elementary, middle, high school or college. Non-school clubs and individuals are encouraged to participate. The contacts that you make just might call you in a contest soon.

Continuing with the youth-oriented theme, the **North American Collegiate Championship, RTTY**, will be on the weekend of February 8. This is an opportunity for College Club stations to compete with any college and university in North America, nationally or against specific rivals. They will use a Live Online Scoreboard for the college competition. You will be able to watch all or some of the other colleges as you choose. The contest coincides with and follows the rules of the NAQP, with a few exceptions.

Summary

Contest	Type	Date	Time	CW	SSB	RTTY	Other Digital
Vermont QSO Party	QSO	1-Feb	0000Z	C	S	R	D
Black Sea Cup International	DX	1-Feb	1200Z	C	S		
Mexico RTTY International Contest	DX	1-Feb	1200Z			R	
Minnesota QSO Party	QSO	1-Feb	1400Z	C	S	R	
British Columbia QSO Party	QSO	1-Feb	1600Z	C	S	R	
North American Sprint, CW	Major	2-Feb	0000Z	C			
CQ WW RTTY WPX Contest	Major	8-Feb	0000Z	C			
Dutch PACC Contest	DX	8-Feb	1200Z	C	S		
ARRL Inter. DX Contest, CW	Major	15-Feb	0000Z	C			
CQ 160-Meter Contest, SSB	Major	21-Feb	2200Z		S		
REF Contest, SSB	DX	22-Feb	0600Z		S		
South Carolina QSO Party	QSO	29-Feb	1500Z	C	S	R	D
UBA DX Contest, CW	DX	1-Feb	1300Z	C			
North American QSO Party, RTTY	Major	29-Feb	1800Z			R	

As you can see, this month has something for any taste, major contest or small, CW, SSB, RTTY or other digital. If you have never contested, everyone has a first time. Give one of them a try.

Before participating in any of these contests or events, please familiarize yourself with the frequencies, exchanges, rules, etc. associated with the event. The WA7BNM Contest Calendar (<http://www.contestcalendar.com//index.html>) can provide most of the information, as well as a link to the contest's home page, which will have the rules, give you a "flavor" for the contest and let you know about any bonus stations or plaques awarded.

RadioSport (Amateur Radio contesting) is a diverse and somewhat complex subject area. If you have any questions about contesting or any suggestions or comments about this column, please address them directly to Stan Zawrotny, K4SBZ, at K4SBZ.Stan@gmail.com.

Ham Happenings

From	To	Prefix	Call, () is the IOTA designation	DX
01-Feb	???	PJ4	PJ4/PA1KE	
01-Feb	???	TT	TT8SN	
01-Feb	???	ZL7	ZL7DX	
01-Feb	01-Apr	P2	P29ZL	
01-Feb	01-Apr	A7	A75GR	
01-Feb	01-Apr	P2	P29ZL	
01-Feb	01-Feb	CE9	IA0/DK5SXQ, IA0DC	
01-Feb	01-Feb	YO	YR2019REV	
01-Feb	01-Mar	J7	J79WTA	
01-Feb	01-Mar	C5	C5YK	
01-Feb	01-Nov	A3	A35JP	
01-Feb	02-Feb	HR	HR9/WA4DT (NA-057)	
01-Feb	03-Feb	G	GB200FN	
01-Feb	04-Apr	HR	HR5/F2JD	
01-Feb	04-Feb	TI	TI5/W4GKR	
01-Feb	05-Feb	6O	6O1OO	
01-Feb	06-Apr	HS	HS0ZME	
01-Feb	08-Feb	CE9	VP8HAL	
01-Feb	08-Feb	K	WA5LFD (NA-092)	
01-Feb	09-Mar	FG	FG/F6ITD, TO7D	
01-Feb	12-Apr	VK9/N	VK9NK	
01-Feb	18-Feb	DL	DL5HAI (EU-129)	
01-Feb	21-Feb	CE9	KC4USV	
01-Feb	22-Feb	VU	AT1RS	
01-Feb	25-Dec	9K	9K71QND	
01-Feb	28-Feb	9M2	9M2MRS	
01-Feb	28-Feb	CE9	DP0GVN, DP1POL, ZS7ANF	
01-Feb	28-Feb	CN	CN2JF	
01-Feb	28-Feb	P4	P4/K3DMG	
01-Feb	28-Feb	V3	V31GW, V31YN	
01-Feb	28-Feb	VE	VE8RST	
01-Feb	31-Dec	T6	T6AA	
01-Feb	31-Mar	UA	R200ANT	
01-Feb	31-May	9J	9J2MYT	
04-Feb	18-Feb	5H	5I4ZZ, 5I5TT (AF-032)	
12-Feb	12-Apr	VK9/N	VK9NK	

