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Cockenzie & Port Seton Amateur Radio Club is affiliated to the Radio Society of Great Britain and holds the call signs MM0CPS and GM2T which are used for our special event and contest entries.

The Club was formed by Bob Glasgow BEM GM4UYZ in 1984, to help the local amateurs get to know each other.

Far from being just a local club we have members regularly attending from the Borders, Dumfries, Strathclyde, Fife and Newcastle.

The Club meets on the first Friday of every month in the lounge of the Thorntree Inn on the old Cockenzie High Street from 7pm till late.



Editorial

June already who can believe that nearly six months of the year already gone. It is strange time with all our normal Club Activities, like Club Night all still cancelled face to face due to the Coronavirus I for one is certainly missing our club nights and all the banter, it is not the same is it having a regular ZOOM meeting but saying that it keeps us in touch, although there is now some light at the end of the tunnel and hopefully will all meet up again soon. For the next couple of months I am still going to continue with the ZOOM Club Nights.

What has happened since last month well we managed our first DF Night following the Covid guidelines. It was great catching up with those that came along and managing to have a bit of good old banter. One of the godsenders over the last year has been our Activity Week, I do look forward to our Activity week where we can select a day to operate. Fortunately, the last two months there have been contests running so for example this month I took part in the CQ -M contest on CW. This past one was the best with 17 people submitting logs so great to see people getting on the air and having a bit of fun, must admit it helped that 10M & 6M opened which certainly gave the encouragement. This brings me to our club events, so this month the cancelled April ZOOM talk by Simon Brown 2M00XH on "Large Scale

Software Defined Radar - A Practical View" will be given on Friday 18th June @ 19:00 via ZOOM

I have completed my first Full Licence Training via ZOOM and just waiting on them booking and sitting their exams. (2 will have done this by the time you read this editorial). I have also completed a Foundation Training Course and the individual has still to book his exam. I am now going to take a sabbatical before starting with an Intermediate Course via ZOOM at the end of August. If anyone is interested, then please get in touch ASAP as this helps me enormously.

To the future check out our events calendar (p.18) to see the current status, remember this is how it stands as I write this editorial and are subject to last minute change. See our website www.cpsarc.com and our Facebook page CPSARC for the latest updates.

VHF Field Day as I write this is going ahead and if you want to join us contact John MM0CCC mm0ccc@gmx.co.uk. It is a great event and a great contest. It is not as hectic as some HF contests and a great place to start and have loads of fun and banter.

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All being well, we will be back to normal in late October and will be taking part in CQWW SSB at Barns Ness Lighthouse, Dunbar.

As we have mentioned before unfortunately everything is now costing money and the most expensive is having to rent out the Lighthouse Buildings for CQWW SSB. If you would like to help with the costs of the hire, then we are still looking for donations for the CQWW SSB Weekend.

The link is:

<https://paypal.me/pools/campaign/112559925914904653>

-- CQWW SSB Contest

Not to forget those not interested in contesting well we still have our Club's Activity Day in June and every

month up to December so as you can see there is plenty scope for getting on the air one way or another.

Lastly, on behalf of the radio club, I would like to thank John MM0JXI and his wife Lisa for the wonderful donation that they have given to the club. It was extremely generous, and I am struggling to find the words on how to say other than thank you. The money along with a donation we received last year has been used to refresh the Club's Contest radios. We have purchased 4 x Yaesu FTDx101D's along with 4 brand new MyDel 30A PSU's. Again on behalf of us all many, many thanks.

That is it then enjoys the newsletter, and we will see you all once the Coronavirus lockdown is removed.

To you all and your families TAKE CARE and STAY SAFE

Bob GM4UYZ

International Museum Weekend NOW CANCELLED

Activity Day Report

May Activity Day – “YOUR” selected day between 9th to 15th May 2021 00:00 to 23:59

This was our fifth of 2021 where you can select your day to operate during the one-week selected period..... so reports below on who or who did not manage to take part.

Activity Day Rules and updated log sheet for 2021 have now changed and can be found using the following link:

<http://cpsarc.com/downloads/>

Look under Activity Days for the Downloadable files then you are all ready for the 2021 Activity Days. The 2021 files are as follows.

2021-ACTIVITY-DAY-LOGSHEET-V1.23

2021 New Monthly Activity Day Rules V5

Apologies first:

Julian MM0YTA

I still have not got around to setting up the antenna but will try to do so for next month.

Rafe MM0RPX

Sending my apologies this month for failing to participate. Activity week got away from me this month. Just extra busy with work.

Reports:

Bob GM4UYZ

The CQ-M contest coincided with the first day of the Activity week so decided to take part in that. I decided on CW on 20M only and managed to work 87 QSO's in the couple of hours I was on, all search and pounce I must admit. Worked a few Stateside and Asiatic Russia with the normal Europeans in between. Really enjoyed my operating this month

Duncan MM0GZZ

Bands are excellent at the moment I was on in the morning and a bit this evening, 6 was open for a good bit of Thursday and Friday nothing tonight Saturday though , but 10 has made up for it

Tom GM8MJV

EU 70Cms activity night - while waiting 6m opened up

Craig MM0NBW

It has been an interesting week on the bands with some sporadic e openings on the higher HF bands mixed in with a large geomagnetic storm. I managed to get on data modes, FT4 and FT8 on Monday and have

submitted that log. A few good DX to be had, including California – W7YA – 7997 Km, West coast of Canada – VE6CQ - 6542 Km, Oman – A45XR – 6116 Km, Asiatic Russia – R0QAF - 6249 Km and Japan – JH1IEG – 9166 Km and JA7FLI – 8551 Km.

I managed to grab some time on Thursday to get some SSB QSO's using my end fed antenna, which seems to work well on 10, despite being exceptionally low to the ground and suspended at one end from the attic skylight. Best distance wise on 10 was U4MIR just outside Moscow at 2504 Km. The callsign belongs to Alexander Volkov, Russian Cosmonaut, and veteran of 3 space flights, including to the MIR space station. Shortest was MM6RBX over in Glenrothes. A grand distance of 40 Km!

Martyn MM0XXW

Well what a difference from last month to say the least! 80 contacts all between 10 & 12m, nothing outstanding but super to see the higher bands opening.

Let us hope it continues for the next few months.

Bob MM0LBF

Must be feeling better today; following your advice - got on the air today and as you will see a few CW QSO's and some FT8.

Andy MM0GYG

Good to see the bands getting better. Two new DXCCs this week!

