



THE COMMUNICATOR



Mailing Address: P. O. Box 976, Nokomis, FL 34274

W4AC Repeaters: 444.100 MHz (DMR) & 146.805 MHz (-) (PL100Analog)

Incorporated 1984

<http://www.tamiamiarc.org>

January, 2019

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President's message.....KB1HIP

As I mentioned in last month's "Communicator", we held a Technician class course this month at the Jacaranda Library. Twenty nine students signed up for the course. Fifteen completed the course and eleven passed the exam given by our Volunteers Examiners (VE) team.

Thanks go out to Paul Nienaber, KN4BAR, who organized the course and taught several lessons, and Chet Fennell, KG4IYS, who also taught lessons. I was happy to assist as well. Thanks are also appropriate for our VE Team headed by Steve Phillips, WA1ZKN, who administered the exam at a special test session, held at the Coast Guard Auxiliary Station.

As a result of the work from our members in all areas of our organization, I am pleased to announce that we now have one hundred one (101) members in our club. This is a tremendous accomplishment that we should all be proud of. Let's continue the good work in the next year.

We finished the last event of the year with a wonderful Christmas party at Valenti's Restaurant. Our thanks go to Jim Shortill, KJ4NDO, San Yoder, K3SY, and Frank Wroblewski, W2XYZ, who planned and managed this activity and to Tom Porada, W4IEE who recommended the venue. We all enjoyed it very much.

We look forward to a New Year with a combination of old and new leadership that will help us keep our radio club active and fun to be a part of. The returning officers are Gary Hagens, K6OC, as Vice-President, Jim Shortill, KJ4NDO, as Secretary, Frank Wroblewski, W2XYZ, as Treasurer and I, KB1HIP, as President. Board members will be Peter Boers, KV4LR, Larry Bryan, W8LIG, Guenther Henning, AJ4QX, Paul Nienaber, KN4BAR, Chet Fennell, KG4IYS, San Yoder, K3SY and Steve Phillips, WA1ZKN.

In addition to their board responsibilities, San Yoder will continue editing the "TARC Communicator", Steve Phillips, WA1ZKN, will coordinate the monthly FCC sanctioned Volunteer Examiner (VE) Amateur Radio testing, Chet Fennell will maintain the membership database and Tom Porada will be our public relations coordinator. I want to thank Don Jansen, K14VGE, Tom Porada, W4IEE, and Tom McDermitt, W3GXV, for their past service on the Board.

We are planning three activities in January. First, on Thursday, January 3, we will activate the Boca Grande/Gasparilla Light Houses, USA 910 and USA 066 as part of the Amateur Radio Light House Society (ARLHS) Christmas Lights program which runs from December 15 to January 4, 2019. Second, we will hold an equipment auction at the January TARC monthly meeting. And third, we will participate in the Winter Field Day (WFDA) event on January 26 and 27, 2019. We will finalized the details of the WFDA at our January TARC meeting.

In closing, I want to wish everyone a Happy and Prosperous New Year.

VY 73 to all, de Andy-KB1HIP

Next meeting January 9, 2019

Our meeting will start at 7:00 PM on Wednesday, 09 January, 2019 at the Coast Guard Auxiliary Training Center, 1200 South Harbor Drive.

Next Month

Auction & Winter Field Day Reports

TAMIAMI AMATEUR RADIO CLUB *Minutes of the 12/12/18 Meeting*

The meeting was called to order at 7:00 PM by President Andy Durette, KB1HIP. The pledge to the flag followed. Introductions were made by name and call sign.

MINUTES: President Durette requested a motion to accept the minutes of the November 14, 2018 meeting as published in the Communicator. Motion was made, seconded and approved.

CORRESPONDENCE: A credit card solicitation was received. It was torn up and trashed.

TREASURER'S REPORT: Treasurer Frank Wroblewski, W2XYZ, reported an ending balance of \$4,376.52.43 as of November 30, 2018.

SUNSHINE: N/A

VE TESTING: Steve Phillips, WA1ZKN, reported that Mark, visiting on vacation from KY, upgraded from Technician to General. A second candidate took the Extra exam, but just missed a passing score.

LIAISON TO QCWA: QCWA meeting was held at Denny's Restaurant on Bee Ridge Road, Sarasota, FL at 11:00 AM, December 3rd. There were 26 members, spouses and guests present. Hans Napfel, WB2ZZB, presented a program on the growth of communication and writing skills as humanity developed.

