

# FOCUS



**Journal of the  
First Class CW Operators' Club**  
[www.g4foc.org](http://www.g4foc.org)

**No. 120  
Winter 2019**



# The First Class CW Operators' Club



## President

Ray Goff, G4FON  
69 Frambury Lane,  
Newport, Saffron,  
Waldon CB11 3PU, UK  
Tel: +44 (0) 788 418 3580  
E-mail: [ray@g4fon.net](mailto:ray@g4fon.net)



## Chairman

Fred Handscombe, G4BWP  
Sandholm, Bridge End Road  
Red Lodge  
Bury St Edmunds IP28 8LQ, UK  
Tel: +44 (0) 7899 064 100  
E-mail: [fred@g4bwp.com](mailto:fred@g4bwp.com)



## Committee Secretary

James Dingwall, G4ILW  
Flat3, Baltic House,  
St. Matthews Road,  
London, SW2 1NQ, UK  
Tel: +44 (0) 776 666 2622  
E-mail: [jamesd@mac.com](mailto:jamesd@mac.com)



## Membership Secretary

Tyler Barnett, N4TY  
213 Camelot Court  
Georgetown, KY 40324, USA  
Tel: +1 859 221 9266  
E-mail: [n4ty@me.com](mailto:n4ty@me.com)



## Webmaster

Ed Tobias, KR3E  
13110 Coastal Highway, Apt. 713  
Ocean City, MD 21842, USA  
Tel: +1 410 250 7357  
E-mail: [kr3e@arrl.net](mailto:kr3e@arrl.net)



## Committee Member

Wes Spence, AC5K  
242 Oak Grove Lane  
Billings, MO 65610  
Tel: +1 409-782-7606  
E-mail: [wesac5k@gmail.com](mailto:wesac5k@gmail.com)



## Committee Member

Joe Vollbrecht, DL4CF  
Steingasse 3  
D-06642 Nebra (Unstrut), Germany  
Tel: +49 (0) 344 612 5171  
E-mail: [dl4cf@gmx.de](mailto:dl4cf@gmx.de)



## Committee Member

Pete Soby, GØPNM  
2 Willowbank  
Fraddon, St. Columb,  
Cornwall, TR9 6TW, England  
Tel: +44 (0) 7809 154611  
E-mail: [pete.soby@icloud.com](mailto:pete.soby@icloud.com)



## Committee Member

Vic Lindgren, G4BYG  
143 Hull Road  
Anlaby, East Riding of Yorkshire  
HU10 6ST England  
Tel: +44 1482 355063  
E-mail:  
[g4byg@lindgren1.karoo.co.uk](mailto:g4byg@lindgren1.karoo.co.uk)



## Committee Member

Ian Fugler, G4IY  
Lees Hill Farm  
Lees Hill, Brampton  
Cumbria, CA8 2BB England  
Tel: +44 (0)1697 745410  
E-mail: [g4iyy@live.co.uk](mailto:g4iyy@live.co.uk)

- Accounts Examiner G4HZV
- Treasurer G3XTT
- WAFOC Award Manager G4HZV
- Windle Award W4PM
- Quarter QSOs and BUG Day K5KV
- FOC WAS Award W4CK
- Webmasters N4TY, G7VJR
- Activity Co-Ordinator MØPCB

- Marathon G4FON
- FOC QSO Party KZ5D
- FOCUS Editor S57WJ
- FOCUS and News Sheet Man. Ed. r S57WJ
- News Sheet Co-ordinating Editor WB2YQH
- FOCUS Mailing G3LHJ
- FOCUS Mailing NA WB2YQH

# Contents

From Your President	Ray Burlingame-Goff, G4FON	4
From Your Editor	Gabor Szekeres, S57WJ	4
Chairman's Annual Report	Fred Handscombe, G4BWP	5
Committee Secretary's Annual Report	Michael Wells, G7VJR	5
Award Presentations at the UK Annual Dinner	James Dingwall, G4ILW	7
A Homebrew Solid State HF/6m Amplifier Project-Part 2	John DePrimo, K1JD	10
FOCers head to the Gambia	Don Field, G3XTT	16
How Do We in FOC Address the Somewhat Complex Relation to FTx?	Mats Strandberg, RM2D	20
The FT8 revolution	Roger Western, G3SXW	21
A Quick Thought About the FT8	Steph Collas, F5NZY	22
The Electro Bug -Rebirth of a Particular Speed Key	Fabio Bonucci, IKØXI	23
Suggested Methods for Increasing Your CW Speed	Jim Danehy, W9VNE	28
The VP6R DXpedition-From a Rookie's Point of View	Mike Cizek, WØVTT	30
Who Said, "Morse Code is dead..."	Andy Kersey, GØIBN	36
Good Old Days	Ken Waites, K5WK	38
2020 W5FOC Weekend	Ken Waites, K5WK	41
Contesting	Pat Barkey, N9RV	42
Welcome to New Members	Tyler Barnett, N4TY	44
Who are They?		46
Improved Band Conditions Brings Out the Members	Art Suberbielle, KZ5D	47

**Front Cover:** The picture is of the VP6R 160 meter vertical, designed and provided by DX Engineering. The building in the background is the old commercial radio station on Pitcairn, ZBP. (Photo EY8MM)

**Inside back cover:** see page 50.

**Back cover-top:** The FOC members at the 16<sup>th</sup> World High Speed Telegraphy Championship: Gabor, S57WJ; Arno, DL1CW and Steen, OZ8SW (photo S57WJ)

**Back cover-bottom:** FOC lunch in Athens: Mort, G2JL; Geo, SV1AOW and David, SV1RUX (photo G2JL)

*FOCUS is the quarterly magazine of FOC which is published four times annually in January, April, July and October. It is distributed to all members. Articles and contributions for FOCUS are always welcome and should be submitted to the Editor by mail or email <gabor.s57wj@gmail.com>, CD, disk, typed or hand written. Drawings can be re-drawn if necessary and original photographs returned after scanning.*



© First Class CW Operators' Club

Articles may be re-published from FOCUS with permission from the Editor and with the usual credit given.



## From Your President, G4FON

As I write this column, I have just finished Thanksgiving dinner with my family and am now sitting in the shack looking for stations to work.



Reflecting on the meal tonight, I could not help thinking back to the delightful Annual Dinner in Guildford where it was such a pleasure for me to be installed as your newest President. My thanks to Andy, G3AB, for his tenure of the position. He set the bar very high!

The AGM seems such a long time ago in some ways, but in others it seems only yesterday. It was so good to see everyone in person and I hope to meet other members at FOC events throughout the coming year. I will certainly be at ConDin in May.

There are considerable challenges to our hobby in these times of low sun spots. I try to get on the bands every day and use the RBN as a litmus test for propagation. Some days it lights up like a Christmas tree and on other days there are barely any spots at all. Even on the good days I struggle to find a station to exchange even 5NN with, so I guess everyone is just waiting for the sun to become spotty again! Still, I keep telling myself that there is the Marathon to look forward to. This year when you hear that puny G4FO? signal it will certainly be G4FOC as G4FOC=G4FON this time!

Season's greetings, best wishes for 2020 and see you on the bands.

161! Ray, G4FON

## From Your Editor, S57WJ

Only one week before the deadline I thought that this will be the thinnest issue in the history of *FOCUS*. A one week business trip to Indonesia came between and made the time for editing even shorter but I made it. There were some articles left in stock. John, 9V1VV, my successor, will get a few articles for the start. The articles that were not published in this issue will be appear in following issues of the *FOCUS*.



It is funny that the new editor of the *FOCUS* came from a different continent than the previous one. First it went from UK (G4BUE) to North America (K8JP/V31JP) than back to EU (S57WJ) and now to Asia (9V1VV). Many don't know that Dave, G4BUO was the one who thought I would be appropriate for editor. It lasted seven years with total of 29 regular and two special issues.

The search for the new editor was difficult. John, 9V1VV was the one who contacted me and volunteered. We exchanged some information and templates. John will also use MS Word in his work, so I can help him technically. But most important thing is to send him articles to fill the magazine.

I leave this position with mixed feelings but now this was the only way.

Last but not least, my gratitude goes to Roger, G3SXW who was my proof-reader all this time and to John, G3WGV who jumped in when it was needed.

CU on the bands! Season's greetings!  
161! Gabor, S57WJ



# Chairman's Annual Report

**By Fred Handscombe, G4BWP-FOC Chairman**

After a very busy year of celebrations for the Clubs 80<sup>th</sup> Anniversary ending with the popular dinner in Cambridge the Committee were perhaps relieved as we moved into the next year's business.

The Club continues to flourish with good levels of sponsoring and stable membership numbers. The finances continue to be strong. This year were pleased to be able to make a grant to the Essex CW Group to help them buy some equipment to expand and improve their CW Boot Camps. The committee is always open to requests for financial support for events that support CW in some way. Our thanks to our Treasurer Don, G3XTT for his hard and consistent work in keeping the books balanced.

Activity continues to be good despite the current poor HF Conditions and perhaps other distractions. Whether it be DX-ing, contesting or rag-chewing it is important we all continue to be active on the bands to demonstrate and encourage the art of CW at the highest level.

Let us remember that All CW is Good CW.

Please keep looking out for good CW operators who would make good members.

The Clubs social events are good opportunity to meet other members in person so please consider supporting an event in your area in the coming year.

The Club would not function without the efforts of many willing and committed volunteers. The organisers of the various dinners and meetings around the world, the FOCUS and News sheet editorial and distribution teams, organisers of the Marathon, Club awards, activity days, and QSO parties, our QSL manager and those running the web site and other web services. We would like thank all of them.

Finally, I would personally like to thank my fellow committee members and the President for their support, hard work and wise counsel.

In particular sincere thanks to Michael, G7VJR our very able Secretary who has asked to leave the committee after 3 years due to increasing commitments at work. Thanks also to Ray, G4FON who is leaving the Committee for reasons which will become apparent later. I am pleased to say we have volunteers to replace these all positions.

We also wish our President Andy, G3AB well in his forthcoming new work posting which sadly means he is resigning after only one year in office.

# Committee Secretary's Annual Report

**By Michael Wells, G7VJR**

This special weekend in Guildford is a moment where we can reflect on what has been done in the Committee. Each month, the Secretary's report has been sent by email after each Committee meeting so I hope that members feel well-connected with our deeds since last autumn's AGM at Cambridge.

Firstly, for both myself and Ray, G4FON this will be our last event as officers of the club, but I am sure that by the end of today you will be reassured by the way the changes will unfold.

The Committee must thank Gabor, S57WJ and Bob, WB2YQH as it's down to them that the FOC News Sheets and *FOCUS* have been running like clockwork and Marathon trophies are being looked after with great precision.

Both Gabor and Bob have received the club's Unsung Hero Award for being generous volunteers. However, as Gabor is now taking on many other commitments, he will be carrying on with the News Sheet but the editorship of *FOCUS* will need to pass to another member. We are looking for volunteers to help Gabor step down without delay, as he needs to do.

Wes, AC5K and Joe, DL4CF have been busy preparing an activity report to help the Committee get in touch with any members who are inactive. This is part of how FOC looks to avoid falling out of touch with members, and it takes a great deal of care to do this sensitively and well. The Committee's work on activity is made far more manageable by their efforts (and the help of IT experts who volunteer their time to help with this process). We're grateful for this help.

We have Committee member Pete, GØPNM to thank for a range of new merchandise on sale since 2018, which you can find in the FOC shop or on his web site. Pete is also now offering FOC badges, which will help us reduce quite significant postage overheads (especially in Europe and the UK). Additionally, after an extraordinary effort by Mike, WØVTT and thanks to the kindness of Summer, VE5SDH (SK), the Club has received a significant windfall which can be used to support the aims of the Club.

Membership numbers are in good shape. Tyler, N4TY looks after everything so professionally. Tyler provides the following report for the AGM, today:

*“Since the 2018 AGM, FOC has lost 3 Silent Keys, 8 to resignations, and 5 due to no correspondence, for a total loss of 16. Offsetting that, we have gained 14 members, resulting in a net loss of 2 over the year.*

Membership status		Membership by continent			
Full:	492	United Kingdom:	109	Asia:	13
Associate:	15	Europe:	123	Africa:	4
Honoured:	2	North America:	237	Oceania:	19
<b>Total:</b>	<b>509</b>	South America:	4		

*The past year has been relatively good to FOC: we only lost 3 members to SK, but lost 8 members who decided to resign rather than maintain activity worthy of sustaining FOC membership. The most difficult though is the 5 members that were removed from membership due to lack of correspondence. Committee has been thinking of ways to “buddy” members up with others, so that inactivity or disappearance would raise an alarm well before their subs were missed at the end of the year. We don’t have a solution, but for now we should all look out for each other.*

*Committee has asked that I require confirmation from sponsors of the two qualifying band QSOs within the last year, and I appreciate all sponsors for adhering to that requirement. Your continued attention to higher standards for incoming members is appreciated.*

*It has been my pleasure to serve you and the Committee again this past year. Please continue to nominate and sponsor worthy CW-active amateurs, especially if you have not done so this year, and do give careful consideration for possible members within the United Kingdom.*

*With all good wishes, I remain Cordially yours, Tyler Barnett N4TY, Membership Secretary”*

Finally, the Committee and I would like to thank Bruna and Roberto for supporting FOC’s event this year: FOC considers you, and Piero, to be true friends, and we gratefully acknowledge the craftsmanship and dedication you put into your CW paddles and keys. Thank you for being here with us this weekend as our special guests.

## **Award Presentations at the UK Annual Dinner**

**By James Dingwall, G4ILW**

The UK Annual Dinner and AGM was held on Saturday 21<sup>st</sup> September 2019 in Guildford. This was fully described in our News Sheet 840.

As promised in that News Sheet, here are the full speeches for the awards presented at this event. We can also now report on how some of these awards reached their recipients who could not be present that evening.

### **Honoured Member: Ted Trowell, G2HKU**

Our just elected President Ray, G4FON, read out the following citation for Ted, G2HKU.

“Honoured Membership is the highest honour the Club can bestow and is not given lightly, this being only the fourth award. Your Committee has decided this year to bestow this honour on member #293. This person has been a loyal club member continuously for over 69 years. He has been consistently active on all HF bands with a special interest in 160m.

He has received numerous RSGB, Royal Signals and RNARS Awards and he also received the prestigious RSGB ROTAB award as well as a special certificate from W1BB for the first Isle of Sheppey to USA contact.



He has always encouraged others and gave CW instruction for many years to the local Sheppey amateurs. As a young man he served his country well, working at the Sheerness Dock Yard and used his CW skills as a Volunteer Interceptor at home whilst also serving as a member of the Home Guard. More recently he has tried to stay active from his care home and made a few contacts despite the low power and low antenna and frightful RFI from the internet and care home computer. We are pleased to award Honoured Membership to Ted Trowell, G2HKU At 97 Ted was unable to join us so we asked Bill N4AR to accept the award on his behalf and convey our very best wishes to Ted”

Colin, G3VTT then had the honour of taking the FOC Honorary Member Award to Ted G2HKU in his Minster Isle of Sheppey care home during one of his Tuesday visits. Ted was delighted to receive the award and it was shown to the care nurses who were very impressed by it. It now stands opposite Teds bed close to his Morse keys and the IC-703. Although operation is difficult due to the electrical noise from the office router and the daily routines of the staff, Ted remains fully up to date on FOC matters. Weekly visits with conversations covering anything from radio conditions to World War Two vessels and Isle of Sheppey history to pre war receiver design make an interesting hour or so for Colin and Ted. Bill N4AR has also recently visited Ted and their meeting was the subject of a local newspaper article thanks to Ted's son in law who has a background in media.