Jim MM0DXH

The May activity week was a good opportunity for me to test a cheap vertical (Sigma HF-360) that works on 10m to 80m, instead of the usual 10-15-20m beam I usually use, and of course a chance to try different bands. This resulted in several QSOs on 12m, 17m and 153 QSOs in total for that one day. Further to that I also tried "Teamviewer", which allows you remote operation of your PC from a tablet, perfect for FT8. This worked well and meant I could operate whilst in the living room with company. It is surprising what pops up from a basic operation. Whilst CQing and operating local European countries, OA4AI replied to my call and we successfully exchanged reports, Lima Peru was in the log at a distance of over 10,000kms on 12m

Brian M0RNR

Some good openings on 10m last week but 13th was by far the best day for me. Best DX was HZ1WTIS on FT8 10m for just over 5.1km

Keith MM0KTC

Log attached for this month.

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Ronan MM0IVR

I had originally planned to submit a magnificent SOTA log as Dot and I trudged round the boggy Moorfoot hills for six hours on Saturday the 15th and Blackhope Scar qualifies as a SOTA summit, albeit only a 2-pointer. Unfortunately, I had a complete brain-blank and forgot about the radio until we were right round the other side of the hills. I certainly was not going to squelch all the way back so that put pay to that idea. Colwyn's crown is safe for the time being..... Instead, I am using my log from Sunday the 9th of May as I had a bit of a play in the CQ-M contest using the 20m QCX Mini that I built a couple of days before. The result looks remarkably like last month's log and even has Jeff (TZ4AM) popping up again later. He seems to always work split and is kept pretty busy. 22 in the log from that day with Jeff being the greatest distance for me, followed by UN9LW in Kazakhstan.

Thomas M0THL

Log attached. My poorest yet - 10M being open really helped and was good fun but I was time poor and had other commitments this week which were not as entertaining as playing Radio!

Pete MM0INE

Just a couple this time but on 10m for a change. Activity still been sporadic, but I get on when I can. Usually when I collapse in the chair in my garage shack after doing something strenuous in the garden :) Looks like the bands are picking up a bit generally. Just had a QSO on 17m and 15 was open a couple of days ago. My doublet loads up nicely on the higher bands, but I think it performs better on the 40 - 160. I need to experiment a bit more with antennas for 20 - 10.

Geoff GM0LOD

A thousand and two grovelling apologies for not including my meagre contribution to the Activity Week for several months. Factor 1 is the state of my ears, or I should say, my hearing. Unless the received signal is S7 or better then it is a no, no, hence I never call CQ as I do not know the signal strength of the answering station. Factor 2 is my playing radio time, which is usually between 10.00 and 11.59 unless the Chancellor aka the Boss has other ideas, which does happen from time to time, as you probably have a similar excuse. Factor 3 is that the other station must speak English or something approximating. Factor 4 is my doublet which is only about 4m at the centre above the ground.

Last Friday there was a breakthrough, and I answered a CQ call from a guy in middle England with 5.9 in both

directions. What is more, he was also using an Icom 375. This is the first time that I have found another person using the same rig; I thought that I was the only one on the planet. Furthermore, he was also a G0, though he had qualified at 21, whereas I had come to the hobby relative late in life at 54. Anyway, it was a good old rag chew and one of the best QSOs in ages.

James MM0LQF

My May log - Annoyingly, most of my activity was not in the activity period! Been doing a bunch of 6m and 10m more recently, the new radio is also working well.

George MM0JNL (GB0ME)

My activity day log for 11/05/2021. All FT8 as that was my best option and also has my best distances to date.

Colwyn MM0YCJ

Complete log for your attention. I am just about to set sail from Inverness for 4 days and no internet access hereafter.

I was on The Brack, above Loch Long on Saturday morning and managed 12 VHF contacts. Bit damp on top but VX7 and 2 element beam got as far as Blencathra in the lake district.

The Brack, GM/SS-040. 787m. Coordinates: 56.1882, -4.8281. Locator: IO76oe

Summary

DATA is the winning mode this month with 396 QSO's. Next best was CW with 113 QSO's. Out of the 556 QSO's being made: CW = 113, SSB = 35, DATA = 396, FM = 12, AM = 0.

This month a huge flurry of QSO's on the high end of HF opening up i.e. 24MHz, 28MHz plus even 50MHz busy as well. Hope this is the start of better propagation to come.

Best HF DX on DATA was by Keith MM0KTC working E51JD) on 14Mhz at 15708kms into the Cook Islands in the Pacific (nice one!!!) best CW QSO's this month was by Bob GM4UYZ working K2ZW at 8221kms into the USA and on SSB the best DX was by Keith MM0KTC working ZL4RMF on 7MHz at 18923Kms into New Zealand

Nice to see a mixture FT4 and FT8 being used on DATA with FT8 the leading mode this month with 347 QSO's, next FT4 with 49 QSO's.

QSO's to report on VHF and UHF and upwards were on DATA by Tom GM8MJV working E73S at 2111Kms into Bosnia and on FM by Colwyn MM0YCJ/P out in the Brack, Loch Long on 144MHz. Best DX was by working GM3PSP at 127kms in Edinburgh

A superb turnout out this month with a total of 17
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people taking part. With this Coronavirus still about it gives you a great opportunity to play at radio. Keep it up folks..... Thanks to everyone for your log they are so much appreciated.

The next Activity Day is any day starting on the week beginning the 13th and ending on the 19th June 2021 the fifth for 2021. Remember to use the new recording spreadsheet for your logs **2021-ACTIVITY-DAY-LOGSHEET-V1.23.xlsx** (updated on 16/6/2020) which can be downloaded from the website.