REPEATER / TECHNICAL: Frank Wroblewski, W2XYZ, reported that the digital repeater 444.10 MHz had developed some problems, but he thought that they would be remedied soon. The frequency for digital operations is TAC 311. The Club 2-meter analog repeater is 146.805 MHz (-) PL 100. The digital net opens Tuesday at 7:30 PM. The 2-meter net opens Thursday at 7:30 PM. The 10-meter net on frequency 28.450 MHz, upper side band, begins immediately after the conclusion of the 2-meter net. This 10-meter frequency was chosen so Novice/Technician licensees could participate.

MEMBERSHIP: There are 67 regular members, 17 first-year free, 0 Student, 7 life and 1 comp, for a total of 92 members.

PUBLICITY: Please contact Tom Porada, W4IEE, if you have an idea for an article or someone asks for club information.

OLD BUSINESS: 1. Christmas Party: The Valenti restaurant was chosen for the Christmas party. The party will be held on December 13th at Valenti's Restaurant, 1200 East Venice Ave., Venice, FL. Schedule of events: 4:00 PM - 5:00 PM, fellowship and cocktails. 5:00 PM - 7:00 PM, dinner. Please see the December Communicator, page 7, for the menu and other details. The Communicator is available for drawdown on the web site: www.tamiamiarc.org

2. Auction: Our club equipment auction is scheduled to be held after the meeting on January 9, 2019. Please contact Jim Shortill, KJ4NDO, if you have additional items to contribute to the auction. A list of items to go under the hammer is published in the December and January Communicator. A number of members volunteered to serve as auction helpers. Jim Shortill will contact them in January to begin organizing the event.

3. Technician Licensing Course: Paul Nienaber, KN4BAR, primary instructor, noted that the technician course started with 27 students, but ended with 18 students. 17 students indicated that they will sit for the FCC exam in December. The remaining student and other students who have been delayed by circumstances, will take the exam in January.

NEW BUSINESS: 1. Light House Christmas Lights: Andy Durette, KB1HIP, advised that this event will start December 15, 2018 and last till January 4, 2019. This event is sponsored by the Amateur Radio Lighthouse Society, (K2JXW), see: www.arlhs.com. Andy is planning to operate from Boca Grande/Gasparilla lighthouse, numbers USA66 and USA 910. Andy inspected both lighthouses and noted that the Boca Grande lighthouse has tables, ample space and electricity under the Museum section. He would like to be contacted by members who would be interested in participating in this one day, daylight event.

2. Winter Field Day: Winter Field Day is held on January 26 and 27, 24 hours, from 2:00 PM Saturday to 2:00 PM Sunday. Paul Nienaber is setting up a station in the North Jetty park under our comfy TARC tent. Members can work stations around the world in a park-like setting under the new club tent. Members wishing to polish up their early-hour operating procedures will find this event a great opportunity to practice radio

Continued >>>>>

Minutes, con't

operational skills. Paul passed out a signup sheet, and members volunteered for set-up and operation duties. Members who were not at the meeting and want to participate, please contact Paul.

3. Club Elections. Section 22 of the club by-laws sets out the process for elections. San Yoder, K3SY, acting as the nominating committee, presented **Andy Durette, KB1HIP as President, Gary Hagens, K6OC, as Vice President, Jim Shortill, KJ4NDO, as Secretary, and Frank Wroblewski, W2XYZ, as Treasurer.** These gentlemen having previously served in the same positions, agreed to serve for another year.

For Directors, the Nominating Committee put forward the following:

Peter Boers, KV4LR, Larry Bryan, W8LIG, San Yoder, K3SY, Guenther Hennig, AJ4QX, Steve Phillips, WA1ZKN, Paul Nienaber, KN4BAR, and Chet Fennell, KG4IYS.

There being general agreement as to the composition of the Officers and the Board of Directors, a motion was made to accept the slate of officers and directors as presented. The motion was seconded. There were no objections. The issue was put before the membership for voice vote. The membership unanimously agreed. The candidates for Officers and Directors were declared elected for the year of 2019. Outgoing directors Don Jansen, K14VGE, Tom McDermitt, W2GXV, and Tom Porada, W4IEE are thanked for their service.

