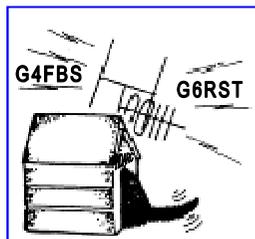


# Horndean & District Amateur Radio Club Journal

Volume 5

Number 9

August & September 2021



**RSGB 2 metre contest organised by  
Adrian G0WEJ and Martin G8IQL**

Horndean & District Amateur Radio Club  
Founded in 1975

## Club President

Lt Cdr Doug Hotchkiss MBE QCB RN (ret'd) G4BEQ

## Club Officers

**Chairman Ken Lindsay GØJWL MA**  
Tel 02392 170548 e-mail: chairman@hdarc.co.uk

**Secretary Stuart Swain GØFYX**  
Tel 02392 472846 e-mail: secretary@hdarc.co.uk

**Treasurer Bill Kenway 2EØWGK**  
Tel 07976276304 e-mail: treasurer@hdarc.co.uk

## Committee Members

Membership Secretary Tel: 07976276304	Bill Kenway 2EØWGK e-mail: treasurer@hdarc.co.uk
Social Secretary & Exam Secretary Tel: 02392 785568	Julia Tribe GØIUY e-mail: juliatrube@ntlworld.com
Training Manager	Ken Lindsay GØJWL e-mail: chairman@hdarc.co.uk
Training Associate (ex officio) Tel: 02392 785568	Simon Tribe GØIEY E-mail: simontribe@ntlworld.com
Station Manager Tel: 07724048212	Chris Jacobs MØKTT e-mail: oldbikenut1@gmail.com
Editor (ex-officio)	Ralph Heslop 2EØHES e-mail: landscape@sky.com
Printer (ex-officio) Tel: 02392 256768	Peter Tagg G8PIQ e-mail: g8piq@btinternet.com
Awards Manager	Please contact Stuart GØFYX with any award applications or enquiries
Webmaster (ex-officio)	Neil Stone 2EØLNK e-mail: neil.stone@gmail.com
Committee member	Jon Dunster MØXUE e-mail: jond@protonmail.ch
Committee member	Alan Waller 2EØFEZ e-mail: alanwaller82@gmail.com

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Articles, letters of interest, photographs are always needed and should be sent to the Editor :- [landscape@sky.com](mailto:landscape@sky.com)

I use Microsoft Publisher to produce the journal so am happy to accept articles/photographs via email. A Word document or Picture attachment. Just use Journal article or Journal picture as the subject matter.

Opinions expressed in the journal are not necessarily those of the HDARC. The editor has the right to reproduce the articles for our affiliated club journals/newsletters. The Editor decision is always final.

**Closing date for next journal is : October 1st**

## Editorial



Hi Everyone

By the time you read this we would have had our 'odd' Friday meet on the 23rd July attended by 13 people, and a warm welcome back to Sean. Full meetings and registration for training to commence on 6th August, also a warm welcome back to our special event contest station G4FBS/P for the RSGB Low-power 2 metre contest. See write-up on pages 12./13.  
Ralph 2E0HES

### Club Clothing

**Sweatshirts   Polo-Shirts   T-Shirts   Fleeces**

**Sizes:** Small = 36 - 38" - Medium = 38 - 40" - Large = 40 - 42" - XL = 42 - 44"

Available with club logo only or logo, name & callsign

**Cap - One Size only:** with adjustable strap - Stitching in Yellow

Available with callsign only or callsign and/or name

Some items available in various colours, see **Stuart G0FYX** for details

All articles appreciated



Any articles you think you have that will entertain your co- members  
then please send them in to Ralph at [landscape@sky.com](mailto:landscape@sky.com)

In the last week, I also put together a cheap (\$12) Chinese QRP antenna tuner that I had bought on eBay in early 2018. I thought it would be the perfect companion to the WSPR beacon, to match my antennas with it, since the beacon's mW-range output power is insufficient to move the meter's needles of my MFJ-941 tuner.