Summary of who did what:

Total QSO's = 556 where: CW = 113, SSB = 35, DATA = 396, FM = 12, AM = 0

Bob GM4UZY CW: 87 x 20M
Duncan MM0GZZ DATA: 8 x 20M, 5 x 10M
Tom GM8MJV DATA: 24 x 6M, 13 x 70cms
Craig MM0NBW DATA: 41 x 20M, 4 x 17M
Martyn MM0XXW SSB: 14 x 20M
DATA: 36 x 12M, 30 x 10M
Bob MM0LBF CW: 4 x 20M
DATA: 12 x 20M
Colwyn MM0YJC FM: 12 x 2M
Andy MM0GYG DATA: 8 x 17M
Jim MM0DXH DATA: 4 x 40M, 5 x 20M,
1 x 15M, 62 x 12M, 73 x 10M
Ronan MM0IVR CW: 2 x 40, 19 x 20m, 1 x 15M
Brian M0RNR DATA: 4 x 12M, 27 x 10M
SSB: 12 x 10M
Keith MM0KTC SSB: 1 x 40M, 5 x 20M,
1 x 17M
Thomas MM0THL DATA: 1 x 20M, 2 x 17M,
6 x 10M
Pete MM0INE SSB: 2 x 10M
Geoff GM0LOD SSB: 1 x 40M
James MM0LQF DATA: 13 x 40M
George MM0JNL (GB0ME)
DATA: 1 x 20M, 1 x 17M,
4 x 15M, 9 x 10M

DATES FOR YOUR DIARY FOR THE 2021 ACTIVITY WEEKS

<u>MONTH 2021</u>	<u>ACTIVITY WEEK</u>
June	13th to 19th June 2021
July	11th to 17th July 2021
August	8th to 14th August 2021
September	5th to 11th September
October	10th to 16th October
November	7th to 13th November
December	12th to 18th December

Thanks for taking part in the activity day week and I hope you will continue to do so in 2021. The dates for the 2021 are now set, see the above table so would love to see many more on as well so why not make it your 2021 target., there is nothing else to do with the Coronavirus restrictions in place.

Bob GM4UZY

THE LEFT-HANDED CAPACITOR TROPHY

Back to 2009, we ran a challenge as part of our 25 Years Club Anniversary. As part of this challenge, a trophy, "Left-Handed Capacitor Trophy" in memory of Vic GM4GGF was awarded to the winner of the Foundation Licence holder with the "most Distant QSO". Martyn MM0XXW, then MM3XXW won this.

Another challenge where the trophy could be once more presented, but this time on an annual basis was created in 2011. The idea that came up trumps, (thanks Cambell MM0DXC), is to present it to the person who

Entrants must operate at the Radio Events run by the club over the specific year period. Normal events that the club participates in each year are the Port Seton Gala Day (MM0CPS) (Not 2020), National Mining Museum (GB2NMM), Lighthouse Weekend (GB2LBN) (Due to the Coronavirus these are cancelled) and the Club's Activity Days. There may be others depending on requests and these will also be included.

Win-Test Logging software will be used to create our log at all Club External events but not during Club Activity Days as individuals will be using their own logging software

After an event, the log will be checked and the number of QSO's made by each operator will be counted and recorded.

Club's Activity Days: Total number of QSO's made from the submitted log will be extracted and added to the overall running totals.

After the completion of the year period each operator's totals for each event will be totalled and the operator with the most QSO's will be deemed the winner.

The trophy will then be presented to the winner who can retain it for a year before returning it to the club.

RESULTS FOR THE 1st JANUARY 2020 to 30th APRIL 2021

I have now just adjudicated the VIC Trophy results that ended on the 30th April 2021 and can announce the winner is Rafe Pilling MM0RPX/2M0RPX/MM7RPX. He receives a certificate and the Trophy for a year (assuming we can do a presentation). Congratulations Rafe well done



has been licensed for up to one year and makes the greatest number of QSO's during our Club Radio Events. The aim is to encourage newer operators to "operate" and help overcome any microphone hesitancy.

Criteria:

The challenge runs from the 1st May through to 30th April of the next year.

Those taking part must have obtained their Foundation Licence within the previous year (Starting 1st January of that Year i.e. For the 2019-2020 year then obtained their Foundation licence in that period), even though at the time of taking part may have obtained their Intermediate or even Advanced Licence.

The CPSARC Training year will run from the 1st May through to the 30th April. This covers the club's August to April training program

Entrants must be able to identify that they obtained their Foundation Licence at some time during the stipulated year dates, either by (1) or (2) above.

Entrants need not have been trained by the Club for all the three licences but must have at least obtained one of them via the Club's training program.



DF HUNT NIGHT Friday 14th May

Our DF Nights are now an integral part of our club events where we run one in May and the other in September. Each DF night has its own characteristics, otherwise the May night is in total daylight and the September night is 80% in the dark... No matter what they both offer some interesting challenges. Sadly in 2020 we were not able to run the events due to the Corona Virus, thankfully some of the virus restrictions have been lifted which has allowed our 2021 May event to take place.

Our first DF night the weather was good and sunny, great to see as earlier in the week the weather was not what one would say genuinely nice. The fox this time was Rickie GM1PLY. Like the other previous foxes a notification was sent to inform Rickie that there were 5 cars involved, would have been nice to see more but nevertheless a turnout for this event maybe next time more will come out and take part.

Well 4 teams that took part this time assembled at the new car park location where the Pond Hall and swimming pool used to be. The 5th car started in North Berwick due to the time that he finished his work. The teams consisted of Cephass MM0INS in Car 1, Robin MM0VTV and Paul MM0VPR in car 2, Julian MM0YTA and his son James in car 3, Craig MM0NBW in Car 4, and Liz 2M1GLD and me in car 5. All the teams for this DF Hunt used a 2-element beam. Over the years a lot of people have really enjoyed taking part but alas you all seem to be missing.....it would be great to see all your support and return to make what is a really big fun event.

At the pre-requisite time of the 19:00 start we all went our separate ways to try and catch the elusive fox. Liz and I headed along the middle road towards North Berwick making our first stop at Spittal, where we took our first bearings getting no signals at all. We then made our way up to towards the Garleton Monument and as we got near the "squelch" broke on the radio and that was with the aerial lying in the boot of the car. Instinct took over and we both said he is very near. We then turned to head for our Garleton stop and as we approached the turning in to the Garleton

Monument Car Park we thought we would just do a check....BINGO Ricky was there well tucked in. Liz and I just could not believe our luck. Sometimes it happens just like that and it certainly was for us. We then headed off back to where we started to await hopefully the others returning.

On finding the Fox Ricky said that we were first at 19:15. Yippee

We have always said when DF'ing that luck sometimes plays an enormous part in the hunt and that night it was with most of us.

How did the others fare was the question well they all found the fox within 5 minutes of each other so well done to them all? Congratulations to Liz and me at the 19:15 then Craig was at 19:20 and Paul and Robin at 19:25. Sadly Cephass and Julian and his son James did not find the Fox although speaking later both cars had been seen going past more than once but had not made the turn into the car park.

The trophy was not presented and will be kept with me until the next DF Night in September

A massive thank you from us all to Rickie for taking on the role of the fox and once again producing another fun packed night. Also, thanks to everyone who turned up I know from all your comments you all seemed to enjoy it so hopefully you will all come back for the next DF night in September 2021, Covid permitting.