4. Reorganization of Emergency Amateur Radio Support for Sarasota County:

Sarasota Emergency Amateur Radio Operations is under reorganization. Paul Nienaber, KN4BAR, reports that the county is discussing how best to establish an Amateur Radio Emergency Service (ARES) organization for the county. The ARES unit will replace previous entities. The ARES organization will be open to all hams. As many details are in flux, the club, by motion made, seconded and approved, authorized Paul to continue to attend Sarasota EOC meetings as an observer. In addition, Paul will approach Venice Regional Bayfront Hospital to attempt to re-initiate possible club assistance to Venice Regional Bayfront Hospital with respect to their ham radio needs.

Paul will report back to the club on the status of both of these initiatives.

The 50-50 drawing of \$25.00 was won by Tom Babcock, KN4ONE.

The meeting was adjourned at 8:10 PM. There were 35 members and visitors present.

The program was presented by Hans Napfel, WB2BBZ: communication and writing skills in the development of Homo Sapiens



Local Hamfests

Tampa - January 12 - www.hamclub.org

Ft. Myers - Jan. 18 - 19 - swflhamfest.onfo

Arcadia - Jan. 26 - desotaarc.org

Winter Field Day is a GO! The club will setup and operate multiple stations at the North Jetty park in Nokomis for this event. Setup starts at 10 am on Saturday, January 26th. We will operate for 24 hours until Sunday, January 27th at 2 pm. So far we have 6 members signed up for the event.

We will have the club station and Andy's antenna, a generator, our great looking club popup tent, an end fed 80-10 wire antenna, and perhaps a contingent of FT8 operators as well, We have a special access permit from the county to occupy the site overnight. A signup sheet will be passed around at the January club meeting, or you may contact Paul, KN4BAR, directly at 941-468-3843 or by email to paul9aber@gmail.com if you want to participate.

ORLANDO
HamCation 2019 February 8th, 9th & 10th

Come and Experience the Largest Amateur Radio and Electronics Show in the Southeast!

CENTRAL FLORIDA FAIR AND EXPOSITION PARK
4300 West Colonial Drive, Orlando, Florida 32808

FTDX-1200 Saturday GRAND PRIZE
TS-890s Sunday GRAND PRIZE
TH-973a Early Bird PRE-REG PRIZE

- Special Guest Speakers
- Many Lectures and Forums
- Over 150 Commercial Booths
- Over 200 Swap Tables
- Massive Tailgate Area
- Hourly Door Prizes
- RV Camping on Premises
- Free Area Parking
- Family Friendly Atmosphere
- Theme Parks Nearby

February 8th: 9AM-5PM | February 9th: 9AM - 5PM | February 10th: 9AM - 2PM
Courtesy Talk-In on 146.760 (103.5pl) 146.820 (D-star K1XC C and REF037C) 443.050 (103.5pl)

HOME OF THE 2019 SOUTHEASTERN DIVISION CONVENTION
Visit WWW.HAMCATION.COM to sign-up for our e-flyers.



DX Jack's page....