*Write up and photo by Colin, G3VTT. - S57WJ, Ed.*

### **The G3FXB Memorial Award, 2019: Ellen White, W1YL**

President Ray, G4FON then proceeded at the AGM to read out this Citation for Ellen W1YL.

“It’s FOC’s great pleasure to present the 2019 G3FXB Award to Ellen White, W1YL - FOC Member #875.

No one better exemplifies the qualities reflected in the Al Slater, G3FXB Memorial Award than Ellen White, W1YL.”

Dave Summer, K1ZZ sent over his own tribute that was included in the speech:

*“I am very indebted to Ellen. She was instrumental in my getting my first summer job at ARRL Headquarters in 1968. The following year she was one of my sponsors for FOC membership. She was a principal organiser of Murphy's Marauders, a contest club to which I owe many lifelong friendships.*





*Throughout her 70-year career in amateur radio Ellen has been a limitless source of encouragement and an inspiring role model for generations of amateurs, especially those who share her passion for CW operation. The values she has imparted will continue to enrich amateur radio for decades to come."*

We congratulate Ellen on her life-long achievements: the First Class CW Operators' Club sends her our thanks, admiration and appreciation to her"

Since Ellen was not present at the Guildford AGM her award was later presented at the Florida Dinner in Orlando on 7<sup>th</sup> December 2019. Our membership secretary N4TY had the honour of handing Ellen her G3FXB plate during the banquet.

Ellen's story was printed in the National Contest Journal a few years ago: <<https://ncjweb.com/features/mayjun15feat.pdf> >

*Photo by George, K5KG. – S57WJ, Ed.*

### **The Unsung Hero Award, 2019: Bob Bagwell, G4HZV.**

The Unsung Hero Award is an award the Committee makes to a member who supports the club in the "background" and deserves formal recognition for their efforts. This year we were pleased to award the Unsung Hero to Bob, G4HZV. Bob has been the manager of the WAFOC and WAFOCC awards for many years.

He has also been our accounts examiner for some time. He has also organised the Friday dinner for the last two Guildford meetings and is himself a long-time supporter of FOC events. Bob was applauded as he came up to be presented with a superb Begali Signature paddle directly by Bruna Begali herself.



He has also been our accounts examiner for some time. He has also organised the Friday dinner for the last two Guildford meetings and is himself a long-time supporter of FOC events. Bob was applauded as he came up to be presented with a superb Begali Signature paddle directly by Bruna Begali herself.

*Photo by John, G4IRN- S57WJ, Ed.*

### **Focus 119 Errata:**

*I sincerely apologise for mistyping K2UV's callsign to W2UV, W2UW in the caption for the picture on the back cover. I also apologise to Eric, NM5M leaving him out of the caption in the picture on the back cover. The PDF version of Focus 119 was corrected.*

# A Homebrew Solid State HF/6m Amplifier Project-Part 2

By John DePrimo, K1JD

## Part 2: Design, Implementation and Testing a Solid State 1kW QSK Switch

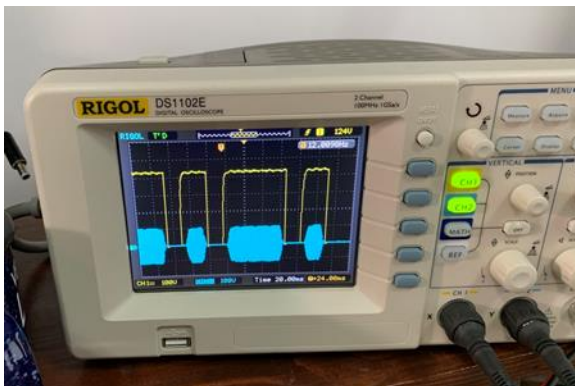
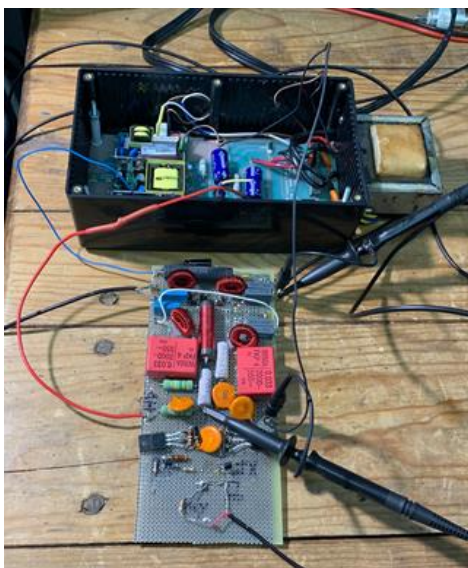
I had no intention of designing a QSK circuit from scratch. As it turned out, I used design elements from the Ameritron QSK-5 and Elecraft KPA500. The final design is essentially that of the KPA500 scaled for 1kW+ power output and with modified timing circuitry. Both QSK-5 and KPA500 use switching diodes with low voltage (5-6 or 12 Vdc) to control forward bias, and high voltage (450 Vdc) for the blocking bias.

After completing the prototype design schematic, I ordered the parts and decided to build it using perf board construction. Initial measurements of the QSK switching logic from Mid-December 2018 to early January 2019 looked promising.

The oscilloscope photograph was taken while running 100 W from the K3 through the switch. The amplifier input/output connections were replaced by a wire (i.e., a unity gain amplifier) for this initial testing. The RF waveform is contained safely within the T/R diode switching envelope – good news!

The same timing control signals for T/R switching are also useful for the LDMOS bias switching, so the decision was

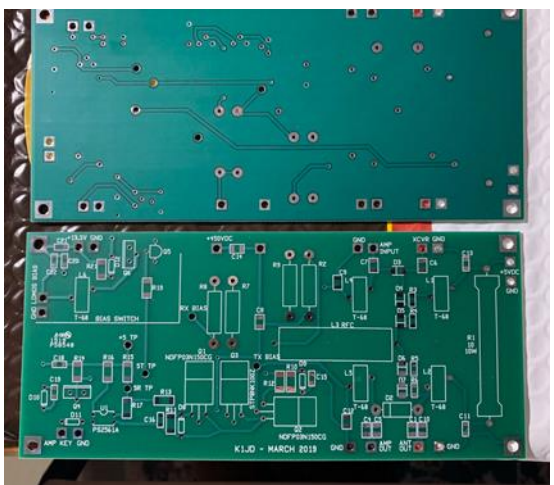
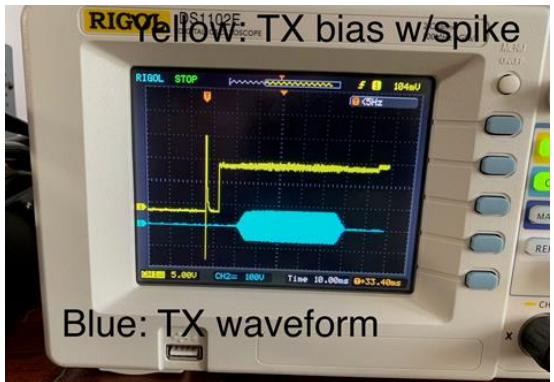
made to include the bias switch on the same board as the QSK switch. A 13 Vdc power supply was added plus additional circuitry to control its switching for the LDMOS device's bias. At this point in time, the +450 Vdc supply was cobbled together from parts scavenged from my old QSK-5 and the two lower voltage supplies were small switchers.



Preliminary testing for RFI from the switchers didn't reveal significant issues (spoiler alert – I didn't do a complete band scan in the preliminary testing!).

Encouraged by the satisfactory switching waveforms, the prototype QSK device/bias switch was interfaced with the RF components from Part 1 on 11<sup>st</sup> January 2019. By this time, multi-segment LEDs, a SWR bridge and a few other components to be used in the final implementation were added. Power was applied to everything, the power out of the K3 was turned down to zero and I sent a single dit. Everything had been going so well, I could not have anticipated that the single dit at 0 watts drive would have destroyed the LDMOS device, but it did. The old Doris Troy hit "Just one Look" from 1963, the year I got my Novice license, kept playing in my head as "Just one Dit". The culprit turned out to be large switching transients (some >15 Vdc) on the LDMOS bias waveform that created a gate-source overvoltage condition. These devices are rugged enough, but they do not tolerate this kind of voltage spike. Since the device is flow soldered onto the copper heat spreader, I sent the RF deck back to W6PQL for repair. His repair costs are very reasonable but added to the cost of a new LDMOS device comes to about \$250/failure! Avoid them if at all possible.

Now attention had to be directed at understanding the source of the large spike (yellow trace) on the switched bias and investigate ways to mitigate it. It was clear that the spike was somehow caused by the high voltage (450 Vdc) blocking bias switching within the QSK switch. About six weeks on and off were devoted to mitigation of the spike that were somewhat successful, but not wanting to destroy another LDMOS FET meant taking those efforts further. The decision was made to transition from the prototype QSK perf board to a proper printed circuit board (PCB) with a ground plane flooded on the bottom side. Many larger components could be changed to high voltage SMDs thereby reducing stray inductances.

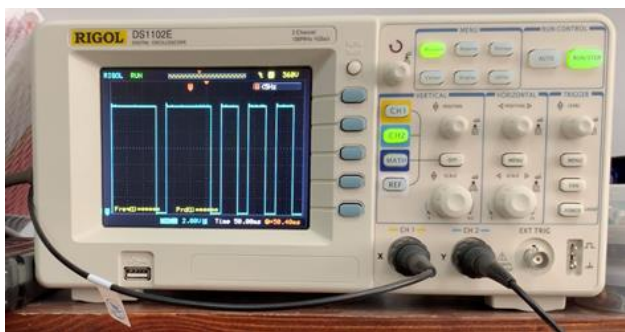


Jim, W8ZR has been using a program called *CIRCAD* by OmniGlyph to design PCBs for several decades and he loaned me the design software. The software package doesn't come with a primer to get you started nor is the user interface at all intuitive, so I had to impose on Jim to guide me. In all, about 25% of the time to complete the amplifier was devoted to learning and using OmniGlyph. One begins by drawing the schematic diagram with the tool. The tool then registers all of the connections and does its own internal error checks. Once the errors are cleared up, you then change to another part of the software package and create the PCB layout. By the beginning of April, I was ready to upload the PCB design (Gerber Files) to Advanced Circuits at <<https://4pcb.com>> located in Aurora, Colorado. When the boards arrived on 22<sup>nd</sup> April 2019, I was very impressed by the quality.



Populating the boards and through subsequent testing, I was relieved to find that the switched bias waveform was much cleaner (blue trace) with just a tiny overshoot on the leading edge; in fact, some of the components on the board could be eliminated or modified. The voltage spike problem on the switched LDMOS bias output – that took out a LDMOS FET - has been completely resolved by transitioning to the PCB implementation. Time well spent!

Before integrating with the LDMOS amplifier however, I hooked up the QSK "box" (board plus power supplies were installed in an aluminum Bud Box) to my Alpha 9500 to verify that the QSK PCB board could handle the power. The low voltage



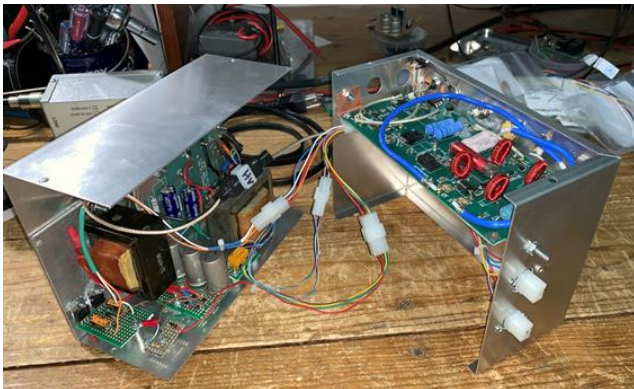
switched bias was not used of course, and the 9500's "amplifier key in" was shorted for the test. The QSK box was keyed by the K3 and performed perfectly running 1200w out. Several QSOs were made at this power level and the QSK was very smooth. Unfortunately, this is when I noticed some big frequency dependent RFI problems (I had not checked every part of the bands) with the switcher supplies, so I tore apart the original QSK aluminum bud box and built another using only linear supplies. The final configuration is shown in the next part of the article.



### Part 3: Electrical Integration of the QSK Switch with the Basic Amplifier

This part covers the electrical interfaces between the W6PQL amplifier components and the QSK box, revising the layout within the QSK box, and fabricating cable harnesses.

Preparing the QSK box for integration meant having to modify it to reduce/eliminate RFI either by using only linear DC supplies or finding quiet switchers. The former was selected as the best approach. The box was



also configured to come apart easier than its predecessor by partitioning the RF and power supplies on opposite sides and using Molex connectors to connect wiring harnesses together. The QSK board is mounted high on the right side and the 3 linear supplies are mounted lower on the left side. When the box is pushed together and closed, the ground plane on the bottom of the QSK board effectively separates them. Testing confirmed that there was no more RFI of any kind. This is the final QSK Box configuration that has been integrated with the amplifier.

Marrying the electronics in the QSK box to the W6PQL amplifier components is the main point of Part 3. Here are some of the decisions that were made:

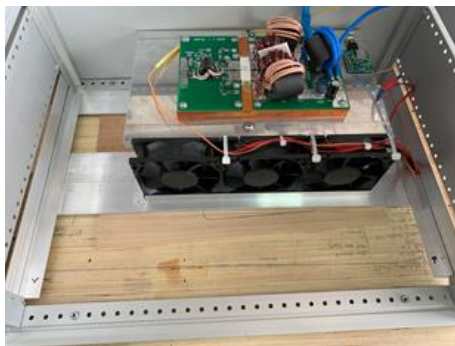
- The PQL input and output T/R relays, instead of being controlled by the PQL Control Board in a “semi-QSK” fashion when the control board is keyed, are latched closed by a front panel pushbutton switch selecting “operate” and released in “Bypass”. In Operate mode, the QSK box amp key line (not the control board amp key) is keyed and accomplishes the T/R function electronically and silently.
- The PQL control board controls the heatsink fans through a ground return. They are nominally off until the heatsink reaches about 110 degrees F and the ground return then turns on the fans. I wanted the fans to run continuously at low fan speed and kick into high speed when needed. A 15 ohm power resistor was wired in series with the fan return lines. A simple MOSFET circuit when turned on through the PQL control board fan return shorts out the 15 ohm resistor, running the fans at high speed and then returns to slow speed after the heat sink cools down. Perfect.
- The PQL control board responds to various signals such as high SWR, high temperature and other faults within the amplifier by disabling the “amp key” line within the control board; but wait, the amplifier key line does not run through the control board at all, it only keys the QSK switch! Fortunately, every fault detected by the control board is represented by a common signal going low to ground. I had connected the various sensors distributed throughout the amplifier to the control board, so I needed a way to use the protect circuits’ signal to ground. Instead of



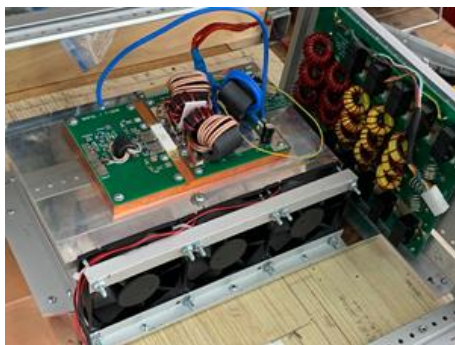
disrupting the control board key line, what if the fault signal going low opened the T/R relays and dropped the amplifier into “bypass”? This was indeed the answer and seems to work flawlessly. There were an extra set of relay contacts on the low power input T/ R relay, so I routed the “amplifier key in” signal through them as well. As soon as a fault is detected, the key in line is also disabled as the relays open. The photo shows the 2 MOSFETs for fan speed and fault handling installed on a perf board above the W6PQL control board in the front partition of the amplifier.