However, after I finished putting together the kit and tried it out with the WSPR beacon, I noticed it had some crippling issues. The tuner works OK to match the beacon to my doublet and long-wire antennas in 80m and 40m, but it is unable to find a match in 20m or higher bands. Also, after a few WSPR transmissions on 40 m with the new tuner, I noticed that my signal reports had very low SNR values compared to what I had been getting before, when I was using my MFJ-941 (which I tuned with the help of my antenna analyzer). At that point, I decided to measure the power at the output of the QRP tuner using the ADL5513-based power meter. That's when I noticed that the tuner has a loss of more than 80%!

That surprising high loss led me to Google on the issue and I found webpage: <https://radioaficion.com/news/review-qrp-manual-antenna-tuner-ebay/> with an interesting analysis by a fellow ham of the very tuner I had built, and the explanation of the reason for such losses. The main one being poor quality of the provided components (and may be even wrong/fake toroid type). Beyond quality, also the low capacitance of the provided poly-varicon capacitors for the matching T-network is also described as a source of high losses in low frequencies. Moreover, their Q appears to be also low becoming another source of high losses. Now I am feeling motivated to build a tuner from scratch (using the same schematic, or perhaps the schematic from the QRPGuys's tuner: <https://qrpguys.com/multi-tuner>) but employing good quality capacitors and toroidal cores this time. All the issues I encountered in these project builds carried the added value of a good learning opportunity, from better understanding transistor bias, to proper RF shielding in transmitters, and loss in matching circuits.



## QRP antennas and 9:1 UNUN and 49:1 End Fed Half Wave Dipole Match box

Chris ... W7AMD

I am preparing for a long RV trip to the National parks in Utah and wanted to check out my FT 817 QRP field “go Bag” before heading out next week.

For QRP operation with the FT 817 I use mostly my Super Antenna MP-1 because it can be mounted in lots of differing conditions, is easily tuned to resonance by hand and covers 40-10m but does need radials and it's a bit bulky in my bag. Sometimes it nice to have a full sized wire antenna weighing just few ounces that can be quickly thrown over bushes or out of a window or high dry rocky location so I have a couple of home brewed wire matching units. The 9:1 is built on 3 small #61 mix toroids and mounted inside an old 35mm film canister and I made it as a “back up” as it's not really favoured as it needs a counterpoise and a tuner. The other is an EFHWD matching unit built into a small metal Pamona case. They both follow conventional designs seen on the web and in antenna books. I used #61 mix because that's what I had available, not a perfect choice but I made it work. I had to use 3 of them to make the 9:1 have a fairly flat match to a 450 ohm resistive load across the 40 to 15m bands. I used just one to make a 20m EFHWD match box, however it wasn't nice and flat across the whole HF band which didn't matter because I'll only use it for 20m with a single 33ft wire.

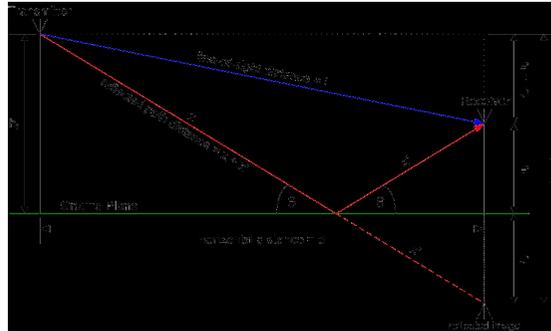
I tested the EFHWD box with 33ft of wire over some 8ft bushes in my back garden it sounded very lively when connected and I worked into Ontario Canada SSB with just 5w so I was happy with the limited design. I had the Super Antenna MP-1 on the lawn at the same time and it had similar 20m level signals. I changed band on the MP-1 to 40m and called into the 7.155 Happy Hour net and was heard but not strong enough to carry on a conversation, “there's Chris W7AMD in there but he's too weak”. At least they heard me!!