..... By Jack Sproat, W4JS

MAJOR CURRENT/UPCOMING DX ACTIVITY & PROPAGATION HIGHLIGHTS

CURRENT and/or SCHEDULED DX ACTIVITY										
COUNTRY – CALL SIGN	ACTIVITY PERIOD	BEARING	HF BANDS and OPENING TIMES (UTC)							
			80	40	30	20	17	15	12	10
Vanuatu – YJ0AFU by VK4AFU, FT8/CW/S	Now to 08 Jan	262	NO	06-13	05-15	04-18	19-23	19-00	20-23	20-22
Thailand – HS0ZLS by HB9FIH	Now to 10 Jan	<u>355/175</u>	NO	22-00	09-14	2400	<u>1700</u>	<u>13-15</u>	<u>14-15</u>	NO
So. Cook Is – E51DWC by OK1DWC, CW/D	Now to ????	246	06-10	03-13	02-15	13-10	15-01	17-01	18-03	20-23
Madagascar – 5R8IC by F6ICX, **, Digi, SB	Now to 01 Feb	90	NO	00-03	22-06	18-01	12-22	13-21	13-19	NO
New Caledonia – FK/F6OBD, Digital	Now to 20 Feb	258	Nil	06-12	05-14	04-18	14-00	19-00	20-23	20-22
Antarctica – R1IANW by R3IW, mostly FT8	Now to 01 March	180	03-06	01-09	23-09	21-07	12-00	12-23	18-22	NO
The Gambia – C5YK by ON7YK, ++, Digital	Now to 09 March	88	23-07	21-06	19-00	12-23	13-19	14-18	17-18	NO
Gabon – TR8CR by F8EN, CW/SSB	Now to 16 March	88	--	23-07	21-07	17-00	12-22	--	--	--
Sri Lanka – 4S7KKG by DC0KK, mostly FT8	Now to 01 April	<u>28/208</u>	NO	NO	NO	13-14	<u>14-18</u>	<u>14-17</u>	<u>15-16</u>	NO
South Sudan – Z81D by Y1IDZ, Digital/SSB	Now to 10 June	74	00-03	22-03	20-02	17-01	12-22	13-21	14-19	NO
Tuvalu – T2AR by 3D2AG, CW/FT8	01 to 31 January	267	Nil	05-13	03-14	18-01	18-00	2300	NO	NO
Seychelles – S79AA by OM6MBG, CW/SSB	05 Jan to 02 Feb	68	Nil	22-03	21-04	13-22	12-20	13-19	14-17	NO
St Kitts & Nevis – V47UR by 2-op team	08 to 20 January	114	21-13	00-24	00-24	12-00	12-22	13-22	14-20	1500
Sierra Leone – 9LY1JM by 8-op team	09 to 21 January	91	23-08	20-10	19-11	09-23	11-22	12-20	13-18	1400
Galapagos Is – HC8GET by OE3GEA	13 to 25 January	196	--	--	00-24	00-24	13-24	13-23	14-22	15-22
Chatham Is – ZL7/JA0JHQ, CW/FT8	17 to 29 January	230	--	05-12	04-14	23-10	18-01	18-00	20-23	NO
Rwanda – 9X2AW by DF2WO, all modes	19 Jan to 14 Feb	81	Nil	23-05	21-02	17-00	12-23	13-22	14-19	NO
Palau – T88PB by JA0JHQ, CW/FT8	25 to 28 January	307	Nil	10-12	07-14	21-00	22-23	2200	NO	NO

Updated 25 December based on 17 December *The Weekly DX*, <https://dx-world.net/> and <http://www.ng3k.com>

Notes: Times shown are for 60% or better opening probability; ??? = Call Sign not yet known; ++ = Mostly SSB; ** = Mostly CW; NO = No Opening forecast. Long Path bearings and opening times are underlined. Propagation forecasts are calculated using *W6ELProp* propagation software, <http://www.voacap.com/hf/> and, where possible, VOACAP predictions based on current or recent operations.

-- DECEMBER SOLAR ACTIVITY --

Through 25 December, the 10.7 cm Solar Flux ranged from 67 to 73, with a mean value of 70.2 (vs. 74.0 for Dec 2017 and 75.2 for Dec 2016). The A_p index was ≥ 7 on 10 days. The Sun was spotless on 17 days thru 25 December.

-- JANUARY FORECAST --

Solar activity is expected to be very low throughout the month of January.

No proton events are expected at geosynchronous orbit.

The greater than 2 MeV electron flux at geosynchronous orbit is expected to reach high levels on 06-12 Jan with moderate flux levels expected on 04-05 Jan and 13-19 Jan. Normal levels are expected throughout the remainder of the month.

Geomagnetic field activity is expected to reach active levels on 04 Jan, 16 Jan, 25 Jan and 30 Jan due to recurrent CH HSS influence. Quiet to slightly unsettled conditions are expected throughout the remainder of January.

The 10.7 cm Solar Flux Index should range from 69 to 72; averaging 70.7 during January.

(From *NOAA Weekly Highlights and Forecasts*, 24 Dec 2018, *NOAA 27-day Space Weather Outlook Table*, 24 Dec 2018, and *45 Day AP Forecast*, USAF, 24 Dec 2018.)

-- GALAPAGOS ISLANDS --

Gerhard, OE3GEA will be active from the Galapagos Islands (Isabela and San Cristobal) as

HC8GET during January 13-25, 2019. No info regarding modes.



-- VIETNAM IN FEBRUARY --



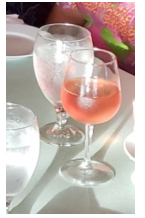
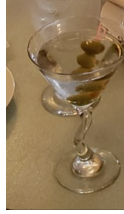
SP2FUD and SP2GCJ will be active from Vietnam as XV9FUD and XV9ZT during February 5-18, 2019. QRV on HF. More info to follow.

JCRC Celebrates at Valenti's



Holiday

Cheer !!