#### Part 4: Physical Layout, Enclosure and Panel Design

Early on, the expected contents of the amplifier enclosure were studied and enclosure product DII-87-4-13 from Buckeye Shapeform in OH was chosen, its 17”/15.8” width x 13”/12” depth x 8.7”/8.4” height external/Internal measurements seemed adequate. I thought that my choice would leave a generous amount of open space inside the cabinet, but that was not so: Good thing I didn’t try to go smaller. The cabinet arrived on 29 January 2019, around the same time the repaired RF deck arrived from W6PQL.



Along the way, I’d take some of the components from Parts 1-3 and fit them inside to get a better sense for what might be an optimal layout. One could not count on the lightweight aluminum bottom shell delivered with the cabinet to support the weight of the amplifier components, so I began reinforcing the bottom with angle aluminum and bar stock. This photo was taken on February 15<sup>th</sup> and shows the repaired RF deck/heat spreader again mounted on the heat sink along with the fans resting vertically against it and the blank back panel in place. The aluminum bud box on the left would house the QSK board (the perf board at this time) and the switcher power supplies that were later replaced. With that major portion of the cabinet occupied, the LPF seemed best installed vertically against the back of the right side. The fans were mounted using channel and angle aluminum stock. The way the layout was evolving, maybe the back volume of the cabinet could be dedicated to the RF components, a vertical partition installed in front of the fans with outside air coming from a rectangular hole in the bottom of the cabinet, and the resulting space in front for control-like components and front panel parts. This approach



was not a dead end, fortunately, and proved well suited to housing the rest of the amplifier. In this photo, the amplifier is essentially complete. The QSK box shown was replaced with the newer version using linear supplies. The partition behind the front panel has the control board, MOSFET custom circuitry and BCD boards attached to it on the front panel side. All of the front panel switches and component are ready to install. This brings us to the front and rear panel designs. The company “Front Panel Express” has been around for a long time and I had previously used them for a tiny custom panel that fit into a Pelican micro-case for one of my SOTA radios. Their design software isn’t particularly difficult to use, and so both front and rear panels were designed and submitted for them to manufacture. The layout on the computer screen was the information Front Panel Express used to make the black panel. Since all the front panel component harnesses had



been previously made, everything just needed to be placed in the proper mounting holes.

I had decided early on to not display information to a high degree of resolution, choosing instead to, at a glance, make sure the amplifier is operating within a “safe operating envelope”. The first red LED segment in each of the 10 segment displays, left to right, indicate 50 Vdc, 35 amps, 1 kW forward power and 100w reflected power.



The back panel was a little easier since it didn’t have to look “pretty”, just allow for the needed connections and for the heatsink exhaust air.

The amplifier has been essentially completed and in daily use for several weeks now. It’s a joy to use with its silky smooth QSK, power delivery at low drive levels, and auto-band switching with the K3.

# FOCers head to the Gambia

By Don Field, G3XTT

One consistent theme in this year's CQ WW CW Contest reports from around the UK was that contesters were erecting antennas in wind, horizontal rain and generally unpleasant conditions. I recall those days – arriving back at the QTH on GU after the pre-contest dinner to find all our carefully-erected antennas on the ground after high winds, cars being towed out of the field at GW8GT because the ground was so muddy after constant rain during the contest. And so on. Not for nothing have I, for many years now, headed to warmer climes for the autumn contests!

## Background

Alan G3XAQ and I are both veterans of DXpeditioning and contesting in West Africa. For reasons explained above, I went for several years with the Voodoo Contest Group to 9G, XT, 5U and 3X, for example. Alan and I were also on the C5X DXpedition in 2014 with Iain M0PCB and Steve G3VMW and both of us were back in the Gambia earlier in 2019, myself in March for the RSGB Commonwealth Contest (airing my brand new call sign C56DF) and Alan later in the year for what was essentially a reconnaissance trip but putting his well-worn C56XA call sign back on the air (both of us using the same QTH). We both agreed that the apartment we had rented had potential as a contest QTH for CQ WW CW in November, although not for a multi-band entry because the space for antennas was limited. The plus side, though, was that the rental apartment was well located for local facilities, offered a handy rooftop space for antennas for 40m and up, and was remarkably quiet in terms of electrical noise (often a major problem in Africa, where suppression of RF is hardly a major concern). And compared with, say, Ghana, and certainly with East Africa (Alan had done CQ WW CW from Uganda in 2018), the Gambia is much better located for the contest, being right on the Atlantic Coast with an excellent shot to the Americas in particular.

## Planning

So it was that we hatched a plot to run two single-band entries for CQ WW CW. Alan had left his two-element homebrew Moxon beam for 20m on his earlier trip, while I envisaged a 40m single-band entry. The 20m effort would be the greater challenge because the late Brian Coyne G4ODV had set a very respectable record as C5/G4ODV way back in 1990. There had been no single-band entry for 40m, so I would set one come what may!

Planning was relatively easy. We would each take our individual stations and all we really needed to do was to avoid unnecessary duplication of tools, test gear (antenna analyser) and the like. Our only 'eyeball' meeting was in Guildford at the FOC dinner. Finding suitable flights was probably the biggest challenge – thank goodness we didn't settle on Thomas Cook (who became insolvent just prior to our trip). In the event, we chose Brussels Airways and this proved to be a good idea – easy to book additional check-in baggage, a proper full-service airline and I could get a connecting flight to Brussels from Bristol (my nearest airport since our move of QTH) while Alan could fly from Heathrow.

## On Our Way

We allowed two weeks for the trip to ensure there was plenty of time to prepare thoroughly and overcome any problems that might arise. So it was that we met up at Brussels Airport Terminal T (a terminal dedicated to African flights) some 10 days before the contest. All went smoothly other than



**It beats putting up antennas in wind and rain!**

a slight hiccup at Banjul airport when each of us got stung for a “processing fee” to bring our gear into the country. We quickly settled into the apartment in the Gambia and put up our antennas (Alan’s Moxon and, for me, a 40m inverted-vee dipole). The flat roof was probably close to 50ft above the ground and we had a view (albeit at a distance of a few km) of the sea.

Alan’s Moxon was supported on a scaffold pole that he had sourced on his earlier visit. My 40m dipole went up at the other end of the roof, supported by a fibreglass pole. As for gear, our two stations were essentially identical – K3, KPA500, Winkey and N1MM+ for logging. We each had a bandpass filter in place (between rig and amp) for the two bands we planned to use in the contest.

## A Problem!

Everything fired up fine, but our initial tests indicated we had an unexpected problem – when I transmitted on 40m, Alan had an unacceptable level of noise on his 20m receive. This led to us running a sequence of tests to see whether the problem was with one of the K3 transceivers, the proximity of the antennas, confined to certain combinations of bands, or what. After all, one of the attractions of the K3 to contest and DXpedition groups is the lack of interactions – they are well known for having a clean spectrum. It was important to us to try to solve the problem if at all possible because our early listening suggested that there would be a few hours around dawn and dusk when we would both want to be QRV at the same time. Outside the contest it was unimportant – although we planned some casual operating, we were quite relaxed about only one of us being on at a time.

Quite early in our trip we invited Andre C5YK (ON7YK) to join us for lunch and he did so, along with his charming wife Lucy. They live a peripatetic life, spending the winter months in the Gambia, travelling by Land Rover around Europe in the summer months and the occasional foray elsewhere (they were recently back from a family visit to Australia, for example). Nice people and Andre readily agreed to pop round the following day with his KX3 to further help in our investigations. In the event, the power was out for most of that following day (more on this in a moment) so he came again a day later. To cut a long story short, what we managed to prove was that the problem was neither rig

(or equipment such as a PSU) nor antenna related. Our conclusion was that there was reradiation by “rusty bolt effect” from somewhere in the roof area. Probably not surprising given the amount of corroded rebar and other metalwork up there, but intensely irritating. We are, though, very grateful to Andre for his assistance in delving down into what was actually happening.

### Contingency Planning

Our take on the problem was that we would just have to live with the station interactions and plan our operating accordingly. Not ideal but Alan and I had no intention of coming to blows over the matter (even if we both found ourselves with open bands and multipliers screaming out to be worked!). The power outages, though, were a different matter. Our first few days in the Gambia had seen occasional outages of maybe 10 minutes or so, but by the second week we were seeing outages of several hours at a time. We simply couldn't risk this for the contest, so Alan went out to secure a suitable generator. We had been warned that trying to hire one was likely to be fraught with problems (it probably wouldn't work, for example) so the trick was to purchase a new one for the best possible price, with the intention of leaving it in the Gambia in secure storage for any future operation.



Don and Alan in front of the support for Don's dipole

In practice, Alan was able to buy a Chinese-made generator rated at 3kVA for around £120, which, divided between us, seemed like a good insurance policy. It wouldn't really allow us to use our linears but would at least keep us on the air during an outage. We were told by those in the know that such generators probably don't last more than a few months of regular use but, hey, we needed no more than a weekend at most!

We both made a number of QSOs prior to the contest, to give out the country and check how well things were working. Alan was particularly anxious to ensure his Moxon Yagi was working well, which indeed proved to be the case. I focused on 10 and 18MHz, where I made several hundred QSOs. And, of course, we relaxed, enjoyed the sunshine, the local food and beer and, as you'd expect, swapped war stories of our various radio activities from around the world.

### Contest Time

Come the contest, we were ready to go. I had a great first night on 40m and the band had pretty much faded out by the time 20m opened up and Alan started to put QSOs into



his own contest log. He tells me the only QRM he suffered during the day was my snoring from the adjacent bedroom!

Contests are contests and there's probably no need for a blow by blow account. Suffice to say that we both ended up reasonably happy with our respective scores although there is no way we could have competed with the Caribbean expeditions and others better located for European and North American QSOs. But it was fun. It was good to have a low noise QTH, given that many African locations are a real problem in that respect. And, guess what, we were able to go the whole contest with no power outages. Buying that generator obviously convinced Murphy that he would be wasting his time cutting off our mains power! Comparing notes after the contest (we barely spoke during it because one of other of us was operating the whole time), we both noted certain Caribbean and other



**Alan assembling his Moxon**

multipliers that were impossible to raise but I think we were both reasonably happy with the multiplier totals we ended up with. Alan appears to have comfortably beaten the previous C5 20m record (subject to adjudication, of course) while I believe I have set a 40m record that will stand for some years.

### **Reflections**

Was it worth it? Yes, these contests are always fun. We both managed to put a bunch of FOcCers in the log – apologies if we didn't always come back to you by name. It was great to escape the British winter weather (see my opening paragraph!) and, more importantly, the tedious election campaigning! Brussels Airways did us proud, with good on-time flights and successfully delivering our baggage in both directions (don't ask Alan about his experiences with Air Maroc earlier in the year!). And the Gambian QTH proved to be as good as we had hoped, albeit we wouldn't want to use it again for a two-station entry, given the unfortunate interaction problems. Despite some pre-trip correspondence with PURA (the licensing people) who had expressed an interest in a visit from us to explain more about amateur radio, they simply didn't get back to us with the promised list of topics to cover or a date to suit. Such is Africa. But at least we had showed willing.

If you need a QSL, mine is via my (new) home QTH (see qrz.com, etc) and Alan is via Phil G3SWH.

Till the next one!

# How Do We in FOC Address the Somewhat Complex Relation to FTx?

By Mats Strandberg, RM2D

Amateur Radio is by definition a hobby that always has stimulated and encouraged technical development and innovation. The hobby has evolved as a result of such innovation. Nothing is wrong with this, and we can all agree that the hobby probably has grown more colourful and richer as a result of such development.

The theme I decided to address here might be sensitive for some, and for others maybe the most natural thing of all to ventilate or debate. I sincerely do not have the intention to divide us into groups, or to criticize or blame. Just to share some of my very own personal thoughts and reflections about the relation between tradition and innovation – and how that ideally would influence us as FOC members.

We are all perfectly aware of that FOC is a club with very long and proud traditions of developing and keeping Morse code radio communication at the highest of levels. We have all been nominated into this club, by CW-enthusiasts, who wanted us to be good ambassadors for the most fundamental and traditional part of our hobby – Morse code wireless communication.

We have by accepting to become FOC members also promised to be active on this excellent fundamental mode, in order to make sure that we show the world how important CW is for our hobby. This is not exactly a duty or obligation, but rather something that we all should feel natural about - and to be proud of, without too much of pushing and demands. To operate CW as much as possible, and as frequently as possible, should be the most natural of things for this global group of 500 CW enthusiasts.

Something happened to this hobby a while back. A technical innovation, in the shape of a communication protocol suddenly appeared. Although being an innovation, the simplicity of using the new protocol or as we may call it, the new transmission mode, is so basic that even a child of a few years can learn to master it in a matter of an hour. No skills basically are needed, maybe except for the setup phase, when you need to know how to follow a detailed manual and set up the computer and connect it to the radio in a specific way. After that, the computers will talk mostly to each other, without very little or even any supervision or interaction from the human brain.

FT8 or similar modes, have made revolution in Amateur Radio, and no one can make that development be reversed. The mode is there to stay, whether we like it or not. The question is more how we as members of FOC should ideally act towards that new mode. Should FTx be banned in our rules of FOC, and result in disciplinary actions, in case someone started using it? Of course NOT!

But maybe we should take a step back and see what signals we give others, if we start spending a majority of our online time on FTx, and not on CW, which actually was the initial reason for us being selected into FOC as respected members.