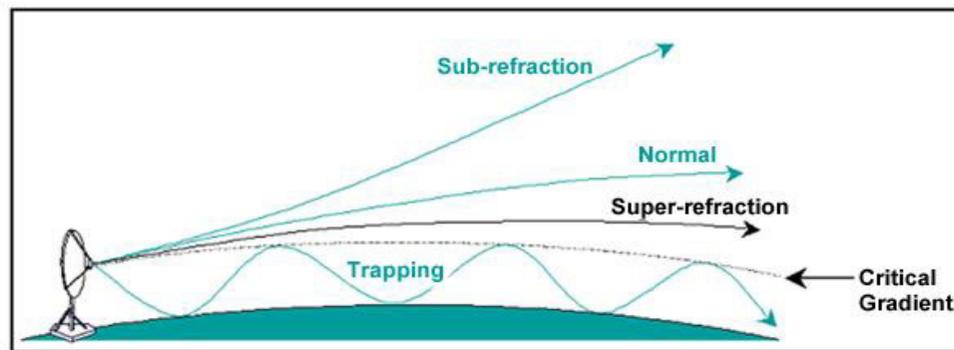
Many years ago I used to give a radio propagation lecture at conferences called "The Tions", Reflection, Refraction and Diffraction pertaining to VHF, UHF and SHF radio path planning for commercial radio link systems. Whole books are dedicated to the topic but here are some simplistic definitions as follows:

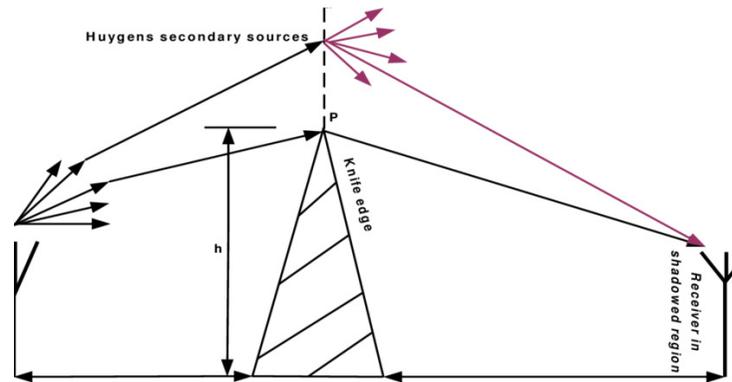
**Reflection:** The bouncing of a signal off a solid object or atmospheric boundary condition, like your reflection in a mirror or other reflective surface.



**Refraction:** The bending of a radio wave due to the effect of the atmospheric condition that exists along the path. This is a variable condition and under "normal" conditions actually allows a radio signal to bend and go beyond the normal optical line of sight (LOS) path. This is the condition that is often the root cause for what ham V/UHF operators often call "a lift", technically called super refraction a condition where the radio signal is carried beyond the normal "radio horizon". The Refractive Index is a constantly variable condition and needs to be assessed for variances from the normal or else the radio path may fail under some conditions.