Those of you who do not take part you do not know what you are missing. Believe you me DF'ing is not as easy as you think, give it a try and you will see what I mean.

Congratulations again to Liz and me for winning and commiserations to the rest...

Bob GM4UYZ

STACKING TRIBAND YAGI'S

STACKING TRIBAND YAGI'S AND PHASING VERTICALS WITH UNUN TRANSMISSION LINE TRANSFORMERS

BY Colin Brown GM0RLZ

The article below was written by Colin one of our Club Members. Colin's interests lie with antennas and antenna designs. With the Advanced (Full) Training Course just completed I thought a re-run of this article would be of interest to the students as well as anyone else who may be interested.

UNUN (unbalanced-to-unbalanced transformers) belong to a class of matching devices known as transmission line transformers. They are unbalanced, wideband and a flexible impedance transformer. When properly designed, they can have extremely high efficiencies and very broad bandwidths. Another feature is that even high power UNUN's are small and do not require careful cutting of various lengths of coax.

Since their transformation ratios hold true over a large frequency range, it is now possible to stack tribanders, log periodics, multiband quads or even multiband verticals and dipoles. Now you don't have to be a Big Gun to have a stack of antennas. This is probably the most effective upgrade you could do to your station, even better than buying the latest mongo 8 kilowatt Yugoslavian amplifier (2x gu84b) I saw advertised recently. You also have the added ability of beaming in 2 directions at the same time, control of the take off angle and able to suppress rain static/local noise.

Dr Jerry Sevick W2FMI and Jay Terleski WX0B are credited with leading the field of UNUN design and their use in stacking antennas. Jay Terleski is the owner of Array Solutions and a keen contestor. Jay was looking for a way to build a single tower, Multioperator contest station. He wanted to feed equal power to either 1, 2 or 3 stacked yagi's and be able to switch them into any configuration of upper, middle, lower, upper two, lower two and upper and lower. After searching all the available literature he found no easy to build solution to this problem. What he realised was he was searching for a gadget that could transform impedances. He had seen W2FMI Jerry Sevick's book Transmission line transformers and it dawned on him that a UNUN was just what he was looking for.

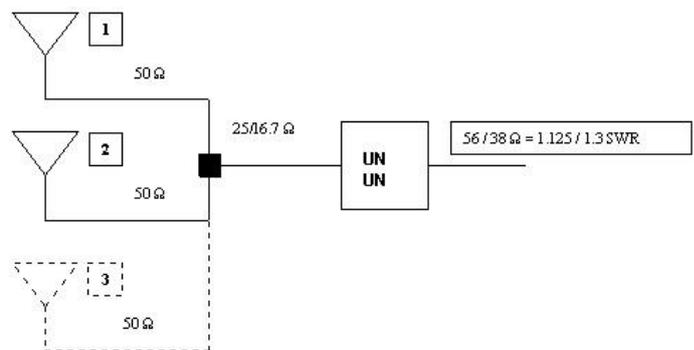
The classic way to feed a two high stack of yagis is to

use quarter wavelength, 75 ohm coax transformers. If the stack is to be made switchable, these sections have to be switched out. To switch all these cables in or out for 2 or 3 antennas calls for a very complicated switching matrix. The other disadvantages are that this system requires accurate cutting of transmission lines and it only works on one frequency.

The UNUN system (Stack Matcher)

When we feed three 50 ohm antennas with equal lengths of coax, the total impedance is 16.7 ohms. Two 50 ohm antennas with equal lengths of coax give us a total impedance of 25 ohms. We could build two UNUN's one with a 3:1 ratio to feed 3 beams and one with a 2:1 ratio for 2 beams. But if we were to compromise and build a UNUN with an intermediate turn's ratio 2.25:1 we can still achieve a 1:1 SWR see Figure 1.

FIG 1.



2.25:1 UNUN's are very easy to build; they don't require any taps and can be made to handle high power. There is a trade off between bandwidth, number of turns required and core permeability. Jay reports that there is also a small trade off between permeability and efficiency, but the efficiencies are so high that ferrite cores with a 125 permeability or lower will give nearly 100% efficiencies at HF frequencies. The windings are trifler of high voltage wire 12 or 14 gauge wire. Wrap five turns round the core and bend the ends to make connections as in fig 2.

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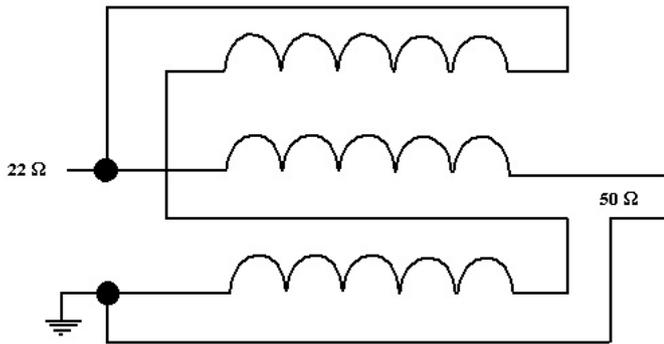


FIG 2.

Once the UNUN has been constructed check it by putting a 25 or 16.7 ohms dummy load across it, paralleling 2 or 3, 50ohm dummy loads, works fine. When I constructed my first UNUN I used 2 x 1.5kw loads in parallel and was able to run the full output of my Alpha 91B into the unit without any heating in the core so I would reckon that this UNUN would handle that Yugoslavian Amplifier!

It's a good idea to wrap some fibreglass tape round the core to prevent damaging the enamelled wire. I used an AB240 balun kit available from Bytemark, it consists of a FT240-61 core and 14 gauge enamelled wire, power handling 2KW CW. An F114-67 ferrite core could also be used. I used Finder single pole 16 amp 12volt PCB mounting relays see E17BA's web site for further information on using these relays for antenna switching. A simple rotary switch and diode matrix selects each array combination. A good waterproof enclosure is all that is needed to mount the UNUN match outside. I will leave it to the individual how they switch the relays.

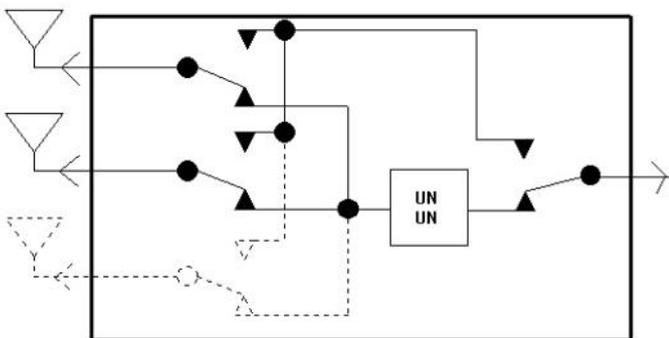


FIG 3.