Don't miss the auction at our January meeting !

List of "experienced" treasures to be sold

#	Item	Make	Model	Our Notes	Your Notes
1A	HF Rig	Icom	IC-735		
1B	Power Supply	Icom	PS-55		
2	Noise Bridge	Palomar Eng	R-X Noise Bridge		
3	Desk Mic	Icom	SM-8		
4	Antenna	NA	CB Antenna	BNC connector, for handi-talkie	
5	SWR Bridge	Diamond	SX-1000	430 Mhz - 1300 Mhz	
7	Antenna Analyzer	MFJ	MFJ-247		
8	VHF Mobile	Alinco	DR-135	needs work - voltage reg. chip?	
9	Desk Mic	Icom	SM-20		
10	Audio Equalizer	Realistic	31-1988A	5-band stereo equalizer	
11	Keyer/paddle	MFJ	MFJ-422B-X	integrated Bencher paddle w/ batt.	
12	Antenna Tuner	MFJ	Differential -T Tumer	3KW Roller Inductor Tuner	
13	Power Supply	Pyramid	PS-25G	needs work	
14	Desk Mic	Kenwood	MC-50	Discontinued Item	
15	Speaker	Icom	SP-20		
16	HF Rig	Icom	IC-706MKIIG	Includes Heil ICM mic	
17	DSP	Radio Shack	21-543		
18	Audio Equalizer	Optimus	31-2025	10 Band Stereo Equalizer	
19	Rotor Controller	Alliance	HD-73-1	Dual Speed	
20	Antenna Tuner	MFJ	MFJ-949D		
21a	HF Rig (Qty 2)	Yaesu	FT-101ZD	Lot is both rigs - one for parts only	
21b	Speaker	Yaesu	SP-901P	May include phone patch	
22	Antenna base	DX Engr.	Tilt base		
23	Foot Switch	Footrol	Type MA		
25	Hand Mic	Yaesu	MH-27	Does not work	
26	Desk Mic	Astatic	D-104	G Stand	
27	Low Pass Filter	Drake	TV-3300LP		
28	Low Pass Filter	E.F. Johnson	Low Pass Filter		
29	Antenna Switch	Heathkit	HW-1234		
30	Mobile Speaker	Motorola			
31	Coax Choke	Homebrew	Ugly Balun	15 tns RG-8 on 6" core w/UHF conn.	
32	Dummy Load	MFJ	MFJ-262	1KW Dry dummy load	
33	Desk Mic	Yaesu	MD-1c8	Tested good - really nice condition	
34	Hand Mic	Yaesu	MH-27B8	No audio	
35	Mag mount ant.	Larsen	NMO 2/70	with mag mount	
36	Mag mount ant.		2m/440		
37	Mag mount ant.		2m/440		
38	VHF Mobile	Kenwood	TM-261A		
39	CB Mobile	Uniden	PC-122XL		
40	VHF Mobile	Alinco	DR-1200T	Seems to be dead	
41	Power Supply	Astron	RS-35M	35A Linear with meters. Exc. cond.	
42	Base antenna	Comet		440 base antenna	
43	Base antenna		6 el 440 beam		
44	Base Antenna	Diamond	A144S5	5 element 2m beam	
45	Marine Mob. Ant.	Raytheon	DB-12-C	156-163 MHz fiber, some tip damg.	
46	VHF Mobile	Yaesu	FT-5100	2m/440	
47	Power Supply	Innovat. Tch.	Com Series 30	12v/30A	
48	HF antenna		Multi Band Dipole	window line feed	
49	HF	Alpha Delta	Multi Band Dipole	Coax feed, 40m reported not working	
50	Power Supply	Cobra	Regulated Power Pak	12v/2A	
51	TNC/Mic Switch	MFJ	MFJ-1272B	Set for Icom radio	MORE>>>>>

Have you visited tamiamiarc.org lately ??? Our club website, tamiamiarc.org, has been given a face lift and some new content. Visitors can now use the "Membership" menu to join the club, renew their membership, pay their dues online using PayPal, or view and download the most current club roster. To see the club roster, click on the "Members Only" tab under "Membership" and enter the club password for access. Use **W4AC34285** as the password.