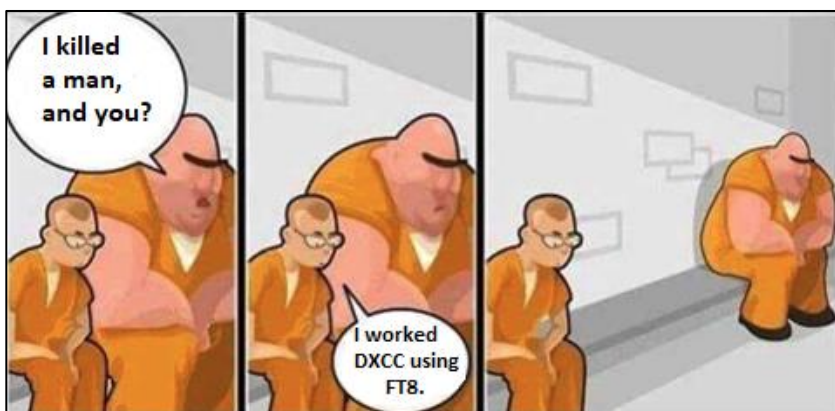
I personally have tested FTx a few years back, when the mode was introduced as something new and exciting. It was interesting for a while to try it out. I introduced it to

my 10 years old daughter, and while I was sitting next to her, she “worked” DXCC for me on FT8. It did not take long at all, and it did not require much of an effort for my daughter to do so either.

I noticed that during 2019, it has been significantly more difficult to find FOC members on the bands for daily contacts. In the Marathon, in special activities, FOC members still appear. However, during the periods in between events, the same old group of FOC members are hearable on the bands. At the same time, I keep some track of WSJT-X (software for FTx), and I am really quite surprised to see so many FOC members constantly on that mode. Why are they not on CW instead???

I even got a few spiteful comments from non-members, who said: Why are you not coming to FTx like so many other FOC members? Should I just shrug my shoulders and not care? Or should I ask myself and other FOC members, if the extensive spending of time on FTx is really compatible with the ideal way we as FOC operators should stimulate the Art of CW?

What do we want with our wonderful club? We want it to be active, to develop, to inspire others to be interested in joining us. This is not done while operating FT8 or FT4 Gentlemen. Come on! We are here because we love CW between human brains – and not because we like to sit and stare on two computers” talking to each other”!



## The FT8 revolution

By Roger Western, G3SXW

FT8/FT4 attracts a lot of media publicity these days and a lot, it seems, of HF operators. That, in my view, is not at all a problem. But if the point is reached where a FOC member stops using CW in favour of a digital mode then he might re-evaluate his membership. If it becomes his full-time activity but only temporarily then again I'd suggest that there's not a problem. But we do hear these days that some FOC members are working towards their magic 3,000 (or whatever level) DXCC points, while they denude the CW bands of activity. Members complain about CQing without reply: maybe these new digital modes are part of the reason.

The Constitution is specific: we are a CW club. So, CW should surely be the prime mode for all members.

# A Quick Thought About the FT8

By Steph Collas, F5NZY

I don't want to die as an ignoramus, a few weeks ago I installed WSJT-X and did a little listening which it didn't last long. I took a big shot behind the head, because I feel like I'm not in tune with my time at all.

To be honest, I absolutely do not understand the excitement generated by this mode. Everything is automatic! The software decodes, we click on the left window (it goes on the right window), we click at the bottom right to exchange a report and a locator, and before we know it, the "QSO" is logged. No exchange, no personal effort, but a friend told me that's why this mode satisfies its audience, and I agree with this analysis.

I have already voiced my opinion on a mailing list to which I am subscribed. An OM replied that Ham Radio operators were "Experimenters" and that therefore FT8 was very good! He added that I had to be a Ham Radio Amateur stuck in the past, similar to prior years when CW operators criticized SSB when it was a new mode.

I don't see how the operator experiments with anything, clicking on two buttons on the interface of a computer program to blacken a Log line. A program, moreover, of which he has no understanding of how it works. The writing of such software is indeed a great success of invested effort in its writing and development. But its exploitation by this kind by an OM of which I speak above, does not require any technical ability, and I suppose that everyone takes his pleasure as he can, and according to his faculties!

I noticed on the WSJT-X interface that there was a "DX-Pedition" mode, maybe it's not even necessary to click anymore, on these two buttons? (I didn't check). A true Experimenter is not a simple user who does not understand how his station works...

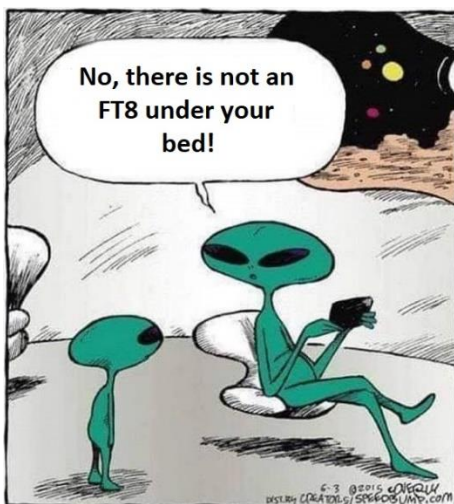
So, I will, like a Ham Radio Amateur of the past, continue to hang onto my keys, practice my dear Telegraphy, with my ears, and continue my traffic.

Another of my friends told me that there was something for everyone, to each his own. An argument that I understand and accept.

Finally, I was never interested in collecting awards for my operations. Only the pleasure I take in exchanging is important to me.

I note, and personally regret that the Club Log statistics of current DX expeditions show that there are now, more often than not, more stations contacted in FT8, than in CW and SSB combined.

Sad times...

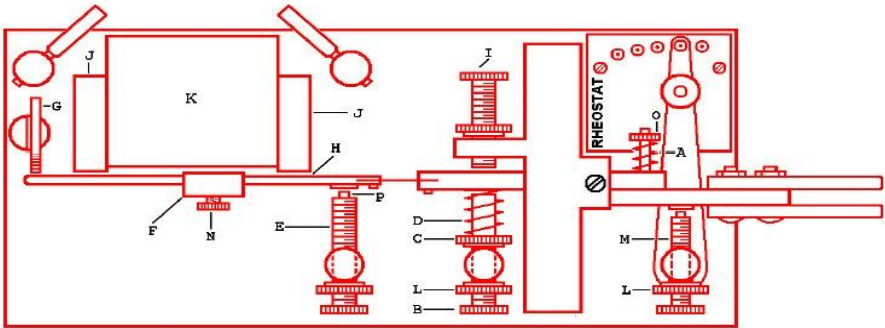


# The Electro Bug -Rebirth of a Particular Speed Key

By Fabio Bonucci, IKØXI

During a Sunday lunch at his home, Claudio IKØXCB told me about an Electro Bug he had from long time in his Keys collection. He had never been able to use it in genuine configuration because the bug was devised to work with a DC voltage applied to its two terminals. I was intrigued by this aspect and Claudio, who know my interest in electronics, gave me his Electro Bug to start some experiments aimed to make it work on a modern transceiver. I told him *"We can work it out!"* (The Beatles docet...).

The Electro Bug was made in Fresno, CA around 1927 by Electro Mfg. Co. Later the factory moved to San Francisco. The design includes the "T" bar handle. These bugs were made with a nickel-plated base and a black enamel base as well. There was also a model without an electromagnet called the Electro Jr. The Electro Bug is believed to be the father of the Les Logan line of keys as they had the "T" bar handle also. Searching for any kind of information about the Electro Bug, I found out that nobody today seems to use these keys connected to a radio transmitter and with a DC voltage supplied on. In fact, the Electro Bug can be also used as a normal bug key with no DC voltage supplied and all the videos I saw on web shows this way of use. I guess most of the Electro Bug owners never figured to connect a DC supplied key to a transceiver, duly concerned of the risk of damage. Just out of curiosity, Claudio and I wanted to know how this bug would have worked on air with a voltage applied and the electromagnet operating... To do this job safely I needed for the schematic, but on web I found pictures, some genuine instructions



- A – Dash tension spring
- B – Reed travel control
- C – Dot tension spring carrier
- D – Dot tension spring
- E – Dot screw
- F – Speed control weight
- G – Deadender wheel
- H – Air gap

- I – Reed adjusting screw
- J – Pole pieces
- K – Electro magnet
- L – Lock nuts
- M – Dash screw
- N – Weight screw
- O – Dash tension spring nut
- P – Dot contact plunger

Figure 1

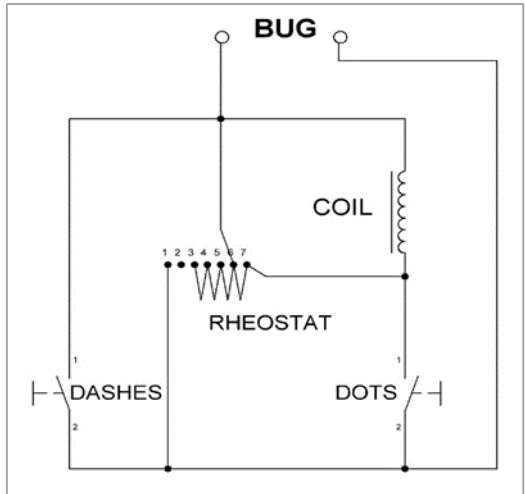


sheets with drawing (Figure 1.) and directions, but not a clean electric schematic of this bug.

So, I took pen and paper to draw myself the schematic I needed to design a possible solution to the voltage supply problem. In Figure 2. you can see the electric schematic I drawn.

**How does it work?**

The Electro Bug has an electromagnet (coil) which helps, not causes, the lever to vibrate. More exactly, when the Dot paddle is pressed the lever moves to the left closing the Dot contact. It happens as on any normal bug key, but here the Dot contact also energizes the coil and the electromagnet attracts the lever to the right. This lever movement causes the re-opening of the Dot contact, so the Coil turn off and the lever goes again on left due to the lever spring restoring force.



**Figure 2**

Here the Dot contact closes again and the Coil is re-energized and the lever back to the right....this *"Dot repeating cycle"* continues to the infinite (!) or, more simply, until the Dot paddle remains pressed. Under an electrical point of view, this circuit is a "vibrator" and the particular feature of this bug consists of the exclusive *"electrically assisted"* Dots repeating cycle just described. The electromagnet helps the lever "pendulum" movement by making it an infinite cycle, an interesting interaction between the traditional and well-know principle of pendulum and the added electromagnetic force. As for any other bug, in the Electro Bug the speed of the Dots is dependent upon the weigh(t)s position, as well any other mechanical adjustment is similar to any bug key. The difference lies in the elecromagnetic force which helps the lever on its movement to the right where traditional bug keys does not act. I wonder why a Dots cycle should be infinite (!) but for sure the electromagnetic force in the Electro Bug is the same for any single dot and the dots are all the same. This is the only reason why the Electro Bug is really interesting to try out. Why at Electro Mfg. Co. they invented this system?

As I wrote, this bug has an exclusive infinite Dot repeating system, all Dots are the same and according to the ads, *"the adjustable coil was capable to work perfect locals, low voltage duplex locals and average conditions of Railroad wires"*. Given the brief life of these bugs on market, I guess any other traditional bug did the same (or better) job. So I suppose that the Electro Bug was a innovative and interesting attempt to improve something no need to be improved... An experiment? Maybe. Anyway it remains a nice piece of bug history, handsome back in the day and also today.

## Let's supply the bug!

To work in this way the Electro Bug needs to be fed by a DC voltage, once drawn from telegraph lines. The coil is in series with the telegraph line and there is a 7 positions switchable rheostat which was devised as "magnetic force regulator" to adapt this bug to any telegraph line voltage. It's wired in parallel with the coil (it's a shunt). The 7 positions are as follows:

- Circuit Closer
- Open shunt, all current flowing through the coil
- 66 % through the coil
- 50 % through the coil
- 33 % through the coil
- 20 % through the coil
- Coil shorted out (Normal bug operating)

The first position of the rheostat is the so called "*circuit closer*", the second one is no shunt at all, 3 to 6 are Line voltage adjustments (coil partial shunt). On position 7 the coil is shorted out and the Electro Bug works a Jr. model (simple bug, no coil).

To start my job I've had to face the first issue: to feed the coil to move the lever properly both sides and electrically assisted. Pay attention to the Dash contact on schematic: it shorts the bug terminals, so any DC voltage must to be fed trough a resistor to limit the current to a reasonable level. The 15 ohm - 5W resistor in Figure 3 act as current limiter when Dash knob is pressed and the current is limited to about 500 mA at 8 VDC. This was the easiest job. But the core of the bug is the electromagnet... The coil DC resistance is about 90 ohms but it's partially shunted by the rheostat (except at positions #2 and 7#): feeding the bug at 8 VDC and acting on the rheostat I found out that the current level starting about 70 mA at 4.0 VDC on coil to about 200mA at 6.5V. Under 4.0V the electromagnet doesn't work. The safest rheostat positions (less current in the coil) are #5 and #6. Anyway the 15 ohms resistor, being in series with the DC voltage, assures a safe working voltage to the coil also when the Dot paddle is pressed, whatever is the rheostat position (3-4-5-6). Its value was chosen mainly to satisfy this requirement. Once built a little 8VDC regulator and made some adjustment, the Electro Bug started to work as first day!

Adjustments are the same as for any bug. The Air Gap (H) need to be properly regulated to assure a perfect electromagnetic attraction.

The 8V regulator is not 100% necessary, but it allows a safe current on Dash contact, a proper coil feeding and it avoid any dangerous supply voltage that could burns the precious old coil. Although the circuit allows up to 12 VDC input, I suggest a 9 VDC source to limit the power dissipation (heating) on the 7808 due to voltage drop on the regulator.

### A modern interface

As we know, the Electro Bug cannot be simply DC fed and connected to a modern transceiver, otherwise this article doesn't make any sense. Considering the needs of a modern transceiver, when a Morse key is pressed down it act as a short to ground: in the case of the Electro Bug we must to supply DC to its two terminals, meanwhile we need to ground them to manipulate our transmitter. These are two conflicting requirements, so we need something acting as

interface between this particular bug and the radio itself, something to do the two things at the same time. So we need to built more of a DC regulator and the goal is to do this job as easy as possible with no mods on the old Electro Bug. To solve this issue I designed a simple electronic keying circuit similar to the one I use in my QRP transceivers. The circuit is made by two transistors, one SSR (Solid State Relay) and few components. See Figure 4. for the complete schematic.

### Electronics matters!

When the Electro Bug is not operating the PNP transistor BC558 is normally open. When one press either dashes knob or dots paddle, the base of the PNP transistor BC558 goes down to ground (dashes) or almost ground (dots) by the 1N4148 diode, the transistor turns ON and its collector became positive.