Propagation Paths for Different Refractivity Conditions



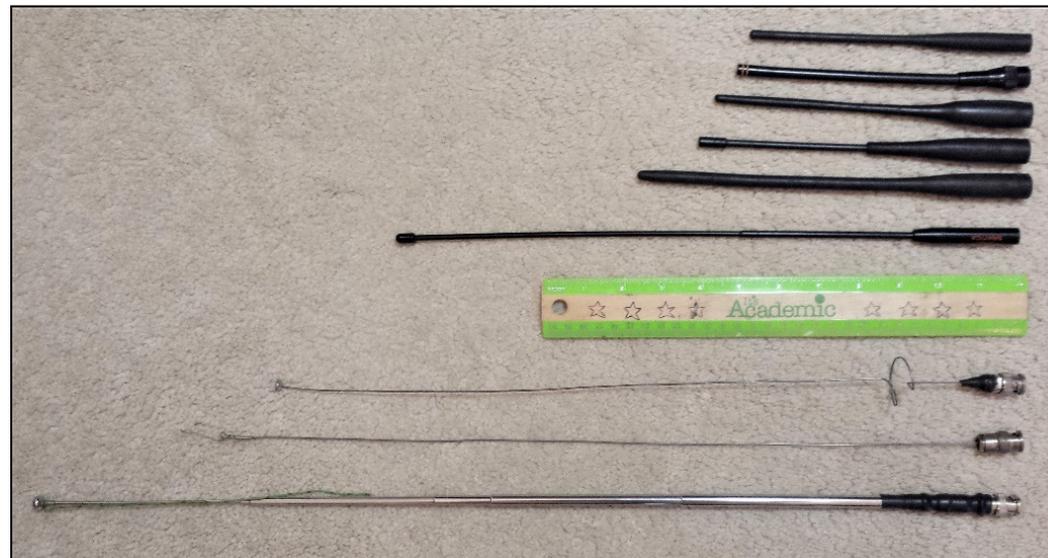


**Diffraction:** The scattering of a signal as it passes over an obstruction like a mountain top, causing the signal to be heard beyond LOS on the far side of the obstruction. The size and shape of the obstruction effect the amount of scattering that occurs. Many non-line of sight NLOS microwave paths have been planned and installed around the world and if engineered correctly can provide reliable paths. Radio system path planning over sea and water paths is especially challenging due to widely varying atmospheric conditions that can change the Reflection points seen by the path antennas as well as dramatic changes in Refractive Index that often occur during sunrise and sunset.

One special over water path condition is the formation of an atmospheric duct usually as a result of a “temperature inversion” directly above the water path. In the many years that I planned radio system paths I’ve seen the disastrous outcome of such ducts causing wild variations of received signals and at times complete loss of what was an otherwise optical LOS path. Radio site locations can become isolated due to the duct, especially those paths where one site is at sea level and the other end is a “high hill or mountain site”. Simplistically, the signal from the low site is trapped in the duct and the path to the higher site is lost. The signal from the high site can’t penetrate the upper boundary of the duct and is reflected into space. Hams love them of course as they usually make for long V/UHF paths over the water. Until recently I had never actually seen a water duct form before my very eyes. Sitting on the beach at Semiahmoo Lodge recently in the late afternoon looking out west across Point Roberts to the open channel I noticed that the sea horizon (approx. 3 miles) was looking bumpy and within a few minutes the bumpiness grew in height and density. It looked like moving mountains to the naked eye. Using binoculars it was very clear that it was a very clearly defined duct (the top of the duct was almost a perfectly straight line) over the far sea channel with a “Mirage” of the far coast many miles away beyond sight. It was so large that family members were fascinated to watch the image dancing within the duct on the horizon clearly visible to the naked eye. After about an hour it broke up and the sea horizon was back to normal. Physics 101 right before your own eyes!!!

**Hand Held Antenna testing.....Bigger is better.....mostly**  
**Chris W7AMD**

I've collected a variety of "Rubber Duck" antennas over the years as well as made more than a handful of home brew ones too. If you've ever played with a handheld and compared the small whip it came with versus a "full size, or High Gain" aftermarket you've probably realized that bigger is better already. But how much better? Read on to find out. As I had time on my hands and some test equipment I decided that I'd make a little real world antenna range to run between my test bench and a mag mount with a BNC connector on the top of the roof of my car. My bench signal generator drove a test antenna in the middle of the 2m band, and the test antennas went out to the car so that I could quickly change the whips and make a note of the signal indication on my FT817 radio. I made the REFERENCE antenna my home made quarter wave piano wire antenna, setting the transmitted signal such that I had an S8 meter reading on the FT817. I then proceeded to change the whips on the Mag Mount BNC fitting without moving the mag mount or the coax feeding the radio inside the car, and noted the signal strengths received. It was interesting to see the effect of cars and kids on bikes passing by in the street thankfully only a few during my testing. I repeated the testing twice to make sure that I had solid repeatable numbers. Once completed I tested the VSWR presented to the radio, and brought the results into the shack to tabulate the results and calibrate the FT 817 S Meter. Now obviously this is no professional test range.....and having in a previous work life built such a range I clearly knew the limitations of my tests, reflection paths and all, but I only wanted a relative comparison. Fortunately the results were actually what I expected within the limits of the measurement process used.



## Tested antennas...The “Big Stick” is an End Fed Half Wave over 42 inches fully extended

Here are the test results that pretty much follow the “Bigger is better” line. If you do SOTA and want to get more contacts try one of these 42inch EFHWD whips. Be careful because just about all hand held radios have now gone to the SMA connector. Make sure the antenna screws fully down the thread and the shoulders of the antenna base rest on the radio case, if not it’s pretty certain that the long antenna will break the little connector if you apply any force to the whip. However, the reception is markedly improved over any of the “rubber ducks”. The smallest of these whips is on my new ID51 DStar radio, cute but even with 5W output I cannot access the PSRG repeater downtown from inside my home, but the aftermarket Diamond that is almost a full quarter wave long on 2m makes access easy!