Other Uses

The UNUN match does not just have to be used with YAGI beams; it can also be used to phase vertical anten-

nas. It can be set up to feed 2 or 3 verticals in phase giving broadside pattern when spaced properly and an end fire array in each direction when each antenna is selected individually. It is also possible to set 3 verticals up in a triangle.

Erect the two verticals so that the broadside patterns and end-fire patterns are oriented in the desired direction. Space the verticals from $\frac{1}{4}$ wave apart to $\frac{1}{2}$ wave apart. If you are using three verticals erect them in a triangular pattern with 0.145 to 0.25 separation. Model your antennas to verify the pattern you are seeking is correct. Remember these verticals could be vertical dipoles hung from your existing tower. Connect two feed lines, which are 0.41 wavelengths long at the desired band of operation. Remember to take the feed line velocity factor (VF) in mind when constructing them.

By feeding equal power to the two verticals you will achieve a broadside pattern. By selecting antenna 1, antenna 2 or antenna 3 (if in a three element array) you will have created an end-fire pattern in the direction of that antenna. The un-selected antenna(s) become a reflector due to the effects of the feed line stub. You will see 4.0 dB gain over a single vertical if the spacing is $\frac{1}{2}$ wavelength between verticals. For $\frac{3}{8}$ wave spacing the gain will be 2.4 dB over a single vertical. For The End-Fire mode you will see from 3dB to 6 dB gain depending on spacing.

It is a good idea to model this array to determine the gain and pattern for the spacing you have chosen. Just use +j 65 to +j100 ohms as your "load" placed at the feed point of the verticals. The 65-100 ohms of +j impedance is what you will see from the stub when that antenna becomes a reflector. This is like adding a coil to the feed point to lower the resonant frequency of the vertical by 4-6 %. You will also see the pattern is very forgiving and will provide useful gain over the entire range.

Example of a 3 element array: To make a simple 3 element triangular array. Build three vertical dipoles and mount them from the same tower. Pull the middle sections away from the tower and fold the bottom ends back into the tower. Space the dipoles as you would your guy lines, 120 degrees apart. Feed as dipoles from the UNUN match, mounted half way up to the tops of the dipoles. This makes a very effective array (3dB gain, 15-20dB front to back).

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FIG 4.

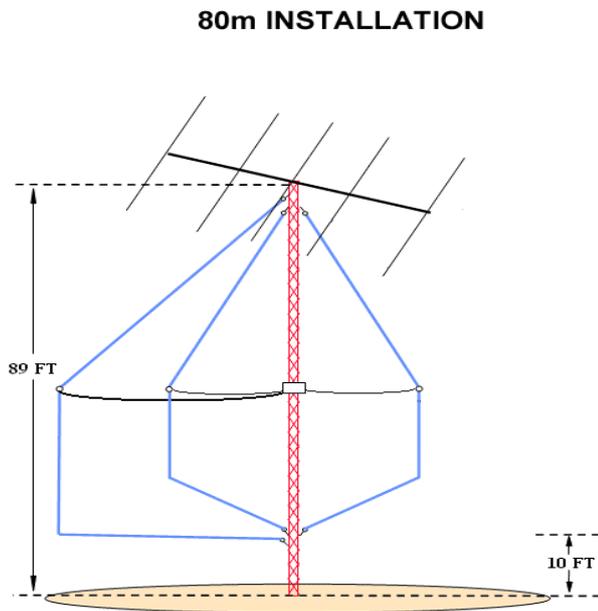
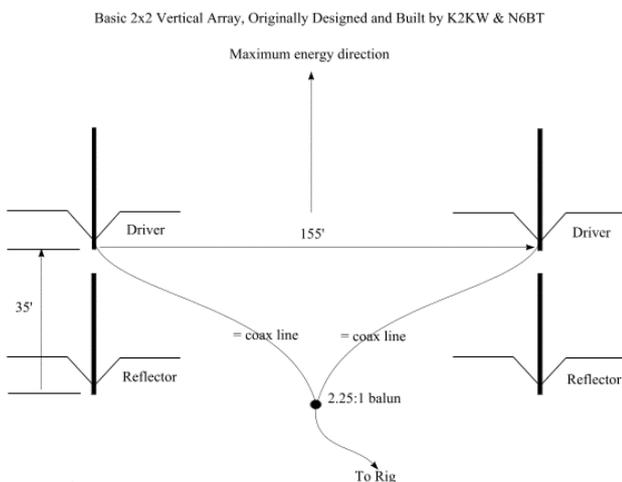


FIG 5.



The array above was built and tested and found to be equal to a full sized 3-element beam. The disadvantage is that it is fixed in one direction. Antennas are force12 linear loaded 80m verticals. Similar vertical arrays have been used by Team vertical from Jamaica to win CQWW CW contest.

A full description is available from <http://force12inc.com/PCSDAT-002.htm>

I have concentrated on 80m antennas but remember the UNUN match will work from 1.8-30 MHz so get planning those 160m phased verticals you have al-

ways promised yourself. Talking of 160m antennas a 2:2.25 UNUN is a great way to feed an inverted L, normal feed point is around 18-28 ohms depending on the ground system used. With a little ingenuity on your part multiband verticals could be phased with a compromise on spacing. The average tower would probably be able to support a pair of vertical dipoles for 30/40m. My only other bit of advice is be careful phasing antennas with a slaved driver i.e. Force 12 C3s etc, with a direct feed YAGI gamma match, hair-pin etc. There are articles on the Array Solutions web site, which describe how to phase different yagi's like these. At my own QTH I played around phasing a Butternut HF9 vertical with a Cobweb nest of dipoles and found it significantly reduced local noise. Have fun and join the Big Guns!

References and Links

ARRL Antenna Handbook 19th Edition

BYTEMARK : http://www.bytemark.com/products/kit_bal1.htm

E17BA website: <http://www.iol.ie/~bravo/>

FORCE 12: <http://force12inc.com/>

I4LEC Website: <http://www.qsl.net/i4lec/>

W2FMI Jerry Sevick Transmission Line Transformers, 4th. Ed

W4RNL website: <http://www.cebik.com/radio.html>

WBOX Array Solutions: <http://www.arrayolutions.com/>

WBOX Jay Terleski: A Single Tower, Multioperator Contest Station, National Contest Journal 95. Jul/Aug

CONTEST CALENDAR

For anyone interested in contesting there is something for everyone. Contesting is not just about winning although that is the aim; it is about taking part, having some fun, honing your operating skills, helping you understand propagation and It is also a good opportunity to test out your station at home to see how it is performing.