Auction Items -- Page 2

#	Item	Make	Model	Our Notes	Your Notes
52	Power Supply	Micronta	22-120	12v/2.5A	
53	TNC	Kantronics	KPC-3		
54	TNC	Kantronics	KAM Plus		
57	Battery Charger	Schumacher	SE-82-6	6/2 Amp, 12V	
58	HF Rig	Yaesu	FT-890		
59	HF Rig	Yaesu	FT-890		
60	Antenna Tuner	MFJ	MFJ-949E		
61	Antenna Switch	???	4-Way		
62	Coax	RG-8x	25 feet +/-		
63	Sound Card	Signalink	USB		
67	HF Antenna	Hy-Gain	AV-640 40-10 Vertical	Some Assembly Required	
68	Antenna Tuner	MFJ	MFJ-989C Versa Tuner	Like New Condition	
69	Book	ARRL	2012 Repeater Dir.		
70	Power Supply	Pyramid	PS-26K	12v/25A	
71	Marine Mob. Radio	Unspecified	Unspecified	Works	
72	Bag O Cables		Various		
73	Coax		RG-8	Coil	
74	Quad Band Mobile	Yaesu	FT-8900R	29/50/144/440 - works	
75	Camera		Electronic	With short stand - works	
76	Networking Equip.		TV & CAT bridges		
77	CAT5 Cable		Box	25 feet	
78	Oscilloscope	Philips	PM-323 Dual Beam	With Manual	
79	PC Repair Cables			for board repair and removal	
80	Mob. Radio Mount		Black-for s/w radio		
81	Mobile Ant. Base		For whip antenna	includes extra spring	
82	Ant. control Unit				

I thought Novice licenses were history !!! What's with those KN4 calls??

Well, history repeats itself !!

By Steve, K4EU

Since the FCC issued the first "universal licensing system (ULS) systematic" KN4 + three letter suffix callsign on January 4, 2017 (KN4AAA), a note about ham radio callsign history may be in order.

KN4 + three letter suffix callsigns were first issued in 1953 beginning with KN4AAA, and ending in the early 1960's with KN4ZZZ. These were Novice class callsigns, and the licensee had privileges to operate crystal controlled transmitters on 3700-3750 kHz, 7150-7200 kHz, and 21100-21150 kHz using CW mode and a maximum of 75 watts input. The Novice license was good for one year, and after that period if the licensee did not upgrade, the license was cancelled.

If the licensee did successfully upgrade to a higher class of license, the "N" was dropped from the Novice callsign and a new license was issued. Example: KN4AAA upgraded to General and became K4AAA. The licensee then gained operating privileges of the new license class.

Some of us who have been licensed and active on the air for a long time have many ham friends who still have their original K4 callsigns which derived from their original KN4 Novice callsigns. K4BAI, K4MAN,

K4VUD, K4VTY, K4KYV and K4AVX immediately come to mind, however, there are many, many others. All of these fine gentleman started their ham radio lives as Novices with KN4 calls before upgrading and dropping the "N" and are known as K4's today.

I find it interesting to be aware of this history (or trivia). Once the KN4 callsign block is exhausted sometime in 2019, the KO4 callsign block will be opened and issued to new hams.

Those new hams of today who receive KN4 callsigns might appreciate this glimpse back into ham radio history, and understand that two or three generations ago someone else was first issued your KN4 callsign, and operated CW on 3700-3750 kHz, 7150-7200 kHz and 21100-21150 kHz using a 75 watt crystal controlled transmitter.

Indeed, this is a rare occurrence of ham radio history repeating itself. New hams are probably unaware of this.

Anyone interested in learning more about ham radio callsign history are invited to read this article--<https://www.eham.net/articles/38849>

73.....//Steve K4EU

Everything you always wanted to know about AFCIs

(but were afraid to ask).

By Steve, WA1ZKN

AFCI? What's an AFCI? This is the question I was asking myself last year when I first tried to get my station up and running in my new-construction house here in the West Villages. I had started transmitting and immediately it seemed that every breaker in the house tripped. My transmitter only draws 4 amps at 115V so I wasn't overloading the circuit I was using for that, and why the heck were all the other circuits in the house tripping at the same time? Something strange was going on. I started asking around and several hams asked if I had any "AFCI" breakers. I had no idea. Here is what I learned.

What is an AFCI?