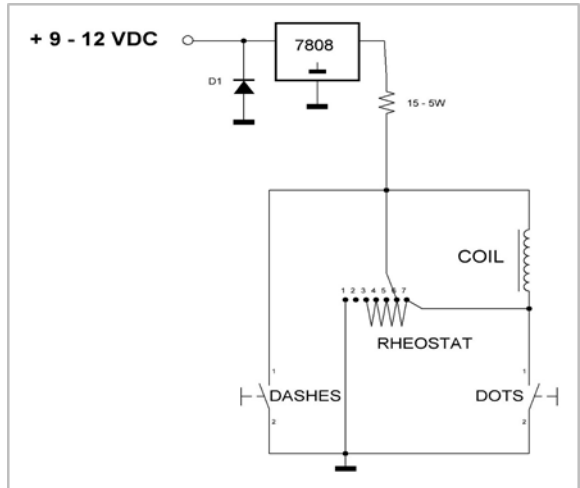


Figure 3

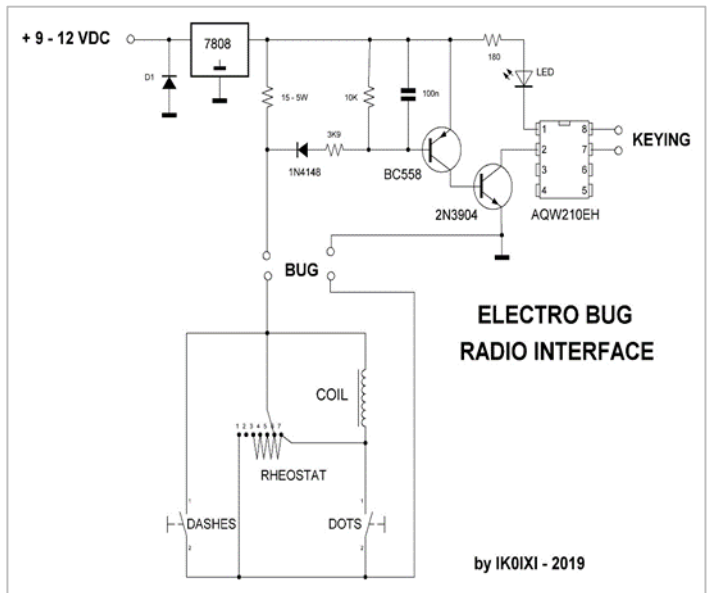
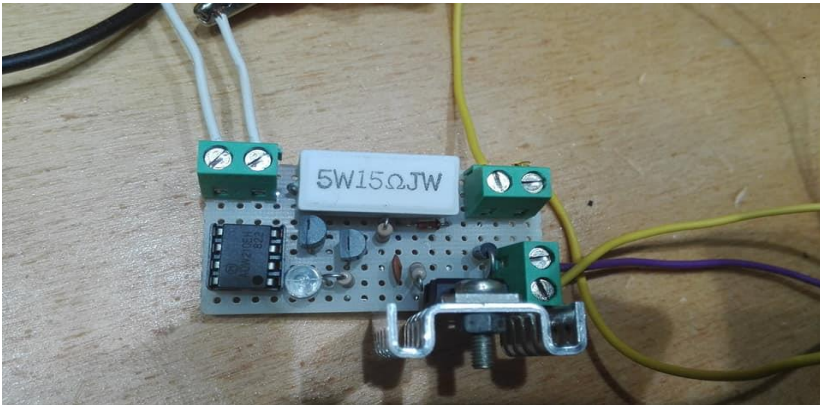


Figure 4

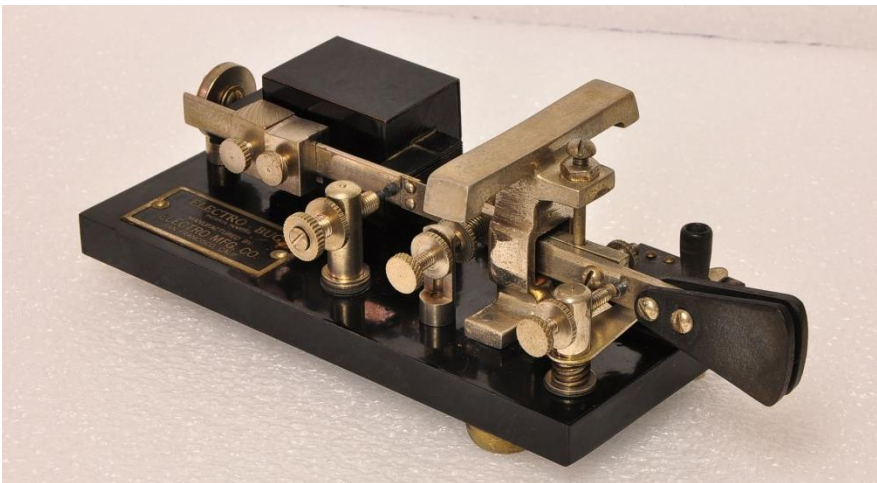
Now also the base of the NPN transistor 2N3904 goes ON, it turns ON and its collector goes to ground. Now the Solid State Relay pin 2 is at ground potential, the LED is ON. Also, the Transmitter is emitting due to the Pin 8 (Out) grounding. This happens for any Dash or Dot we send, as for any other traditional bug. So we solved the problem to feed and interface this old and particular bug to the modern world. A real rebirth, don't you?

The electronic circuit is made on a small solderable breadboard to which you need to supply 9 VDC, connect the bug terminals and the transmitter you want to operate. The solid-state relay allows either positive and negative keying, so this interface can be used both with modern or vintage (tubes) transmitters. Next step will be to house the board in a little box.

Now this old Electro Bug is ready to work properly with any radio. Have fun!



A video of the Electro Bug operating with my transceiver is available on YouTube: <https://www.youtube.com/watch?v=48QSy234Jv8>



# Suggested Methods for Increasing Your CW Speed

By Jim Danehy, W9VNE

I commenced my learning CW in 1950 when I was 12 years old. I qualified for my FCC Novice License in 1952 before I started High School. After almost 70 years I can reflect on several methods of increasing my CW speed. My first comment is that speed comes after you stop thinking of what was just sent. That is important. It takes time to think. You want to establish a reflexive mode. At first glance you might not understand my intent. Speed and time are interconnected. To decrease something (thought) you will automatically increase your decoding speed. That is a rational observation for me. You should be able to follow that concept. It will evolve for you. It did for me. At 12 years old I had little life experiences. I eventually pursued my Academics to earn a degree in Finance and Business Economics and then a Juris Doctorate degree. I became involved over a 50 year career in International Financing involving Insurance matters. I retired at age 70.

Learning is a personal process. They do not tell you that. I always wanted to be able to increase my code speed. At first it was a matter of survival. I had to increase my speed from 5 wpm as a Novice licensee to 13 wpm or go off the air. There was no renewal of the one year term of the Novice license. I am competitive. I wanted to excel at CW. I was drawn to contesting at an early age. My mentor was W9IOP (SK) who was a renowned contester. He was also an FOC member.

Another mentor was W9VW (SK) also an FOC member. Hal introduced me to using a keyboard in the 1970s. It was just a novel experience for both of us. There was no goal in mind. I did hang around the low end of Forty Meters. There were many QRQ CW operators there. They all were much faster than I was. Well it seemed that way. W9TO was the leader of that group. Jim developed that group into a quasi-club status. They adopted the acronym CFO. Do those initials look familiar? Well the full name was: Chicken Fat Operators. Many FOC friends of mine were also CFO members. That group carried on some excellent rag chewing on keyboards. Most of the sending was on a keyboard. The speeds were usually between 40 and 50 wpm. I have not used a keyboard in decades. My receiving speed exceeds my sending speed by a lot. I use various paddles but I do not send above 40 wpm. I make too many errors above that speed. Conversations with the CFO gang centered around increasing your CW speed. The use of keyboards was almost 100 percent. I was asked after a few months how my speed was developing. I reflected upon that question. I got some interesting thoughts. My opinion was reflected with many with whom I was ragchewing. My speed had taken a very noticeable increase. That was a universal opinion within the CFO folks too.

Now that is important. I have never studied the mechanics of thought and reflex. I did read a book by a well thought of psychologist that added to my reasoning that the keyboard helped increased my speed. His book was titled: Thinking Fast and Slow. He



held the opinion that there are two speeds in our brain. The fast one is reflexive. When you are placed in an emergency you survive better if your brain is in reflexive mode. If you have to stop and reflect you are wasting time. Time equates to safety in an emergency. Reflex have there place. So, does thought. But not in seeking an increase of decoding. The senses play a large part in that increase. When you listen to CW and decode it you are just using your hearing. When you are sending CW on a keyboard you hear what you are sending but you are also using your sense of touch. You know in advance what you are going to type before it is send. You then hear what you are sending. Knowing what it sounds like increases your sensory perceptions of the CW.

I found another way to increase my speed without being on the air. Well that is not novel. However, getting unlimited speeds is the feature. The ARRL has a link <<http://www.arrl.org/40-wpm-code-archive>> which has a lot of material. You can listen to MP3 audio files. Each file also has a matching companion text file. So, you can read what you are hearing from the MP3 audio file. Some might think that is cheating. Well it is an aid to increasing your speed. It is easier to increase your speed if you know in advance what the word is going to sound like. Note the emphasis on *word*. We are no longer copying letters. I once gave a small group a demonstration of how to copy at 50 wpm. Everyone admitted that they could not copy at that speed. So, I took a memory keyer and programmed in about 10 words. The 5<sup>th</sup> word I typed was Mississippi. I played back the memory keyer at 50 wpm. I then asked them to listen closely again. Then everyone admitted that about half way through there was a very distinctive sound (Mississippi). I now had my audience interested.

You are now adding another sense to the equation of hearing and touch. You are adding sight. So, I went from just one sense to three senses. I am a Lawyer not a Physician. But I know that the more senses that are involved in memory the more efficient and effective your memory will be.

There is an application that you can use to increase the speed above 40 wpm. It is <<https://lcwo.net/text2cw>> which you will find helpful to produce your own file above 40 wpm. I use the test file from the ARRL archive and copy it with a cut and paste process. I do just a few sentences of text and paste them into the blank spot on the app for creating your own text. You can adjust the speed to whatever you want.

Fabian, DJ1YFK has created a program for making your own MP3 files from available text. It is well explained in this YouTube video by KW4JM.  
<<https://www.youtube.com/watch?v=rrnpevU6xYc>>

All of the above was a journey for me. A long one too. From hearing CW with my ears to feeling CW with my typing to reading CW with my eyes. It worked for me. It was an evolution. Slower than I wanted but it got the job done. Many sports have a standard for doing something that matched your age. For a number of decades, I could state that my copying speed exceeded my age. My last Birthday was number 81. I can no longer state that brag.

Good luck with your exploration of my method. Feel free to correspond with me if you have a question or a suggestion.

# The VP6R DXpedition-From a Rookie's Point of View

By Mike Cizek, WØVTT

Most DXers probably dream about going on a DXpedition some day. I know I did, but never thought I'd get the chance to actually do it. For me, the next best thing was going to Dayton and the DX conventions where I could rub elbows with the "Big Boys" who go to all of these strange far away places. I enjoyed getting to know a number of the guys who went to top ten countries, and really enjoyed the rare occasion when one would call me by name in a big pile up. After chasing DX for 30 years, I was content with my place in the DX game and had stopped thinking about ever operating from someplace rare or exotic.

Receiving an email from Ralph Fedor KØIR in September of 2018 inviting me to the VP6R team was quite a shock. Ralph explained that he wanted to do a trip to someplace fun with a team that combined some seasoned DXpeditioners with some new folks like me. I emailed back immediately expressing my thanks, but also expressing my doubt that the plan would be approved by the family comptroller. The shock from receiving Ralph's email was nothing compared to my wife giving her blessing to the trip: "I think you should go." After a few emails and phone calls, I was added to the team. Learning who the other team members were impressed me to no end. These were the guys I had worked from all over the world; the guys I looked up to and respected. Now I was going to go out to play radio with them. The experienced team members were mainly from the previous year's 3YØZ operation and they wanted to go some place a little nicer than Bouvet. Almost every email Ralph sent out ended with "...let's have some fun", and that became the motto of our DXpedition. Our team email reflector was named "No-Ice Island". The wheels were turning...

We were soon trading planning messages on our team email reflector. I always knew there was a lot of preparation required, but for the first time was getting an inside look at the details. I had little or no experience in most of the requisite subject areas, but found one place where I felt able to contribute: fund raising. I know how to type and send emails so with a little direction from Ralph, I took on this task.

Other team members contributed in their areas of expertise. KØIR kept contact with the folks on Pitcairn, Nigel Jolly of the RV Braveheart, the licensing authorities in New Zealand, and kept tabs on the rest of us. Craig K9CT took care of assembling, testing, and networking the radios, computers, and amplifiers. He was also our treasurer and QSL manager. George N4GRN runs a construction company and knows about international shipping and customs. He handled this area and calculated that we would need to have all of our gear ready and packed in a sea container by 1 June. We all had plenty to do, and it was still over a year before we would leave. I kept typing emails and sending them to every DX club I could find.

Most of our equipment was from the 3YØZ operation. It was still packed in the sea container from Bouvet and was sitting in K9CT's company parking lot in Peoria IL. Some of the team gathered there in December 2018 to do a quick inventory and a few of us

went in March 2019 to assemble and test the EME antennas. The weekend before Dayton most of the US team members assembled in Peoria to load the container. Our task was to unload the 40 foot container from the Bouvet trip, do a complete inventory and assessment of everything, decide what we needed to take to Pitcairn, and pack it properly in a 20 foot container. We also needed a comprehensive itemized listing of what equipment was in each box in the container. Two days later we were finished. George almost wore out his laptop typing in every item as we packed and loaded it. The container was sealed and would be picked up in a few days to begin its journey. More than a few cold 807s were hoisted in celebration that evening. I was getting my first taste of DXpedition team fellowship. This is going to be a fun trip.



**Container loading**

All of our equipment was on its way, but we still had plenty to do in preparation. Ralph was still finalizing details of our stay on the island and trying to get permission to operate 60 meters; a first from VP6. He found amazing accommodations for us; one of the islanders agreed to house and feed us for a very reasonable fee. Check out Pitcairn on Google maps, look for Andy's Pizzeria, and you can see where we stayed. Look at the terrain view and you can see our take off angle to NA, EU (both NE) and JA (NNW). It was an amazing site. We also received permission to operate from the old commercial radio station ZBP, just a short walk from Andy's house. We would be operating from what were probably the best two locations on the island. Glenn WØGJ was coordinating our travel and lodgings en route. We were getting close to departure.

There were a few changes to the team during the year from initial planning to departure due to work, family, or medical issues. Real life has a nasty habit of interfering with our ham radio plans. The real shock came just a few days before our departure when our team leader KØIR told us he had a medical issue and would not be able to go with us. Ralph immediately named Glenn WØGJ our new team leader. Glenn picked up the reins, kept us moving ahead, and we hardly missed a beat. Our final team was now EA3HSO, EY8MM, JR4OZR, KØPC, K9CT, K9NW, N4GRN, N6HC, SM5AQD, WØGJ, WØVTT, W6IZT and W8HC. It was time to go.

Did I mention that this was my first DXpedition? I'm not a seasoned traveler and was more than a little nervous about the trip. Fortunately, I had company every step of the way. On Saturday afternoon 12 October, WØGJ and I met in Rochester MN to take the shuttle bus to the Minneapolis airport. There we met KØPC and K9CT; the four of us would all be on the same flight to Los Angeles. In LA, we met most of the rest of the team and were all on the same flight to Tahiti. We landed early Sunday morning and

walked across the street to the Tahiti Airport Motel where we met the remaining two team members. JR4OZR and SM5AQD were waiting for us in the motel lobby. Since there is only one flight a week from Tahiti to the Gambier Islands where we meet the Braveheart, we allowed an extra day, just in case there were any delays. We now had an extra day to play tourist in Tahiti and everyone headed in to town for the day.