Happy Contesting.....

**** PLEASE NOTE THAT DUE TO THE CORONAVIRUS SOME CONTESTS MAY NOT HAPPEN OR COULD BE RESTRICTED IN NATURE i.e. NO MULTI-MULTI STATIONS ****

Extracts are from the RSGB Radio Sport VHF & HF contest and the WA7BNM Contest Calendar

(<http://www.hornucopia.com/contestcal/perpetualcal.php>)

June 2021

VHF-UHF FT8 Activity 144MHz	1700Z-2100Z, Jun 2
10-10 Int. Open Season PSK Contest	0000Z, Jun 5 to 2359Z, Jun 6
VK Shires Contest	0000Z-2359Z, Jun 5
Wake-Up! QRP Sprint	0600Z-0800Z, Jun 5
Tisza Cup CW Contest	1200Z, Jun 5 to 1159Z, Jun 6
RSGB 80M CC DATA	1900Z-2030Z, Jun 7
ARS Spartan Sprint	0100Z-0300Z, Jun 8
VHF-UHF FT8 Activity 432MHz	1700Z-2100Z, Jun 9
Asia-Pacific Sprint, SSB	1100Z-1300Z, Jun 12
SKCC Weekend Sprintathon	1200Z, Jun 12 to 2359Z, Jun 13
Portugal Day Contest	1200Z, Jun 12 to 1200Z, Jun 13
AGCW VHF/UHF Contest	1400Z-1800Z, Jun 12
GACW WWSA CW DX Contest	1500Z, Jun 12 to 1500Z, Jun 13
REF DDFM 6m Contest	1600Z, Jun 12 to 1600Z, Jun 13
ARRL June VHF Contest	1800Z, Jun 12 to 0259Z, Jun 14
RSGB 2 nd 144MHz Backpackers	0900Z-1300Z, Jun 13
4 States QRP Group Second Sunday Sprint	0000Z-0200Z, Jun 14
RSGB 80M CC CW	1900Z-2030Z, Jun 16
All Asian DX Contest, CW	0000Z, Jun 19 to 2359Z, Jun 20
RSGB 50MHz Trophy	1400Z, Jun 19 to 1400Z, Jun 20
Stew Perry Topband Challenge	1500Z, Jun 19 to 1500Z, Jun 20
West Virginia QSO Party	1600Z, Jun 19 to 0400Z, Jun 20
ARRL Kids Day	1800Z-2359Z, Jun 19
Run for the Bacon QRP Contest	2300Z, Jun 20 to 0100Z, Jun 21
SKCC Sprint	0000Z-0200Z, Jun 23
RSGB 80M CC SSB	1900Z-2030Z, Jun 24
Ukrainian DX DIGI Contest	1200Z, Jun 26 to 1200Z, Jun 27
His Maj. King of Spain Contest, SSB	1200Z, Jun 26 to 1200Z, Jun 27
ARRL Field Day	1800Z, Jun 26 to 2100Z, Jun 27
RSGB 50MHz Contest CW	0900Z-1200Z, Jun 27
RSGB 70MHz Cumulatives #4	1400Z-1600Z, Jun 27
RSGB FT4 Contest	1900Z-2030Z, Jun 28

HF Propagation Prediction

HF Propagation Prediction June 2021

Summary

Best chance of DX – Asia and Americas using CW/Data on 40, 30 and 20 metres during most periods.

Best SSB phone DX – 40 meters during darkness and 20 metres during daylight Asia, Africa and Americas.

Best inter G SSB phone QSO's are, as expected on 80 metres throughout the 24 hours. Some possible on 20 and 40 metres.

12 and 10 metres are predicted to be closed, but possible SSB late morning to early evening, with CW/Data a couple of hours either side of these times. Recent sporadic E activity has been evident on these bands, with activity extending into the later evening for CW and data modes.

Long Term Solar Summary – May 2021

Solar Cycle 25 has officially started. Cycle 24 reached minimum in December 2019 and peaked in April 2014 with a peak average of 82 sunspots. Solar Cycle 25 is predicted to have a slow start and anticipated to reach maximum between 2023 and 2026. Consensus is that it will peak in July 2025 (plus/minus 8 months). Solar Flux (SFI) is predicted to tip over 100 in January 2023.

Cycle 25 is predicted to be similar to Cycle 24 with a

ter spots and your own ears!

Modelled on 100W SSB – Dipole at 15 ft. All times UTC.

80 Metres - 3.5 MHz

00:00 – 07:00	SSB QSO's Inter G, Ireland and Northern/Central Europe and Baltics. CW/Data modes may be possible to North Africa and eastern Canada/USA
07:00 – 17:00	SSB QSO's limited to a couple of hundred miles. CW/Data modes may reach Northern Europe, picking up around 15:00.
17:00 – 23:00	SSB conditions build with good inter G and Northern Europe. Baltics and eastern Canada/USA may be possible later in the evening.

weak peak activity – 95 to 130 sunspots, which is below average of 140 to 220 sunspots.

Sunspots and Propagation

Frequencies above 15 MHz (17 metres amateur band and shorter) will open sporadically. 40m is more likely to stay open all night and should produce good DX.

Best DX is likely to be on 20 metres at all times. As solar activity picks up, this will lead to more D layer absorption, weakening 160, 80 and to some extent 40 through daylight hours.

Usual caveats apply; This information is a broad summary from a number of sources using models based on historical and predicted data using ideal antennas with some allowances made for location, QRM and QRN. Band conditions fluctuate constantly and may improve or deteriorate at any time. Predictions are short-path propagation.

SSB predictions are based on combined path reliability (REL) and S/N ratio predictions above 65%. CW/Data combined REL and S/N ratio above 35%. Modelled on 100W SSB – Dipole at 15 ft. Your equipment may be more or less efficient than the model which will negatively or positively impact real results.