An Arc-Fault Circuit Interrupter is a type of circuit breaker that is designed to trip if it detects an electric arc on the protected circuit. For example, a defective extension cord with intermittent contact between the hot and neutral, or a screw or nail that penetrates in-wall wiring. According to Wikipedia, arc-faults are a leading cause of residential fires. Per the National Electrical Code (NFPA 70) AFCI breakers have been required on almost all 15 and 20 amp residential inside circuits since about 2014 (earlier versions of the NEC required AFCI only in bedrooms). Note that the AFCI requirements are in addition to Ground Fault Circuit Interrupter (GFCI) requirements.

How does an AFCI work?

Unlike a standard 115V breaker, which only connects in the "hot" side of a circuit, the AFCI operates by monitoring both the hot (black) and neutral (white) wires of the circuit for the electronic signature of an electrical arc. The AFCI contains Digital Signal Pro-

cessing equipment that analyzes the waveforms on the branch circuit for what looks like an arc. Once a matching signature is detected for a certain period of time, the breaker trips, killing off the arc and hopefully preventing a fire from starting.

I don't want my house to burn down, so this all sounds great. What's the problem?

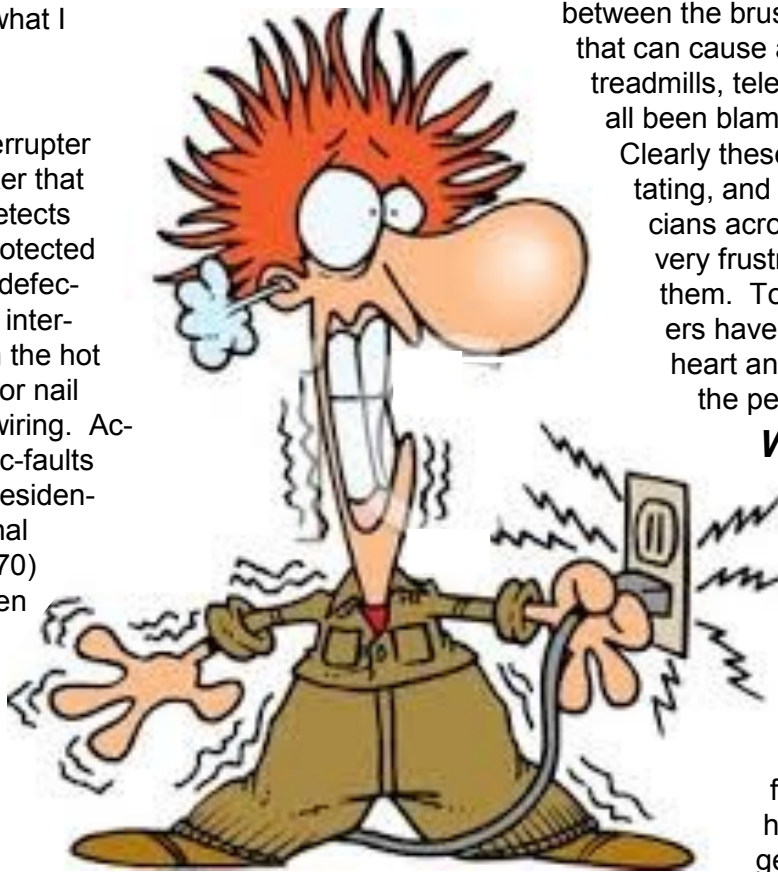
Two words – Nuisance Trips. The problem is that the arc detection system in the AFCI can be confounded by RF energy or arcs that are not a safety issue. For example, vacuum cleaners, hair dryers and power tools with brush-type motors can have arcs between the brushes and the commutator that can cause a trip. Laser printers, treadmills, televisions, and CFLs have all been blamed for nuisance trips.

Clearly these nuisance trips are irritating, and homeowners and electricians across the US have been very frustrated in dealing with them. To be fair, the manufacturers have taken these concerns to heart and are working to improve the performance of the units.

What is the impact on Amateur Radio?

The arc signature the AFCI is looking for includes an RF component. Therefore, AFCIs are susceptible to tripping when exposed to RF fields. Since our entire hobby centers around the generation of RF fields, you can see where there is

a potential problem. In 2013 the ARRL started receiving reports from hams of AFCIs tripping due to amateur radio transmission. The League set a test fixture in their lab and, using W1AW as a source, tested various makes and models of AFCI breakers. In particular, Eaton AFCI breakers were found to be particularly sensitive on 20m, 17m, 15m, and 12m. To their credit Eaton has been very responsive and >>



Arc fault circuit interrupters, continued.....

has been updating their designs and working with hams to resolve the issues.