Glenn called a team meeting for Monday morning at the motel so we could discuss our arrival and set up plans. He stressed the need to get set up quickly since we were arriving on Thursday morning and there was a large rain storm forecast for the weekend. Tuesday morning we left Tahiti on the four hour flight to Totegegie in the Gambier Islands. After landing at the *very* small airport (one gate, one plane), we took a short ferry boat ride to Mangareva Island where we boarded the Braveheart.



**RV Braveheart**

The legendary RV Braveheart! This ship had been there and done that, all over the southern hemisphere. I had seen the pictures and read & heard the stories, and now I was finally getting a chance to board her. Matthew Jolly, the captain, welcomed us aboard. He knew many of the team members from their earlier voyages with him; the greetings were warm and heartfelt. Matt introduced us to the crew, and to his wife Rachel and their son Finn, who were along for the ride. Three year-old Finn wasn't quite sure about these crazy ham operators at first, but he finally decided we were OK. I asked him if he was going to be the next captain of the Braveheart, and he very confidently said no, he was going to be four. After a quick safety briefing, plates of sandwiches from the galley appeared and we had a nice mid-afternoon snack. A short time later, we cast off and were underway. I spent a while exploring the ship, then settled down on one of the upper decks to enjoy the view and the fresh sea air.



**Underway**

We arrived off of Pitcairn Island early Thursday morning and sat off shore waiting for the islanders to come out in one of their longboats to bring us to shore. We were all pretty excited now and eager to get ashore and get started. We were very fortunate that

because of the Braveheart's schedule with other charters, our equipment had been placed on to the island a month earlier. All of our radio gear was there waiting for us. After a short welcome at the dock on Bounty Bay, some of the islanders loaded us on to their ATVs and we headed up the "Hill of Difficulty" to Andy's house.

Once we all arrived at Andy's house, station setup started directly. We had our plan, formulated in our Monday morning meeting, and everyone got right to work. Once again, I was impressed at how quickly things happened. Everybody seemed to know what they were doing and by supper time, we had set up five Yagis for 10-20m, two verticals for 30 and 40m, and four complete, networked stations. K9CT made our first QSO on 30m CW with N7XM at 0200z (6pm local time). VP6R was on the air.



**On the air**

The next day we set up our low band antennas at ZBP, the old commercial radio station site. Our main project was erecting a 90 foot (27m) tall vertical for 160 meters; 70' of aluminum tower with 20 foot of mast tubing and top loading wires. This required the entire team working together.

The antenna is mounted on a hinged base and we used a 40' falling derrick to raise it. The biggest folks handled the pull up ropes and pushed up the tower; the rest of us held the guy ropes to guide it up straight; WØGJ directed everyone, telling us when to pull or when to let up. The antenna went up in just a few minutes.



**The 160m vertical on the ground**

We also installed verticals for 30, 40 & 80 meters and a second 20m Yagi. That first night on 160 meters Nodir EY8MM made over 700 contacts. He came back to Andy's house shortly after sunrise with a big smile on his face, and promptly went to sleep.

A number of people had told me "you won't believe the pileups" on the DXpedition. I've been a DXer for 30 years and have been in plenty of big pileups, but never from the DX side. I had been practicing from home mostly by listening in the big pileups on other DX stations and picking out callsigns, and thought I was ready. I wasn't! I like to think I'm a pretty good CW operator, but the pileups on the first few days were just too much for me. I retreated to FT8 and let the more experienced ops handle CW. After a few days, things slowed down a bit and I was able to do better. I now have an even greater

respect for the ops who have the ability to pick out callsigns quickly and consistently in these huge pileups.

Once I got going, operating from the DX side was a real blast. It was nice to get a good rhythm of steady QSOs going and especially rewarding to work friends from around the world and call them by name in the pileups. It was fascinating to experience propagation from another part of the world. Naturally, we had propagation predictions and most of the team had operated from the south Pacific before, but there were still plenty of surprises. 30 meters was open all over the world most of the night. We would often work all continents within a five minute period. We had a regular path on 10 and 12 meters to CT, CN, D4, EA, and EA8 for a few hours almost every day. Sometimes these signals were surprisingly loud.

The most interesting opening I experienced was on 12 meters one morning. I was calling CQ on what appeared to be an empty band. Around 1730z (0930 local) I heard a very weak and watery SM2 station. I worked him and was called by a second SM2. The opening spread into OH and southern SM, but not into LA or UA. A little later some North Americans appeared, then some stations from southern EU, then more and more USA until at 1800z the Europeans had disappeared completely. This one wasn't on our propagation prediction charts!

Remember the storm that was forecast for the weekend? It rained sideways for four whole days with wind gusts up to 50 mph. We were pleasantly surprised that our 160m vertical survived, but we lost both 20m beams and an element off of the 15m beam. Fortunately, only a few pieces of tubing were bent and we had spares. Once the storm had passed we had everything repaired and back in the air in short order. Once again, it was amazing how quickly and efficiently the team worked together.

VP6R was a multi-multi entrant in the CQ WW SSB contest. We shut down our N1MM DXpedition mode logs a few hours before the contest and were ready to start in contest mode right at 0000z. Since I'm mainly a CW DXer, I asked to do 10 meters during the contest. I thought it would be interesting just to see what propagation we would have over the course of the contest. The contest started at 1600 local time and 10m was pretty slow at first. After only three QSOs in the first hour, the band finally opened up with a nice JA run that lasted almost two hours. I was up bright and early Saturday morning calling CQ, but the band didn't open until 1600z (0800 local). We had a strong opening into Zone 33 and I got a good start on my "Worked All EA8" award. I had no idea there were so many stations in the Canary Islands! After a handful of Zone 33, it was all North & South America, all day long, until around 0000z when the opening shifted to JA. It was almost like someone throwing a switch; propagation changed that quickly. By the end of the contest, we had 1050 QSOs on ten meters. I never had so much fun operating sideband before! The final numbers haven't been published yet, but I'm pretty sure we took first place for multi-multi in VP6.

All too soon it was time to put our toys away and go home. We took down the low band site on Thursday 31<sup>st</sup> October. Our last QSO was with Jerry WB9Z our chief pilot station on 17m SSB at 1800z on Friday 1<sup>st</sup> November, after which we took down the antennas at Andy's house. Everything was packed up and ready to go by lunch time that



day. Once again, we had allowed extra time, just in case, but everything went very quickly. We now had some time to play tourist and do a few good deeds for some of the local hams.

We helped Meralda, VP6MW and Mike VP6AZ get back on the air by providing antenna parts, supplies, and some technical assistance. Meralda was already active before we left the island, and let's hope that Mike is on soon. I was especially happy to help Meralda because she was my very first Pitcairn Island QSO back in 1989.

This trip would not have been possible without a lot of help from a lot of people. First and foremost, thanks to ACOM, DX Engineering, and Flex Radio. These three companies were VERY generous with their support. We also had other corporate sponsors, 38 different DX clubs and, hundreds of individual DXers who helped us out. Thanks to all of you on behalf of the entire VP6R team.



**Meralda, VP6MW**

No DXpedition report would be complete without some numbers. We made over 82,000 QSOs on all bands 160 through 6 meters. We were pleased to have 21% of our QSOs come from Europe, a very difficult path from the South Pacific. For me personally it was especially gratifying to work 67 different FOC members on 10-40 meters (I never operated 80 or 160). We were also happy to make nearly 900 QSOs on 60 meters and 36 EME QSOs on 6 meters; both of these were firsts from Pitcairn. For a complete analysis of our operation please see the statistics page on our Clublog DXpedition Chart.

The trip back home was remarkably similar to the trip out to Pitcairn, but with greatly different feelings. Going out was filled with anticipation, excitement, and more than a little trepidation; I really didn't know what to expect. Going home was mostly gratitude for having such a wonderful experience. There was also a bit of regret at having to leave such a beautiful place, but it was mixed with the desire to return home and resume my "normal" life. This was truly a once in a lifetime experience for me. It was wonderful to visit a strange far away corner of the world, to meet new people, and to finally experience the radio conditions on the "other" side of the pileups.

The travel and radio experiences were wonderful, but for me the most rewarding aspect of the trip was experiencing the wonderful fellowship among our team members. Being a part of this team was an honor and a pleasure I will remember for the rest of my days. From the very beginning of planning, KOIR kept saying "let's have some fun", and that's exactly what we did. We hope you had fun, too.

*All photos in this article were made by Nodir, EY8MM.-S57WJ, Ed.*

# Who Said, "Morse Code is dead..."

By Andy Kersey, GØIBN

You would not say that if you were on the bands on the weekend of 23rd and 24th November, 2019.

The American Radio Relay League (ARRL) have their annual worldwide morse contest around this time every year and participants travel the globe to find an unusual place to operate either on their own or as a team of enthusiasts.

I am not a "serious" contester, but I do enjoy participating. In the past I have been 1<sup>st</sup> in England a few times and 2<sup>nd</sup> in Great Britain in my category, which is to operate on one band, normally 20m, as a single operator, with a low power of 100 watts.

The duration of the contest is 48 hours, but I normally operate only 12 hours. With 20m normally open in daylight hours I manage to get a good night's sleep!

There is no way I can compete with the big boys with their kilowatts of power and enormous aerial arrays. I live in a semi-detached house on an estate, so I am always aware of keeping my neighbours happy!

My aerials consist of a G7FEK which is designed for a small garden - my garden is only 10m long. The G7FEK evolved from a simple end fed aerial for 80m. It is only 46ft long x 24ft high with a 50 ohm coaxial feed. Although it is classed as "multi-band," 80/40/20/15m, I only use it on 40 and 80m. With an SWR of 1:1 on 80m it works very well, for 40m I do use an ATU. With its low angle of radiation it has made a contact with Australia on 80m, quite an achievement for my small QTH. It is not too intrusive to the eye and easy to make. Regarding the 46ft length in my 10ft garden?! It does go over my roof, you can see it on my QRZ.COM page.

On top of my 40ft Tenna mast I have an MQ-26, a six-band hybrid quad antenna for 20,17,15,12,10 and 6 Meters, the latter using an ATU. This is a good aerial but does lack the directivity of a Yagi. I do have problems when it rains as the SWR tends to rise. The manufacturers recommend



drilling holes to allow water to drain away, but this has not improved things. I will have to investigate this problem further as it is annoying when I have to reduce power during a contest!!

If an operator is in the "Assisted" section and has any doubts about a callsign he can look on the RBN list in his contest logging system which will display all the callsigns and frequencies of those on the bands - isn't that cheating? Not really, it is just modern technology!

As a "Non-Assisted" operator I am not allowed to use any support methods like RBN. The disadvantage of this is that you have to be capable of reading every callsign, some at very high speed! During this contest I spotted a country I needed in Africa, I could read his zone ok but in no way could I read his callsign which was coming at me at least 50 wpm! The quality of the morse was bad and he sent his callsign infrequently - a good DX operator would send his callsign frequently. When he did send his call it was being swamped by stations calling him. The exchange in this contest consists of a callsign, 599(waste of time) and a zone, mine being 14. In the end I had to repeatedly ask him to "QRS CALL PSE" I doubt if he was amused but he eventually got the message and sent his call at about 10 wpm! Africa is not too far away, and I would imagine my repeated request was making his job of making contacts difficult!!

When I commented to a DX operator that he should send his callsign more often his reply was, "It doesn't matter because it can be seen on RBN! He had obviously never worked in a " Non-Assisted" category.

New Zealand, Australia, Lebanon, Puerto Rico, Kazakhstan, Afghanistan, Tanzania, India, Hong Kong are just a few contacts I made making the whole event worthwhile. If you are trying for awards this is an ideal contest to participate in.

Having operated most of Saturday by midday on Sunday I had had enough! So, I made time for a few pints of beer at the local Royal British Legion Club, consequently not a lot was done in the afternoon!!

My final score of 584 contacts gave me a score of 113.459, about 80,000 more points than last year so it made the event a great success in my eyes but in context with the rest of the world I doubt I shall win that prize of a Round the World Cruise!



# Good Old Days

By Ken Waites, K5WK

My first short wave radio came from my assistant boy scout leader, 5 tubes including the rectifier. It was something he brought back with him when he got out of the Army. That term of "short wave" had some kind of special magic appeal to me. I wanted to see what that meant, so I purchased it for \$25. Since I didn't initially have money to purchase it, I went to my dad for help. Dad was careful with the few dollars he had, and he knew about "work". So, he said he would provide the \$25 for the purchase if I plowed the lower field (10 acres) with our old horse "Bonnie" and our turning plow. I think dad was pretty sure this would put an end to all this "nonsense". But we had a deal and I plowed the field to his surprise. I was now the proud owner of my new old "short wave" receiver. It had scratches from previous use, lots of dust, all of its tubes, and it seemed to play.

I could hear broadcast stations from Russia, Germany, Cuba, and some kind of missionary radio from Quito, Ecuador. I was exploring a magic region of the spectrum completely unknown to my neighbors and other scouts. I could hear ship captains on the Mississippi River. I sent SWL reports to Radio Germany and received a colorful QSL response. Magic. Radio Moscow, wow! I did not know the term ham radio at that point. But I did hear what sounded like conversation. Then I discovered dots and dashes down the band when I turned on the BFO. Yes, the 5-tube radio included a BFO. I marked the dial.

Then one day I hear people talking to each other in one of these conversations. Of course, it was AM, and 40-meter phone band. I heard this lady giving her address to another operator, and I copied it down. Lucky a pencil was handy. I sent her a letter asking what I had to do to be a ham operator. She wrote me back, telling me about the American Radio League, and three publications I needed to order - One being a license manual. I met the mailman every day until these publications arrived. I memorized Colpitts oscillator diagrams. Why, I still do not know.

I found I had to learn the Morse code, but I was also a Boy Scout, and in 1958 to become a First Class scout – if memory serves - you had to learn the Morse code. So, I went to work learning the easy letters. I remember it took me a while to recall G, W, X, P, and J.

I found the novice band and started trying to copy some of the letters. I still remember the thrill when my paper revealed I had copied " NAME IS BILL ". "QTH IS something, LA". Then I knew I was making definite progress, and I was going to master copying the Morse code! From my ARRL publications, I subscribed to QST magazine, and soon had a Heathkit catalog, and some other catalogs.

In about 3 weeks, I took a Greyhound bus to New Orleans, and passed the Novice exam in the FCC office. Now I needed a transmitter and antenna. From the back of QST I ordered a used Viking Adventurer - a full 75-watt rig! (It had 25 watts more than some of those other rigs!) My dad and a neighbor helped my put up a wire antenna, thinking I was nuts, but not discouraging me. I think by now they just wanted to see how crazy I

had become. I had no idea if the antenna would work. I did not know anything about tuning an antenna.

Now my 12-year-old brother Curt (now N5CW) got into the act also. I think I resented it a bit at first - this was my adventure - but he persisted. License, Viking Adventurer, J-38 key, one crystal for 40 meters. and antenna - we were ready. We soldered the two sides of the open wire to the phono plug output from the Adventurer. Then came the challenge of trying to make a contact. I think I called CQ for about two days until I began turning around just a bit, and one day I heard a W5 answer my call. He was in Lafayette, Louisiana. *Wow!* My head exploded! My feet did not touch the ground. Now Curt was hooked also! Mom baked my favorite dish – a German chocolate cake.