Unpredicted QSO's are always possible, so use this information as a guide only, in conjunction with DX Clus-

(Continued from page 12)

40 metres - 7 MHz

00:00 – 07:00	SSB QSO's in Northern Europe, North Africa, Baltics and European Russia. Eastern Canada, eastern USA possible. CW/Data modes may be possible to, South and Central America and USA.
07:00 – 17:00	SSB reducing to Europe and inter G as the day progresses. CW/Data modes possible into north Africa, south America, and Eastern USA, but diminished by mid morning.
17:00 – 23:00	Early evening sees SSB in Europe, north Africa, Eastern Canada, European Russia and inter G, building westwards as the evening progresses. CW/Data modes to North and South America and north Africa, possibly into Asia

30 Metres - 10 MHz – CW & Data only

00:00 – 07:00	CW/Data modes good to southern Europe, Central and South Africa, and across the Americas. Possible openings to Asia.
07:00 – 17:00	CW and Data modes good throughout Europe, North Africa and Central America.
17:00 – 23:00	CW/Data modes good through Europe and Africa. Possibility of India, Asia, Antarctica and western Australia around 20:00.

20 Metres - 14 MHz

00:00 – 07:00	Midnight until around 02:00 SSB good to southern Europe, Greenland, North Africa and South America. Diminishes until around 04:00, building again with southern Europe, Africa and parts of western Asia possible.
07:00 – 17:00	SSB good into central and southern Europe, Greenland and Baltic states, North/Central Africa and South America mid morning. SSB may be possible into east Asia and USA late afternoon. CW/Data modes into Africa and south and central America, Australia, Asia, Japan, China, India, Western Australia, New Zealand and USA.
17:00 – 23:00	Early evening sees SSB in Europe, Africa, Arabian peninsula Asia, moving westwards to South America around 17:00 Early evening also sees CW/Data possible to east Asia, Africa and south America.

17 Metres - 18 MHz

00:00 – 07:00	Band effectively closed until around 05:00 with SSB possible north and south Africa. CW/Data possible to India, western Asia and Australia.
07:00 – 17:00	SSB possible to southern Europe, South America and Africa. CW Data modes possible to Australia, Indonesia, India and Antarctica.
17:00 – 23:00	SSB good to southern Europe, Africa and South America, diminishing around midnight.

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15 Metres - 21 MHz

00:00 – 07:00	Poor conditions - Band effectively closed.
07:00 – 17:00	SSB to Europe and southern Africa and South Atlantic/South America later in the period. CW/Data possible to Asia and South Atlantic.
17:00 – 23:00	SSB to, Southern Europe, West and South Africa, South Atlantic/South America until around 22:00 when band effectively closes.

12 Metres - 24 MHz

00:00 – 07:00	Poor conditions - Band closed.
07:00 – 17:00	Poor conditions - Band closed.
17:00 – 23:00	Possible SSB, CW/data to South Africa, and South America –between 19:00 and around 22:00

10 Metres - 28 MHz

00:00 – 07:00	Poor conditions - Band closed.
07:00 – 17:00	Poor conditions - Band closed.
17:00 – 23:00	Poor conditions - Band closed.

Data from

Prop Charts

<http://infotechcomms.net/propcharts>

VOACAP Online

<http://www.voacap.com/hf/>

ITURHFProp

<http://www.predtest.uk/index.html>

Solar Cycle

[https://www.weather.gov/news/190504-sun-activity-in-solar-cycle?](https://www.weather.gov/news/190504-sun-activity-in-solar-cycle?fbclid=IwAR1rG9yCltKzY8xnQzDbvms66ErvmjTLIGwcYoFBndv_C_Dae2soy1osQE8)

[fbclid=IwAR1rG9yCltKzY8xnQzDbvms66ErvmjTLIGwcYoFBndv_C_Dae2soy1osQE8](https://www.weather.gov/news/190504-sun-activity-in-solar-cycle?fbclid=IwAR1rG9yCltKzY8xnQzDbvms66ErvmjTLIGwcYoFBndv_C_Dae2soy1osQE8)

<https://www.swpc.noaa.gov/>

Sunspot Watch

<http://prop.hfradio.org/>

Networking Fundamentals

The following article came about when someone asked a question on what is Simplex with regard to signals being transmitted. What I thought I would add is the description for some of the other terminology used in networking. Hope you find it of some interest.

Data Transmission Terminology

Communication Modes

Simplex - One-way transmission only for example a radio or TV transmission

Half Duplex – Data transmission in one direction at a time for example speech, we listen while the other person speaks and then we speak while they listen.

Full Duplex – Data transmission in both directions at once.

Transmission Modes

Asynchronous – Sometimes called Stop Start

Each byte transmitted is preceded with a start bit and usually ended with one stop bit, giving a transmitted length of 10 bits. Asynchronous settings are described by three digits, these define the number of data bits, the parity and the number of stop bits e.g.

8N1 8 Data Bits, No Parity, 1 stop bit

7E1 7 Data Bits, Even Parity, 1 stop bit

Synchronous –

In a synchronous transmission data is formed into frames consisting of many bytes possibly preceded by synchronising characters and destination and source addresses. Where modems use synchronous transmission the data needs a clock signal to be provided, usually by a modem. The standard RS232 port in a PC is not able to use these clocks and therefore cannot transmit or receive synchronous data. However synchronous data transfer is extensively used in other applications.

Connection/Connectionless data transfer

When we make a telephone call we first establish a connection with the person we wish to speak to and then we have a conversation. When we send a letter no connection is made we address the letter, send it and assume the data will reach its destination.

Flow Control

Flow control is data-flow management, e.g. the serial port can usually transmit data at a higher speed than a printer, for example, can print the information. The result can be that data is lost when the peripheral buffer overflows. Flow control enables the peripheral to inform the PC that its buffer is almost full and the PC will stop data output. When the peripheral buffer is almost empty the peripheral will inform the PC and the data flow will recommence.

There are two types of flow control, hardware and software. Software flow control can be known as X-on X-off. Make sure that both the PC and the peripheral are using the same type of flow control.

Error Control - Parity and CRC

Byte Parity

For many applications it is important to ensure that the data received is identical to the data sent. Parity is used to check the integrity of received data.

Byte parity uses an extra bit on each byte to maintain the total number of bits set to "1" as either an odd or even number. If the parity being used is odd for example and the receiving station receives a byte of 10110010, which has an even number of bits equal to 1 the byte would be rejected.

For some data transmissions the ASCII code is used (covered later). ASCII data is transmitted in only 7 data bits and bit eight can be used for parity. Both ends must be set to use the same parity, odd even or none.

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Block Parity/CRC

Byte parity is limited; should a byte be received where two bits have been dropped or gained then the byte will be accepted as good. Where bytes of data are formed into blocks or frames of data for transmission, a check sum is usually calculated and written to the end of the block. The receiving device will perform the same calculation and compare the figure it has calculated with the BCC. The two figures should be equal otherwise the data frame will be rejected.