15-Feb	16-Feb	P4	P40W
15-Feb	16-Feb	PJ5	by KG9N
15-Feb	16-Feb	V2	V26M
20-Feb	04-Mar	TI	TI5/AA1M, TI5/W1USN
20-Jan	31-Dec	5B	5B60AIF
21-Feb	05-Mar	VP8/O	VP8/VP8DXU
21-Feb	23-Feb	KP4	KP3RE (NA-249)
27-Feb	28-Mar	PJ7	PJ7AA

source s - The Daily DX, 425 DX News, or DX Zone

Capital District ARES group tests local repeater footprints

On Saturday morning, January 25, about 17 local hams roamed about the Big Bend testing or determining the footprints of 7 or 8 of the area's repeaters. Hams from the Big Bend Counties participated, and repeaters in Liberty, Gadsden, Jefferson, Leon, and Wakulla Counties tested. The results were mostly as expected. Connections from home stations with good antenna systems fared better than from cars with only mag mount antennas. Also, generally the farther away stations were from repeaters had greater difficulties especially when using car mounted antennas. Yet, the exercise clearly demonstrated that the several repeaters in the Big Bend have good reception throughout the area with the 147.03 repeater doing the best and the 146.91 machine doing almost as well. The Jefferson repeater, which has just been recently upgraded, presented solid results. Significantly, it could reach into the southern part of the county, which is important information because in case a hurricane comes to the Big Bend the National Weather Service is interested in coastal data such as wind and tide data. Similarly, KG4ITD's repeater, and the Gadsden County machine, gave solid results in stations in Leon and Jefferson Counties.

The following stations participated, and our thanks go to them for the good job done: AG4UU, KN4FCC, K4NRD, AI4KA, KM4tTS, KMN4BRR, W4JJJ, K4CRO, KC4VPJ, KM4LUI, KN4UXI, W4LCR, VE3AIH/W4, KB2NUI,KG4TOD, K4ARQ, WA4WES

The History of Radio- Michael Faraday and James Clerk Maxwell.

Last month we looked at some of the 17th century pioneers in electricity and radio. Earlier we had mentioned Isaac Newton and the massive contributions he made to physics. In particular, in order to explain, rationally, the orbits of the planets, he had to reject Aristotle's claim that the earth was at the center of the universe and that the planets, the sun, and the stars had orbits, however, strange, around the earth. In one of the those "obvious after the fact" reformulations

Newton put the sun at the center of the universe and had the planets orbit it. They were held in place, not by God's angels, but by something he would call gravity, and he further said that the force of attraction between two bodies was inversely proportional to the square of the distance between them, or $F = Q1 \times Q2 / R \times R$.

Now, while Newton invented or discovered the idea of gravity, even Aristotle had recognized that objects will fall to the earth when dropped from, say, a building. His explanation for this common observation was that the earth fell to the earth because it was joyously reconnecting with its origins, or something as useless.

Over the course of the next hundred and thirty or so years, other men explored the mysteries of the new force that would be called electricity, and while they did important, vital work for what came later, their discoveries largely stayed in the laboratory as curiosities. That will change in the 19th century.

Hans Christian Oersted made the first discovery that would soon have practical application. He discovered that if you placed a wire that had an electrical current over or near a compass needle it would deflect. That would perhaps have stayed there except that men soon began to wind wires around iron rods and put them in a magnetic field, and watched it align itself with the "north" and south" poles of the field. Then someone reversed the polarity of the magnetic field and the iron rod, which was suspended by a string rotated and realigned itself with the new north and south poles. Well, it did not take long before someone had made a DC motor, and, it was not long after that that someone reversed the process and with a magnetized iron rod rotating in a magnetic field, electricity was created. .