My experience

As I related in the opening paragraph, my experience started about 18 months ago when I first set up HF station in my house in the West Villages. It turns out that I have Eaton breakers. After determining that the problem was the AFCIs tripping due to my HF transmissions, I contacted Eaton through their help desk. After making contact and discussing the particulars, Eaton sent me, free of charge, a new set of AFCI breakers (BTW, AFCI breakers are about \$40 each retail – yikes!).

Upon receipt, I noted that the breakers were marked “Gen 4”, clearly an update from what I had. After installing these new breakers, the incidence of nuisance trips was greatly reduced. It should be noted that my “antenna” consists of about 120 feet of wire, laying on my roof tiles. Therefore, the radiating element of my antenna is only a few feet away from the AC wiring for the house, that runs through the attic. I suspect that the RF from the antenna is coupling on the AC wiring and being conducted back to the breaker. I’ve rearranged my antenna wire and reduced my problem to one circuit that only trips when I transmit on 40m. I’m now playing with ferrites on the AC wiring to try and eliminate this last problem.

I also had an issue with my transmissions on 20m tripping one AFCI in my next-door neighbor’s house. He has been very understanding, and I was able to contact Eaton to get a new set of breakers for his house also. After updating his breakers, it appears

that he has no further issues. Another ham in the neighborhood is having so much trouble with his AFCIs that he is limited to QRP power levels only. He’s working to get a new set of breakers from Eaton that he, hopefully, will be able to QRO soon.

If you have a choice and you intend to operate HF from your house, it might be better to avoid Eaton AFCIs - other brands are generally less susceptible to RF.

Wrapping it up

AFCI breakers certainly provide a safety benefit, but there are some downsides. For hams, nuisance trips in our house and our neighbors’ houses can be a significant impediment to our operations. For safety and resale reasons, it’s probably best not to replace the AFCIs with a standard breaker. Rather, we should work with the manufacturer to get updated breakers with improved performance or use RF filtering/suppression to reduce the RF present at the AFCI. Here are some helpful articles on this issue:

<http://www.arrl.org/gfci-and-afci-devices>

<http://www.arrl.org/news/arrl-helps-manufacturer-to-resolve-arc-fault-circuit-interrupter-rfi-problems>

<http://www.arrl.org/files/file/Lab/Gruber.pdf>

73, Steve, WA1ZKN



Eaton AFCI internals showing the processing electronics and the solenoid that trips the breaker




Note the label and test button



Eaton AFCI - note the two terminals, the one with the white dot is for the neutral. The pigtail goes to the neutral bar in the breaker box.

January, 2019

Sun	Mon	Tue	Wed	Thu	Fri	Sat
+ 10 meter net follows the 2 meter net at 28.450 mhz		1 Breakfast @ Peaches * DMR net @ 7:30 PM W4AC 444.1	2	3 TARC net @ 7:30 PM W4AC / RPT 146.805 ** +10M net	4 Breakfast @ Peaches *	5
6	7 QCWA 11:30 AM Denny's Bee Ridge Road	8 Breakfast @ Peaches * DMR net @ 7:30 PM W4AC 444.1	9 <u>TARC meeting @ Coast Guard Training Center</u> <u>7:00 PM.</u>	10 TARC net @ 7:30 PM W4AC / RPT 146.805 ** +10M net	11 Breakfast @ Peaches *	12 TARC VE Session @ Jacaranda Public Library 10:00 AM
13	14 DARN Emergency net @ 11AM Starts on NI4CE/RPT 145.43 pl100	15 Breakfast @ Peaches * DMR net @ 7:30 PM W4AC 444.1	16	17 TARC net @ 7:30 PM W4AC / RPT 146.805 ** +10M net	18 Breakfast @ Peaches *	19
20	21	22 Breakfast @ Peaches * DMR net @ 7:30 PM W4AC 444.1	23	24 TARC net @ 7:30 PM W4AC / RPT 146.805 ** +10 M net	25 Breakfast @ Peaches *	26
27	28	29 Breakfast @ Peaches * DMR net @ 7:30 PM W4AC 444.1	30	31 TARC net @ 7:30 PM W4AC / RPT 146.805 ** +10 M net	Breakfast @ Peaches *	* Peaches opens at 6:00 AM, orders taken at 7:00.

**The W4AC 146.805 Repeater is ANALOG, PL100. [If the 2-m repeater is down, please QSY to 146.58 simplex]

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