The terms Cyclic Redundancy Check and Frame Check Sequence are also used to describe the end of block check.

Parallel to Serial

While data buses inside a computer are one or more bytes wide, most networks carry only one data bit at a time. Therefore there has to be parallel to serial conversion for data transmission.

Multiplexing

Multiplexing is the principle of combining the traffic from a number of low speed sources onto a high-speed trunk. At the remote end the traffic is de-multiplexed and passed to the correct end user.

Telephone and data circuits are multiplexed together for transmission along a single trunk. When we make a telephone call or a data connection via BT or another service provider we are allocated a virtual circuit on a trunk that we may share with several thousand other users.

Multiplexers, where several low speed terminals are connected via a single high speed line to a second multiplexer and then the server were common until recently, but have been largely replaced by distributed LANs

CLUBLOG TABLES

Gordon MM0GPZ climbs back into the lead with 169 DXCC followed by Duncan MM0GZZ and Jim MM0DXH.

To add your log to the table, sign up at clublog.org, upload your log and request to join the CPSARC club (club members only please)

John MM0JXI

Rank	Callsign	160	80	60	40	30	20	17	15	12	10	6 DXCC	Slots	Range
1	MM0GPZ	0	56	0	78	42	113	46	40	22	33	37	169	467 16 yrs
2	MM0GZZ	0	0	0	80	54	105	85	0	0	30	34	138	388 13 yrs
3	MM0DXH	0	9	0	38	0	122	14	62	23	32	0	131	300 18 yrs
4	MM0XAB	0	12	0	33	10	61	7	1	0	2	2	106	128 7 yrs
5	M0RNR	0	14	32	33	1	50	5	31	10	35	1	85	212 22 yrs
6	MM2N	0	50	0	59	0	51	0	15	0	1	0	81	176 9 yrs
7	MM0XXW	0	15	0	39	18	49	23	16	28	26	6	69	220 15 yrs
8	MM0NBW	1	12	0	21	0	51	8	7	5	17	0	58	122 4 yrs
9	GM4UYZ	0	5	0	21	0	46	0	4	0	9	0	56	85 41 yrs
10	MM0GYG	4	9	0	10	28	15	22	12	5	14	4	52	123 12 yrs
11	GM8MJV	0	4	0	19	0	6	0	0	0	0	23	33	52 43 yrs

TEST YOUR KNOWLEDGE

1. **A balun is**
 - a. used instead of a dummy load
 - b. used to connect a dipole to coaxial cable
 - c. a particular type of antenna
 - d. A type of feeder.
2. **Two receiving stations are situated on clear open ground 5km and 10km from a VHF transmitter. The further station will**
 - a. receive a weaker signal because the signal has spread out more
 - b. receive the same signal because they are both in clear ground
 - c. receive no signal if it is directly behind the closer station
 - d. Only receive a signal if it is correctly licensed.
3. **The ionosphere is**
 - a. another name for the air we breath
 - b. conductive gasses at heights of 70 to 400km
 - c. a type of spherical transmitting antenna
 - d. a piece of amateur radio test equipment
4. **Amateur transmissions might be picked up by**
 - a. any wiring in the neighbour's house
 - b. only wiring which is longer than 2 metres
 - c. only wiring that does not have an earth lead
 - d. Earth leads only.
5. **One way of reducing the possibility of interference from a single sideband (s.s.b.) transmitter to a television receiver in the next house is to**
 - a. use an indoor transmitting antenna
 - b. increase power input to the transmitter
 - c. decrease power input to the transmitter
 - d. Decrease the number of frequency multiplying stages in the transmitter.
6. **Why is it advisable to purchase a ready made filter for fitting in the mains lead of a radio receiving device?**
 - a. A home made device may not let the radio signals through.
 - b. A purchased item will look much nicer.
 - c. The filter may not work well.
 - d. It is dangerous to put home made devices in the mains.
7. **The difference between a CQ call on 2 metres FM and one on HF SSB is that the call on FM**
 - a. is usually much shorter than when on HF SSB
 - b. must be made at the lowest possible power
 - c. needs to be repeated many times while somebody is tuning in to your signal -F
 - d. Is only permitted on the set calling channels. -,
8. **In the 2 metre band plan, the frequencies from 144.994MHz to 145.1395MHz are allocated to**
 - a. fm simplex channels
 - b. fm repeater inputs
 - c. SSB and CW only
 - d. Satellites.
9. **An adult should be present when erecting an antenna because**
 - a. it is a hazardous activity
 - b. heavy items will need to be lifted
 - c. they have more knowledge of First Aid
 - d. The antenna must be placed out of reach of a child.
10. **Turning the power off in an emergency is made easier and quicker if**
 - a. all the switches and plugs are colour coded
 - b. proper fuses are used in each plug
 - c. Each socket has indicator lights when they are on.
 - d. There is a single switch controlling all the power.

Club Events

4 June 2021	Club Night by Zoom
13-19 June 2021	Summer Solstice Activity Day (pick any day that week)
18 June 2021	Zoom Talk by Simon MM6OXH: Large Scale Software Defined Radar - A Practical View
19/20 June 2021	Museums on the Air—Cancelled
25 June 2021	Club Night by Zoom (early due to VHF Field Day)
3/4 July 2021	RSGB VHF Field Day
11-17 July 2021	Activity Day (pick any day that week)
24/25 July 2021	RSGB IOTA Contest (no entry from GM2T as we have been unable to secure a new site)
6 August 2021	Club Night
13 August 2021	Mini Rally (cancelled)
21/22 August 2021	Lighthouses on the Air—Cancelled

Club Attire

The club has a design for Club T-shirts, Polo-shirts, Sweat-Shirts, Fleeces and Jackets and all of these can be obtained from Patricia Bewsey Designs

When making an order please quote 'Cockenzie & Port Seton Amateur Radio Club' to ensure that the Club Logo will be placed on the required garments.

Cost will depend on garment and should cover the garment and logo, call sign addition will be extra.

If you wish to add your call sign to the logo then please ask at the time of the order.

Order from:

PATRICIA BEWSEY DESIGNS,

Tel/Fax: 01620 850788

Mobile: 07970 920431

Email: patricia.bewsey@gmail.com

Note: the shop at Fenton Barns is now closed

All Club in-person activities are under review due to the ongoing COVID restrictions, keep an eye on the website and facebook group for up to date information.

Answers from June 2021 newsletter "Test Your Knowledge":
1B, 2A, 3B, 4A, 5C, 6D, 7A, 8B, 9A, 10D