But as interesting and important as that was, our focus is on Michael Faraday, the key figure in the development of radio. Michael Faraday would today be described as a child prodigy. He was born in 1791 in what is now south London, England. His father was a blacksmith and his mother had a calm spirit and supported her son through his difficult life. Times were hard for the Faraday family, and there were days it was on the verge of starvation, and the story is told that he once was given a loaf of bread and had to make it last a week. Faraday had little, and really, no formal schooling, and learned how to read, write and "cipher" at Sunday School. Yet, he was a curious and ambitious child, made all the more so when his father became sick and had a difficult time supporting his family.

As was common for the age, young boys would be apprenticed, or trained with a local craftsman. Over the course of several years, boys as young as 11 or 12 years old would learn a trade, so that by the time they were, say, 20 years old they were skilled enough to practice it.

Young Michael Faraday followed in this tradition, and his parents, or

probably more likely, his father, had him apprenticed to a book binder.

Sir Humphry Davy was the leading chemist of the age, and would become known as the father of modern chemistry. At some point he gave a Chemical lecture, and young Faraday, hearing about it, attended the class. He took notes of what Davy had said, returned to the bookbinding shop and bound his neatly copied notes into a book of sorts. He then sent it to Davy as a gift, but with a request for a job. Davy was impressed with Faraday's gift, but had no opening for him. That changed sometime later, when he fired his assistant for brawling. He hired the young Faraday, and that began a long working relationship that changed the world.

Now Faraday worked with Davy on various chemistry projects, but in time the apprentice began to develop an interest in the new field of electricity. He did some experiments, one being where he wound insulated wire on one half of an iron ring, and connected it to a battery and switch. On the other side of the ring, he had wound another wire around it. When he closed the switch, he discovered a sudden spike in current or voltage in the second wire. What was as mysterious, there was a negative spike when he disconnected the battery from the coil. Today, we would say that turning on the switch created a transient voltage or current.

Later he discovered that when a magnet was moved in and out of a coil of wire, an induced electrical current was created in the wire. Within a year of Faraday's discovery, a small hand-turned generator in which a magnet revolved around coils was demonstrated in Paris, and by 1850 generators were manufactured commercially in several countries.

Faraday began to theorize what was happening. Others had said that there were particles in the wire that made the flow of electricity, sort of like water in a pipe is a force. Faraday rejected that idea, and said the force was in the field or area around the wire. Now this was a descriptive explanation. It was correct, but it had little practical application because like Aristotle's explanation for bodies falling to earth, not much could be done with it. But he was correct, current going through a wire created a magnetic force field around the wire. Indeed, if you could somehow put an object next to the wire, it would rotate around the wire, and the magnetic field around a current carrying wire was a cylinder. And the curious thing was, you could measure this circular force the farther you moved from the wire. It was, however, subject to Newton's inverse square law, but that was OK.

Now Faraday, for all of his genius, was limited in his ability to mathematically describe what was happening. But, not to worry, another great English scientist, James Clerk Maxwell, provided the mathematical justification and explanation for Faraday's brilliant experiments and deductions.

Unlike Faraday, Maxwell was born into what we would now call a middle

class family in 1831 in Edinburgh, Scotland. Also unlike Faraday, Maxwell received an education and was almost from his earliest years recognized as a genius, particularly in Mathematics. He will stay in academic life

In time he looked at Faraday's work and conclusions, and derived from them, what is now known as his famous Maxwell equations. Without going into a long discussion of partial differential equations, let me just say that translated into English, they propose that electromagnetic energy behaves like a force field and moves from its origins outwards in an inverse square manner.

While Maxwell had synthesized electricity and magnetism into one theory, he had regarded them as essentially two interdependent phenomena; Albert Einstein, with his general theory of relativity, showed that they were two aspects of the same phenomenon.

So, by 1873, and in hindsight, the theoretical basis for radio waves had been established. What we now needed was a way to translate this theory into National Public Radio. To do that, we need to look at Heinrich Hertz and Guglielmo Marconi, which we will do next month.



TARS Officers

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