There was no turning back. Soon QSLs were posted on the wall. Neighbors would come by and exclaim “You mean those boys talked to someone in St. Louis?” “My Goodness!” Soon our fame spread. Curt quickly learned the code and got his license right away. Now we were known as those two ham operator brothers from Moss, Mississippi. (Population 91). We were heroes. We understood a language on one had heard before - CW.



**K5RUO (Ken, K5WK) in foreground and  
K5UBL (Curt, N5CW) in background**

And you can bet we were proud.

We did not know there were any other ham operator anywhere nearby. Then came a knock on the front door. My mom went to the door and almost had a heart attack. There stood a highway patrolman in full uniform, gun by his side, handcuffs showing, and a car that had a back seat that looked like a jail. What had her boys gotten into? His name was Wayne Valentine, W5OAE and he had seen the antenna and was curious. Mom slowly recovered. Wayne, Curt, and I became friends. Mom loved to tell the story.

And we discovered other ham operators as close as about 15 miles away. New friendships developed.

It was not long until Sunday afternoons were spent with our high school friends dropping by, mom preparing cookies or cutting a water melon to entertain the curious. The new Southern Baptist preacher had to see the shack. On Sunday afternoon the new Baptist preacher did drop by. He too was curious. Our shack was behind our house – a place our dad had intended to smoke pork with hickory coals, but Curt and I had commandeered it for a higher purpose. After the required greetings and some small talk at his car we walked over together to see the “shack”. Just as the door was opened a very loud explosion occurred, smoke, and hot black tar, and a frightened preacher said



some words I did not know he knew. There was a minute taken to see if anyone was injured by what had sounded like a shotgun blast. As Curt and I entered we discovered an electrolytic capacitor had exploded, part of a home brew converter.

As I recall that was the last time the preacher visited.

Curt and I now were heroes. We gave novice license exams, and you had better be ready to copy 5 wpm. Many of our high school friends also got their novice licenses. We learned we could put a graphite pencil mark on a crystal to move it a few cycles, and we managed to get a few other crystals. We were in full swing. Soon came WAS and RCC. With great pride I became an Official Observer. We put an antenna up at the high school.

We were able to compare the new-fangled S-38E receiver to our own gear. We traveled for miles to see a shack that had a Globe King 300. A visit to a new shack was a great adventure. That is a bug? You can talk to Canada during daylight hours? What receiver covers 15 meters?



Ken, KSRUO (KSWK)

As teenagers we had no real income. The Heathkit catalog showed a rig called the DX-100, but the price was out of our league. Maybe someday.

Soon we upgraded our licenses, built a Knight VFO (half the size of a loaf of bread) and now we were truly free to roam 40 meters. Liberated!

It was later that we managed to get gear that would cover other bands, learn about model 15 teletype, propagation, Q-multipliers, using a bug instead of a hand key, Army MARS. Curt soon became the antenna builder and tester. We put up a 30-foot tower. He built three band quads out of cane poles, and wire. We talked to Africa and Australia!

Curt, the antenna builder, read about another antenna called a Sterba Curtain? Having some wire which had been derived from an old transformer, and a newly cut hay field behind our shack, he started out on a new adventure. Wires were laid out, cut and left lying on the short grass in the field planted with alfalfa. Weeks went by as other work assigned from our dad had to be done. Now the grass in the hay field got tall enough for our dad to have our neighbor with a tractor and bailer come harvest. When the hay was bailed, we had bales attached to bales with wires. Not a happy dad. He almost used those same words the preacher had used. Would the cows even eat this with wire in it? Maybe they would choke and die? Curt and I were on our best behavior for a while, hoping the storm would pass.

That was not the last time our hobby would get us into trouble. But all of that is a whole different story.

# 2020 W5FOC Weekend

By Ken Waites, K5WK

Take in a taste of Southern Hospitality at the W5FOC weekend 3<sup>rd</sup>-4<sup>th</sup> April, 2020 in Ocean Springs, MS. The event will take place at the Gulf Hills Hotel and Conference Center, 13701 Paso Road, <[www.gulphillshotel.com](http://www.gulphillshotel.com)>, 866-875-4211 or 228-875-4211. Room rates are \$104 USD plus tax per night for either a King or two Double beds. Mention Group Name "First Class Operators Club Convention" when making room reservations. The rate is available before and after the weekend as well. Registration is \$80 per person which includes the Hospitality Room and Saturday night Buffet Dinner. Contact Bill, W5SG <[w5sg.bill@gmail.com](mailto:w5sg.bill@gmail.com)> to set up your registration.

There are plenty of activities planned to suit all interests. On Friday afternoon, join W4CI for a sing along in the hotel lobby. The evening dinner will be at Anthony's Under the Oaks where you can enjoy steaks, seafood and chicken. Saturday daytime events include a choice of tours at John C. Stennis Space Center, or Bevoir, Jefferson Davis home, plus many other local attractions. The Saturday evening dinner is at the hotel and will be followed by a presentation by Martin F. Jue, owner of MFJ Electronics. A Hospitality Room will be available both nights. On Sunday morning there will be a short meeting to discuss FOC matters and the 2021 event.



John C. Stennis Space Center

## Agenda

**Thursday, 2<sup>nd</sup> April** – Early arrivals and dinner at McElroys Harbor House.

**Friday, 3<sup>rd</sup> April** – Hospitality Room opens at 12 Noon. Meet, greet and socialize. At 4 PM gather around and sing along with W4CI in the hotel lobby. At 6 PM meet in lobby to travel less than a mile to Anthony's Under the Oaks for dinner. Steak, seafood and chicken are the main courses. The restaurant is built over the bay and features large glass windows for great ambiance. After dinner, gather back at the Hospitality Room for more fun, tales and friendship.

**Saturday, 4<sup>th</sup> April** – Visit any of the coast activities to your liking. From 4-5 PM presentations will take place in the Dining Room. Contact N5CW at: <[curtwaites@gmail.com](mailto:curtwaites@gmail.com)>, if you wish to make a presentation. The Buffet Dinner will be at 6:30 PM followed by our Guest Speaker, Martin F. Jue of MFJ Electronics. The Hospitality Room will be open afterwards for more socializing.

**Sunday, 5<sup>th</sup> April** – Gather at 9 AM in the Dining Room for a short FOC meeting and discussion on 2021 event. Breakfast and departure is at your own schedule.

# Contesting

By Pat Barkey, N9RV



## Culture and Contests

The subway train comes to a stop. The sliding doors open. What happens next depends on where you are. In some places those who are trying to get on pause and allow those getting off the train to leave first. Some places have queues, with those at the front boarding first. And some places have a huge crush of humanity converging on the narrow door opening all at once.

We all come from different families, with different upbringings. And from different countries and different continents with different cultures and ways of cooperating. Go to a different country and watch how they queue for everything from movies to airlines. It is distinctly different. Rules of cooperation are literally all over the map, with cutting in line a capital offense in some, and simply expected behavior in others. Airliners board pretty quickly in Asia, not so fast here in the states.

This is a story about ham radio and ham radio contesting as well. Rare DX creates pileups. Clear frequencies attract those hunting for a place to CQ. Some ask QRL, some don't. And some who do ask don't wait for or pay attention to answers. How we interact with others on our frequencies and in our competitions is part technology, but our own individual actions are a reflection of who we are and how we behave.

I am not a sociologist or an anthropologist. But its easy to see that how we behave in cooperative settings – be it getting aboard a crowded train or calling a VK9 on 160 meters – is influenced by our national culture as well. Do you wait your turn or barge ahead?

## Hitting the Button

There's no single, simple measure of pileup behavior that you can track over the years to say anything definitive about today's state of affairs versus years past. But one thing we do know. And that is that technology has changed. We can send our call in a pileup by hitting a button. The use of computer sending for CW contests has become almost universal. Hit the button three times, and voila! Your call is sent three times.

For many of us, this is a candy that is simply too sweet to resist. Especially with the shorter contest call signs so prevalent these days and high speed CW. Who did the running station come back to? Hit the button. A partial call sign? Hit the button. If no one else responds and we call in the clear, then maybe we will get through. Especially if we are running high power and gain antennas.

Of course, if everyone ignores the running station's instructions, the result is a big mess. And there are plenty of big messes on the bands these days. DXpeditioner W0GJ got some people upset when he documented that QSO rates to Europe were less than half as high as those to North America from the K1N Navassa Island DXpedition in 2015, and he attributed those differences to operator behavior. And in particular non-stop calling.

It's a little like the old prisoner's dilemma game. You may have heard it before. Two people are arrested for a crime and are separately interrogated. If either one confesses, they will get a lighter punishment, but the other will go to jail. But if they both remain quiet, they will be released. But since they cannot control what the other does, the story goes, they confess. And both go to jail.

And so we call in pileups out of turn because we fear that others will do this as well. Even though mutual cooperation would result in everyone getting through faster.

### **QRO: Hiding in Plain Sight**

At least operating behavior is out in the open. The calls of stations who crash the gates and barge their way through pileups are out there for all to see. And, of course, it involves almost everybody. Which is a shame for contesting.

Is everyone running QRO? Or should I say QROOO? That has different definitions in different places, of course. Individual countries and license classes impose different limits on transmitter power all over the world. But there is at least one that is universal – the CQ WW contests say that total output power cannot exceed 1500 watts.

That, of course, is the power limit in the United States. Its easily breached by anyone running an amplifier capable of it. And most contest grade amps can easily do it. Just turn the knob up a bit.

Such transgressions are mostly trivial, of course. What is less trivial is the ready availability of commercially constructed, highly reliable amplifiers that are capable of delivering three or four times as much as that limit. Together with the kind of baluns, switches, and other components built to handle it. All dropped at your door when you give them your credit card.

That kind of power conveys a significant advantage in competition, even if those benefits are limited to the transmitting side of the QSO. Obviously, the antennas remain the biggest part of a competitive contest station. But given any set of antennas, adding 6 dB more power is just that. 6 dB more than your competition.

Or is that really it? Perhaps you are 6 dB down from the competition if you remain at 1500 watts? Are we back to that prisoner's dilemma game again? If everyone else confesses and runs QROO, you are the one left holding the bag. On the other hand, if you are wrong-headed in thinking that everyone else is running big power, then you are just a cheater.

### **The Culture of QRO**

Did I already say I wasn't a sociologist? So, I really don't know why different attitudes exist for any of these things. But I clearly see different attitudes towards QRO, between countries, regions, and continents. And I see the "everyone else is doing it" explanation being the most prominent explanation offered by those who push past the 1500 watt limit by a meaningful margin.

Perhaps that is true. If power levels in a class of competition are roughly equal, then at least the competition is balanced in that respect. It may offend some that laws are not followed. And it may be unfair to those who are not aware of the "real" power rules.

But this is a problem for contesting, for a number of reasons. If by our behavior we replace one rule (1500 watts) with another (6000 watts?), then the question is, what is

the “real” rule? Because if there aren’t rules, its hard to see how any competition has meaning and can be judged.

A bigger problem, in my opinion, is that the “everyone else does it” logic is not limited to QRO. For example, it is well established in contesting rules that post-contest editing of logs to reduce scoring penalties is not permitted. Yet it happens – in contest clubs, in multi-operator competitions. Emails, databases, algorithms exist to cleanse and sanitize logs in advance of submitting them for the competition. Does everyone really do this?

I am not sure how to close this discussion. The ready availability of amplifiers that will pump out 4 or 5 times the 1500 watt limit is a reality that is not likely to change. Perhaps it is contest rules that should. But will that really solve anything?

## Welcome to New Members

By Tyler Barnett, N4TY

### Mark Haynes, MØDXR (2136)



First licensed in 1996 at the age of 12 as 2E1ERN, upgraded to 2EØAPH and obtained MØDXR in 2000. Married to Georgina, M6YGL. I have two daughters Rebecca and Chloe and two step daughters Francesca and Olivia. My father is Keith G3WRO. I enjoy contesting on all bands in the HF and VHF spectrum. Keen CW and SSB operator. Contest activations as: G9W (personal SCC), G5W (from G3BJ), K3LR (Multi-Multi team), G6PZ, M6T (Multi-Multi team), T15W/TI7W (Multi Two team), P3F (5B4AGN QTH), GMØF (GM4AFF QTH), GM9W, MØC (CDXC SCC), G1A. DXpeditions include D68C (2001), 8Q7ZZ (2002), FT5XO (2005), 8Q7XR (2008) and many operations as TI5/MØDXR. Past Young Amateur of the Year (1999). Founder of Contest University UK. Professionally, I am a senior project manager for a large defence organisation in the UK and have been in the industry for 18 years. I am a strong believer in promoting our hobby to encourage fresh blood to keep it alive. I hope to work you all many, many times on all the bands!!

### Keith Williams, GW4OKT (2137)



Main interests: CW ragchewing, the occasional contest (the short ones), I hold the contest call GW4D. Antennas and QRP/P are also high on my list of favourite activities. I am a part-time (sleeping) tutor for Bath Based Advanced Distance Learning and have taught at all three levels of licence. I also taught the old RAE back in the 1990s!

I produced a maths e-book, to help ease the transition to the UK full licence, it is free, and the link is at the bottom of my QRZ page. Outside interests are photography, cars & fly fishing (any fishing!).



I have two rotary dipoles up at 5m, consisting of the two driven elements from an MA5B beam, turned through 90 degrees and using the boom as a stub mast. Five bands and a very neat setup!

For the lower bands, I use a Hustler 6BTV vertical. My QTH is tiny, so these options have worked well for me over the last 5 years.

I use a K3 with KPA500 amp, but I also built a K1 and K2 for QRP ops, really smart kits, (yes, I'm an Elecraft fan). I've managed to bag most of the popular awards and also hold a Diamond DXCC and QRP DXCC. These days, my main goal is to continually improve my CW and just enjoy my life on the air.

## **Ralph (Gator) Bowen, N5RZ (2138)**



I was introduced to Amateur Radio at an early age as my parents are both hams. Dad is K5LHO and Mom is K5JRT. Got interested in SWLing in the mid 60's, and received my Novice call, WN5AAR on October 15, 1969. Upgraded shortly to WB5AAR thereafter and enjoyed a lot of DXing with my modest station until going to college in August 1973. CW was my passion and I became an active DXer and Contester. During the college years and for a while thereafter, I had no home station. Was active briefly in 1975-1977 at another university club station across town. I became N5RZ in 1977. Built another station in the early 1980's in Amarillo, TX. After a career change, I built a "contest grade" station in East Texas from 1988-1991; then got transferred to West Texas, where I enjoyed a 25-year career as an accountant in the Oil and Gas Production Industry. I built two stations during that time; at one QTH from 1991-2003, and the other from 2010-2016. On December 31, 2009, I met the YL (Deborah) I would eventually marry in February 2017. We had only been dating for 5 months when I asked if she would be interested in becoming a ham. She became KF5HHD in June 2010, and eventually upgraded to Extra Class the following year and got the call K5RZA. She knows the code but is reluctant to use it. She enjoys RTTY and Phone contesting. We have both retired to the Texas Hill Country, near Fredericksburg, TX, about 90 miles west of Austin, TX. We are in the process of building a multi tower station to enjoy for years to come. Will be active on all bands 160M thru 23cm, and maybe even higher eventually. Apparently, many of my CW buddies I have worked over the years are also FOC members. I thank John, AC4CA, who I met when I moved to my retirement QTH for proposing me for membership, and to my nominators: N5AW, W4WJ, N9RV, W1FJ, SM2EKM, ZL2IFB and G4RCG for considering me worthy of membership in this prestigious organization.