Hand Held Antenna testing				
Antenna Type	Length inches	VSWR	RX signal "-dBm"	Signal Difference dB from REF
BigStick EFHWD	42	1.3	97	3
1/4wl whip	19.5	2.4	100	REFERENCE
2m/70cm whip homebrew	18.5	2.4	100	0
Diamond SRH77CA 2m/70cm	15.75	1.2	100	0
Yaesu FT 817 Dual Band	10	2.1	103	-3
Yaesu FT 530 Dual Band	8	4	104	-4
Yaesu FT51R Dual Band	8.875	4.7	107	-7
Misc brand VHF only	7.125	2.8	107	-7
ICOM ID51 dual band	6.85	1.8	108	-8

Note how many of these “factory whips” have a poor match. Sharp eyes will see that I did in fact add a piece of my famous green wire to the top of the Big Stick whip because as built the whip was too short and favored the top of the band. The broadband PA gain blocks in modern radios are fairly tolerant of VSWR and I don’t think any of the handy type radios have any fold back circuitry in them. My new ID51 cautions you to make sure an antenna is in place before transmitting to avoid damage to the radio, so they are not bullet proof! My FT817 has a fold back system and displays SWR and kills the output if it’s too high. Are these numbers. Often their gain responses would be -15dBd at band edges. I worked with one antenna manufacturer who admitted using a 3dB resistive load to “improve the matching problem”, and another vendor had a finned heat sink at the bottom of their broadband antenna!! Antennas are interesting things for sure. The RX signal is listed in negative dBm...so the smaller the number the stronger the signal. I’ve shown the relative differences in dB on the last column comparing each of them to the REFERENCE quarter wave whip. So the difference from the little ID51 rubber Ducky to the Big Stick EFHWD is like turning on an outboard amplifier...the difference is a **HUGE 11dB** but it’s very hard to put it in your pocket when you walk the dog; I know because I’ve tried!!

## 2 Metre contest Organised by Adrian G0WEJ and Martin G8IQL

4 members of HDARC took part in the RSGB 2m LOW POWER contest on 31st July. The team consisted of Adrian G0WEJ, Martin G8IQL, Rod G0ERS, and Ralph 2E0HES, setting up/break down was assisted by Stuart G0FYX. The station consisted of an 8ele yagi handraulically rotated, this was fed by a length of Andrews LDF250 Heliax, last used at a club event in 1999!. Radio was an FT991A set to 25w (more of this later).

In initial set up it was found that we had considerable QRM coming from the commercial comms mast at the fort, this appeared to be related to paging. A Spectrum analyser was employed to look at the wider spectrum (perks of job) this identified 2 paging TXs 9Mhz higher than the operating freq of 144.3Mhz. The pagers were clean so the interference was put down to poor strong signal handling in the 991A the interference being exactly 9Mhz away, and 9Mhz being the second IF freq.....next time bring a radio with a traditional 13.5Mhz IF!!! Putting a 10db attenuator in the antenna socket of the 991A cleared the problem, but obviously dropped wanted sigs by 10db too...investigation into 2m band pass filters required.

Anyone new to VHF contesting, the exchange is simple and should flow....expect to send and receive information in this order. Sig report/serial ....the signal reports are REAL...not like HF! Locator (IO90LU), extra exchange info (in this case post code prefix) - PO. We were using a VHF logging program called Minos (free windows software) it seems very versatile with various scoring systems. Adrian G0WEJ.



Saturday the 31st July saw the restart of activity at Fort Widley with the RSGB 2 metre contest a pleasant day but a bit blowy. We erected the tent with just 2 walls this was sufficient to protect the ops from the weather. Most of the operating was done by Adrian Martin and Rod G0ERS, I did my bit but found vhf contests to be very information strong and unable to keep up with the demand of the contest. I'm just about competent at hf contests, signal report and serial number, Ralph 2E0HES



Set up 1200, ready by 1330. Contest started 1500 (all times local). Martin's beam (8 element). Adrian coax Heliax last used in 1999 for previous club entry in 2m low power contest. Push-up mast. FT991A rig 25w. Four of us put club marquee up and used two sides. Beaming North initially. To the West needed to avoid direct line to commercial antenna mast with multiple antennas a short distance away. Site visited by Rod G0ERS. QSO with M0CAA. Packed up at 1900 with 29 QSO's. Wx quite good, dry but windy (always is there). Club marquee and Battery power used.  
Stuart G0FYX

## Simon's Ramblings by GOIEY

The last 19 months has been interesting! The first Lock Down and subsequent ones, I was unable to get on with projects as I couldn't go out. This meant that continuation with projects at the Fort Widley site came to a standstill. The small project team consisting of Frank, Christine, Julia and myself were not able to meet as shielding was in operation because of our various ailments. The last check and small amount of progress there was during the time between lockdown 1 and 2.