## Tim Duffy, K3LR (2139)



I have been an active amateur radio operator for over 47 years. Amateur Radio has been my entire life. CW always my first love. Met FOC member W3AU (W3MSK) when I was 16 and I operated at Ed's FB station. Bill, N4AR was a major influence on my love for CW DXing. I've hosted over 140 different operators as part of the K3LR multi operator events since 1992 – which have made over 770,000 QSOs. I served on the ARRL Contest Advisory Committee as a member and multi-year Chairman and I have been an active member of the CQ Contest Committee for 29 years. I was the Atlantic Division Technical Achievement award winner in 1998. I was also moderator of the Dayton Contest Forum for 10 years and am moderator of the Hamvention Antenna forum now for 36 years. I'm a founding member and President of the North Coast Contesters and I serve as founder and chairman of Contest University (13 years) and the Dayton Contest Dinner (27 years), chairman of the Top Band Dinner (8 years) – and coordinator of the Contest Super Suite (34 years) in Dayton. I'm founder and moderator of the popular RFI Reflector (RFI@contesting.com).

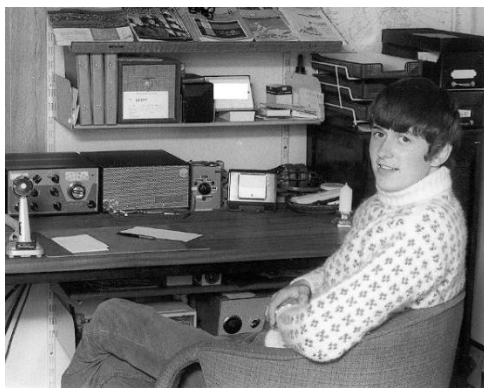
I've been a guest on Ham Nation many times. I was a member of Team USA at WRTC – five times. I serve on the board of directors of the World Wide Radio Operators Foundation (WWROF) as Chairman. I was President of The Radio Club of America (RCA) from 2016 to 2018 and I am President of the Mercer County Amateur Radio Club - W3LIF (18 years). I was elected to the CQ Contest Hall of Fame in 2006 and I was honored with the prestigious Barry Goldwater Amateur Radio service award by RCA in 2010. I served as ARRL Section Manager for Western Pennsylvania 2015/2016. I currently serve as a director on the ARRL Foundation board and I was honored to be the 2015 Hamvention Amateur of the Year. I enjoy CW rag chews. CW is my first language! Finally, I was awarded the YASME Excellence Award in 2016. I have one son who is not (yet) a ham. I am a graduate of the Pennsylvania State University and I am the Chief Operating Officer and General Manager at DX Engineering.

## Who are They?

The two members in the picture in Focus 119 on page 45 were Derrick, G3LHJ (left) and Roger, G3SXW (right).

I received only two answers. Fabian, DJ1YFK guessed them both with his analytic approach. Fred, G3YJQ recognized only Derrick.

The picture of the member on right is from 1971.



# Improved Band Conditions Brings Out the Members

By Art Suberbielle, KZ5D

Propagation good enough to support QSOs between North America and Europe on 15 at this time in the solar cycle? No way, you say. But the stout hearted did manage to enjoy the much improved conditions this year for the 14 September NAQP. Finally, we got a break for the semi-annual FOC QSO Party and many reports were received commenting about the better conditions. (However, a good number of comments about poor conditions were also received.) This may have been the motivation for more participation by members in our event. Certainly the reports received indicate as much, as we can celebrate reaching an all-time high with 173 from members and 50 from non-members.

Member comments provide interesting reading. Top honors this time goes to Sig, N3RS with 541/426. Here's what his take was: "12 hours in the chair. Conditions were terrible. Weak stations and received loads of 559 reports. Had fun working old friends." Europe reports were paced by Marco, IKØYVV, with 464/347. Here's his view: "Cndx has been nice on 20 and 15. Unluckily low activity in my opinion ...13 hours on the air." What follows is a representation of the comments from the participants.

**GM3JKS:** What a pleasant change to hear some activity on the bands in spite of the poor condx. **K8MFO:** 36 QSOs on 15 meters, 18 of which were Europeans. Some were loud. What a pleasant surprise. **DL6KVA:** My log includes exactly 200 different FOC members so I guess participation in one of our 3 main activity events could be even higher. **K6KII:** Conditions were better than I expected with a good number of QSOs and several Europeans! **G3RWF:** Conditions could have been worse. Fair opening to USA on 14 despite my wire antenna including West coast. Even 15 made a feeble effort!

**G4ILW:** Nice event compared to previous ones. Conditions wise. **K6AR:** Not great but not terrible conditions. **VK2BJ:** Lousy conditions but spent a few hours on 40 and 20. **OY1CT:** Conditions was not very good this time, only a few NA members worked. **UA9BA:** It was great to see the bands open over the pole after a long time.

As we state in the information promoting each one of these events, make it what you want it to be. At the end of the day, I hope that each of you had an enjoyable time. Many ops were limited by time commitments but did jump in for some fun. Others suffered high noise issues or rig problems but managed a handful of contacts. Some participants use the QP as a way to find "elusive" members to make that first time QSO for their Auggie Award pursuit. Still others find old friends on the air and strike up a chat. As much as possible, we really want this to always be an operating event that addresses everyone's interests.

Non-member activity continues to be high with W1SOC (op. N4BP) reporting the highest total of 321 contacts. 9A1AA had the highest report from Europe with 234. It's good to see the large percentage of non-member contacts in our members' reports. N3RS has 21% of QSOs with non-members, while IKØYVV reported 25% non-member contacts. And from the West Coast, K7NJ made 29% of his total with non-members.

The following is a listing of the top two stations on each continent. All continent leaders will be receiving a handsome certificate to commemorate their accomplishments.

FOC QSO Party -14<sup>th</sup> September 2019

Continent	FOC	Score	Non member	Score
Europe:	IKØYVV	464/347	9A1AA	234
	DL4CF	446/347	LZ1HW	130
North America:	N3RS	541/426	W1SOC (op. N4BP)	321
	K3WW	537/422	N4FP	195
NA West Coast:	K7NJ	372/265	W7OM	68
	K5RC	274/201	NX6T (op. WQ6X)	37
Asia:	UA9BA	95/77	JJ1YHC	12
	JA1GZV	14/6		
Africa:	9J2BO	75/35	No reports received	
	ZS1C	11/10		
Oceania:	VK2IA	63/41	VK5GG	11
	VK2BJ	40/31	VK2GR	11
South America:	No reports received		PY7AMF	17

Members result

Call	QSOs	FOC	Call	QSOs	FOC	Call	QSOs	FOC
N3RS	541	426	K6AR	259	202	N3AM	198	158
K3WW	537	422	K8MFO	250	210	WB2YQH	196	164
K5OT	526	412	K3MD	248	172	W2TB	191	152
K5KG	494	367	NM5M	247	192	G4RCG	186	150
IKØYVV	464	347	OK1RR	243	216	KF3B	186	141
DL4CF	446	347	WØJX	242	232	SM6CUK	182	167
DL6KVA	444	367	SM5CCE	225	190	G3RVM	180	159
KZ5D	435	334	K9QVB	223	192	K2SX	178	144
HBØ/DL5YM	379	287	W4PM	220	173	K4BAI	178	138
W1FJ	375	308	DL5YL	215	176	G4BYG	176	138
K7NJ	372	265	NA5G	214	204	DK1WI	169	150
F6HKA	336	254	WØVX	214	197	AD5XI	167	123
WØUA	308	214	K5AX	211	162	W1RAN	166	152
W3YY	298	257	AE1T	210	167	SD1A	163	128
N5AW	293	231	G3RWF	208	168	<i>op. SM1TDE</i>		
N3BB	288	214	K5WK	207	191	DL1VDL	161	155
NØAV	276	207	K2QMF	204	204	G4ILW	161	130
K5RC	274	201	K1DW	203	175	WR5U	159	145
GMØGAV	271	206	W4WJ	203	166	SM5COP	158	150
K4XU	269	215	N5CW	201	160	PAØVDV	152	123
OE2BZL	261	224	DL3AZ	200	165	OK1CF	151	103
<i>op. DK5AD</i>			LB2TB	200	164	G3WPH	150	126
W5ZR	260	197	DJ6ZM	199	164	GM3WUX	148	116

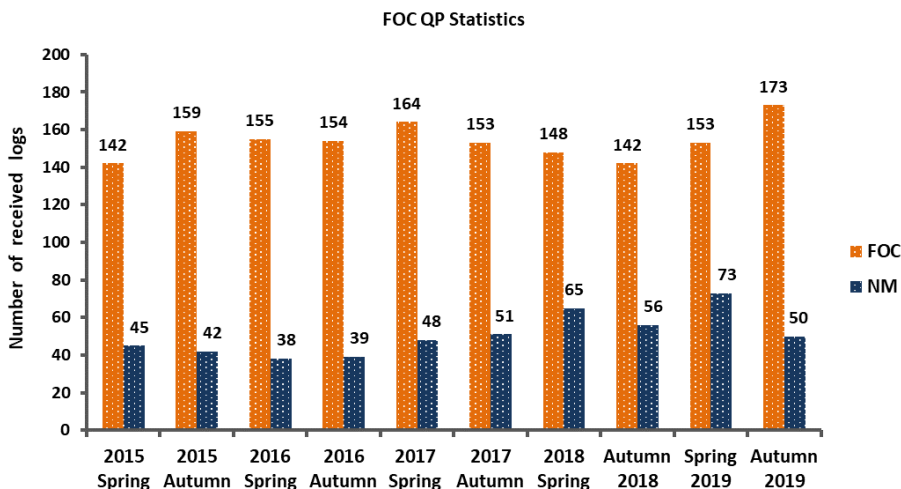
<i>Call</i>	<i>QSOs</i>	<i>FOC</i>	<i>Call</i>	<i>QSOs</i>	<i>FOC</i>	<i>Call</i>	<i>QSOs</i>	<i>FOC</i>
GØEFO	147	133	W4CK	92	82	W8KR	58	51
DL5YM	145	145	N2KW	91	80	G3NKS	54	50
GØORH	143	122	CT7AGZ	90	83	PA7RA	54	54
K3ZO	142	124	OZ5DX	89	73	PAØDIN	53	50
K2AV/VE3	140	120	K5KV	88	82	W1EBI	48	38
K6NA	140	121	MØIHT	88	73	W4TJE	48	40
DF4XX	139	111	UR5MM	88	81	AC4CA	45	22
K5VWW	137	109	DF4BV	85	67	DF2IC	45	43
VE3USP	137	118	K6KII	82	76	KF7E	45	43
G4RMV	136	133	SV1RUX	82	75	EA6/SM2EKM	41	35
W6RGG	136	114	W1AO	78	70	G3YLA	41	40
W4YE	132	119	OZ2A	77	73	VK2BJ	40	31
WA1FCN	132	108	9J2BO	75	35	K2SG	38	38
DJ1YFK	131	111	GM4SID	75	63	K7HP	38	33
PA5TT	131	121	GM3JKS	74	66	WØCP	33	14
G3LIK	121	101	HB9BFQ	74	63	K1AJ	32	30
OH2EA	119	110	KR3E	73	66	G3YXX	25	21
W7RF	118	90	TF3DC	73	66	F3OA	24	23
OK2LA	111	86	G3SXW	70	61	RM2D	23	21
G13PDN	110	101	OH2KI	69	55	G3LDI	20	19
K3LU	110	95	IKØYGJ	68	55	GW4OKT	20	20
K5TF	110	98	W3EEK	66	58	VK4TT	20	19
WG4FOC	110	80	W7AQK	66	63	GØPNM	19	18
<i>op. K3TW</i>			W4ZYT	65	56	VK7CW	19	14
KØVBU	109	91	W7QC	65	48	W4VQ	19	18
GM4EVS	108	94	W7GKF	64	55	OZ1LO	16	16
N2ATB	108	89	N8NA	63	52	JA1GZV	14	6
W1RM	108	85	VK2IA	63	41	K1SA	14	14
OY1CT	107	89	AC2K	61	58	OH2BN	11	11
W5ZO	106	87	K2RSK	61	56	ZS1C	11	10
G3YJQ	105	105	VE3HX	61	56	KH6LC	9	9
G3PJT	104	100	G3LKZ	60	58	DJ4KW	8	8
G4HZV	104	96	IKØIXI	60	48	VK6GX	8	6
K5LY	104	95	K3AU	60	49	SV5/G2JL	7	6
AK5X	100	85	<i>op. K2YWE</i>			9V1VV	6	5
UA9BA	95	77	K5VR	59	52	K6WG	3	2

### Non-members result

<i>Call</i>	<i>FOC</i>	<i>Call</i>	<i>FOC</i>	<i>Call</i>	<i>FOC</i>	<i>Call</i>	<i>FOC</i>
W1SOC	321	K5DU	90	DD7CW	49	W4AN	17
<i>op. N4BP</i>		N5RZ	82	VE3NNT	43	<i>op. K4BAI</i>	
9A1AA	234	LZ1YF	70	NX6T	37	NF8M	16
N4FP	195	W7OM	68	<i>op. WQ6X</i>		DL7LPH	12
N8AA	180	W5FB	65	AI6O	35	IK1WNO	12
WBØSND	134	SQ9S	59	AB1BX	34	J1YHC	12
LZ1HW	130	W3WHK	54	KM4FO	29	SM3CZS	12
SP7VV	121	A14WW	53	AA8TA	27	IUØHMB	11
SM7CIL	112	K3YP	51	K8RGI	27	SMØOY	11



<i>Call</i>	<i>FOC</i>	<i>Call</i>	<i>FOC</i>	<i>Call</i>	<i>FOC</i>	<i>Call</i>	<i>FOC</i>
VK2GR	11	YO3GNF	10	N6HCN	6	EA3OH	2
VK5GG	11	W8IM	7	K6ST	4	KF2TP	1
DM2DZM	10						



## Inside back cover Focals

**Top:** Fred, G4BWP (middle) and Pete, GØPNM (right) handing over the appreciation gift to Michael, G7VJR (left)

**Middle left:** Presentation of the Begali paddles at the AGM with Bruna Begali (left); James, G4ILW (middle) and Roberto Taglietti (right).

**Middle right:** Anniki and Jorma, OH2KI

**Bottom left:** Bill, N4AR and Riki, K7NJ

**Bottom right:** Mike, G4RMV and Keith, GW4OKT

*All photos by John, G4IRN. -S57WJ, Ed.*





# 16th IARU World HST Championship

## 13 - 17 September 2019

### Albena, Bulgaria