I decided to carry on sorting my collection of components which has been an on and off event for a number of years. Purchased using the internet, quite a number of plastic boxes with clip on lids of various sizes to store components in. I did start to catalogue individual components but gave up when I reached about 2 million! That will be a task for another day or somebody else! At least types of component are in the same location now. Remembering where can still be an issue though!

I wish I could say that I had been busy in the shack, but not apart from sometimes turning up on a Club 2m Net. I must say at this point, that I thank the Club and Net Controllers for their dedication in running/organising them. It is a lot of commitment on their part. We couldn't physically meet so organising extra 'on air' meetings and 'zoom' ones was a brilliant way of looking after each other. It is a communication hobby, but it all takes organising.

I have been busy in the study (other end of shack), updating/re-organising the various levels of training Powerpoints. The 5th time of altering the Foundation and 2nd time of the Intermediate. I have left the Full one alone for now as that requires a more in depth review. I found that just having finished one update, I would notice on the RSGB web site and Tutors Forum that something else had changed.

Having had a relapse health wise during all of this and another shingles attack, I have not been as active as I would like. I find that I on average I am able to usefully function for a total of approximately 4 hrs spread around the waking hours.

Somebody asked me a while ago during lockdown are you bored? To which I answered I have never in my recollection ever been bored, frustrated yes (by being unable to complete something due to not having the correct item required for example), but never bored.

As an apprentice in the MOD(N), I was taught discipline, attention to detail and to perform the best operations that I was able to. They were paying me to learn and in future to produce responsibly for them whatever work they required.

Training discipline was run on the basis of the Royal Navy. Those three requirements have helped me through life (so far).

There was quite a list of deeds as an apprentice of punishable misdemeanours, some unwritten. The usual punishment was cutting up 4" diameter cast steel bar into  $\frac{3}{4}$ " lengths and coming into work early to do this task. . (I never did this). Eventually to be used for apprentice trade test jobs.

Turning up late for work by up to 15 minutes one was allowed to clock on but pay was docked. After 15 minutes one had to see the Chief Inspector and ask for permission to work.

The only time in my total of 5 years as an apprentice that I fell foul of discipline was when my car broke down in the dockyard and I was due at evening class at the Dockyard Technical College. I chose to get my car removed, as if left it stood a high risk of being pushed into a dock or the sea. I asked a fellow apprentice to inform the college why I wouldn't be at class.

Two days later I was asked to attend the Chief Inspectors Office immediately! He had been informed of my absence from college and required to know what excuse I had. Didn't I know I had to apply for leave at least 3 days before and get sanction for same on a particular form I can't now remember the number of?

I explained that I couldn't have completed the form as I didn't know my car would break down. Not acceptable. I had to fill said form out which was immediately refused as it was after the event. My father and I were summoned to attend a dressing down meeting because of the deeds of apprenticeship we had all signed. That was the last and only time that or similar happened!

It was a very good apprenticeship I was later told that it cost the MOD (tax payer) £5000 a year to train us. Which if you add on inflation, today I hate to think what that would be.

During all that time I learnt about every trade in the dockyard as well as specialising in electronics. I can still file flat, square and make fits to at least  $\frac{1}{2}$  a thou, (It takes much longer though). I still have all of my test jobs, one I did twice; it was called the C and H, the first as an Electrical Craft Apprentice and the second as an Electrical Technician Apprentice. The requirement that a half thousands of an inch feeler gauge could not be inserted anywhere between components parts and no light visible either when held up to a bright desk light, and fit 8 ways around with the same results. I had 2 weeks to achieve it. Some test jobs also if held a certain way must not slide apart.

I took an exam to become a Craft Apprentice (I came first in over 600 candidates that year so was able to become an Electrical one), and again to become an Electrical Technician Apprentice.

I achieved during the time as an apprentice firstly at the Dockyard Technical College and latterly at the Portsmouth University (the dockyard college having closed in my last year); Engineering Star (3 subjects), ONC, HNC, GCE English (required for the HNC as SCE grade 1 wasn't accepted for that.), some of which I took in 2 disciplines Mechanical and Electrical/Electronics, 100 words per minute speed reading and report writing on what I had read, Attended Management School for 1 month every year for 4 years and several active roles in management in various departments.

If one failed at any year at Technical College exams you were out and the same for Trade Exams. At the very least there would have been an enquiry based on one's achievements to date. During the last 4 years as a Technician Apprentice, I took every week a trade exam either written or oral, was required at a moment's notice to give lectures on a department I had worked in. It was all part of our training as Management Trouble Shooters.

To be able to be dropped in to a management role in any department in any Royal Navy Dockyard and have a working knowledge of what went on there. Technician Apprentices were designed to replace and did, do Student Apprentices who were required to be Good Managers but didn't have the hands-on tradesman's experience.



## ***Horndean & District A.R.C Information.***



**Club Call signs**    *G4FBS (Held by MØKTT); G6RST (Held by G4WQZ)*

**Club Website**     <http://www.hdarc.co.uk>  
*(Maintained by Neil 2E0LNX )*

**Club Groups.io site**    *Administrator is Stuart GØFYX*

**Club Facebook Page**    <https://www.facebook.com/hdarc1975/>

**Club Twitter Account**    @HorndeanARC

**Club Meetings**        *Held at Deverell Hall, 84 London Rd, Purbrook,  
Waterlooville, Hants. PO7 5JU, on the 1st and  
3rd Friday of each month. Commencing at 1900.*

**Club Nets**              ***All times are local and frequencies plus/minus QRM.***

**Sunday**                  *0900 CW until about 0930 then SSB on 1950 kHz.  
Net controller:- Stuart GØFYX*

*2000 FM 433.450 MHz  
Net controller:- John G4WQZ*

**Monday**                 *1930 SSB 1950kHz  
Net controller:- Stuart GØFYX*

**Wednesday**            *1930 FM 145.375 MHz  
Net controller:- John G4WQZ*

### **Club Membership**

***Joining fee £2 . Annual fee £26. Those aged 10-18 pay half this rate, and under 10's have free junior membership. For Europe and rest of the World fees please contact the Membership Secretary. All annual fees payable on November 1st. If fees not paid by the following January 31st, membership is ended.***

### **News**

The club Zoom meetings have now finished. Thank you to all who took part. Some interesting topics aired during the sessions.

### **Diary**

Friday August 6th Club meeting

Friday August 20th Club meeting

Friday September 3rd Club meeting

Friday September 17th Club meeting

Saturday/Sunday September 25th/26th GB4MHR from the Watercress Line  
(Mid-Hants railway) at Ropley station.

More details will be given in the weekly emails. Please remember to read them.

The AGM will be on Friday October 15th. Nomination form for officer/committee posts and also the nomination for the John Taylor-Cram scribe award will be sent out by email.

### **This 'n' that**

The autumn series of RSGB Club Championship contests starts on September 6th with SSB, followed by CW on the 15th, Data (RTTY/PSK) on the 23rd, and a FT4 contest on September 27th. Please take part if you are able. These are club events, and scores count towards the club tally.

All contests are on 80m from 2000-2130 local time.

For the rules and details see:

<https://www.rsgbcc.org/hf/rules/2021/r80mcc.shtml>

### **Amateur Radio Awards**

Many of you know that I am always chasing awards (as some others in the club do too). Whether it is IOTA Islands-On-The-Air, worked all zones, worked all continents, or DXCC (DX Century Club, worked at least 100 countries or entities). Most award certificates these days can be downloaded free as a PDF, unless you want a printed card certificate, but you will need to pay postage etc. Don't forget about the HDARC awards. Have a look at <https://www.hdarc.co.uk/info/> and scroll down for awards.

**We have a lot of items for sale.** Please visit the club website ([www.hdarc.co.uk](http://www.hdarc.co.uk)) and choose the For Sale tab.

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