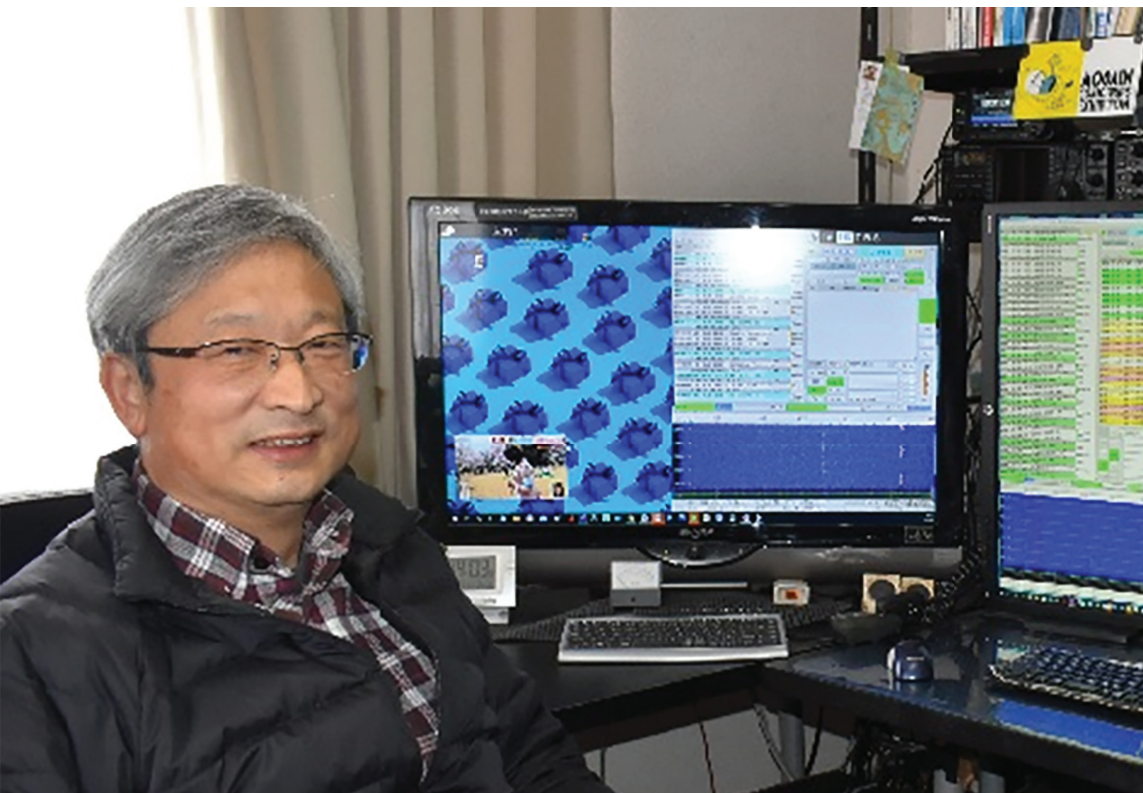


SIX NEWS NUMBER 157

DECEMBER 2024



JOURNAL OF THE UK SIX METRE GROUP

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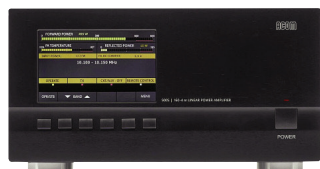


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On the front cover – *‘Tak’ Yutaka Tasaki, JR1LZK*

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Deadline for the next issue is 28th February 2025

CHAIRMAN'S CORNER

CHRIS MORTLOCK M1ABK



Well, it's been quite an eventful few weeks, hasn't it?

Just when I thought things might be calming down after the E's season, we were treated to some powerful auroral events in late August and early September! I had almost forgotten the thrill of a strong auroral opening—the rasping audio and the challenge of copying the other side's report is simply wonderful. Of course, auroral events aren't well suited to digital modes, which takes us back to the 'good old days' with lots of phone and CW activity. I'm always looking for Phone contacts and take part in the RSGB 50Mhz UKAC activity nights on the first Thursday of each month. They are fun to take part in and I wholeheartedly recommend them – just remember to put the UK Six Meter group as your club!

As I mentioned in my last column, “I could wake up tomorrow and the band will be wide open—or perhaps not!” More often its not sadly, but these past few week has been very different. I've woken excited to see what's happening with F2 openings to places like Australia, India, Sri Lanka, and even some great openings into North America. Kazakhstan and Asiatic Russia have been there most afternoons recently. The North American openings have been especially rewarding, adding new grid squares for both Phone and FT8 from my QTH.

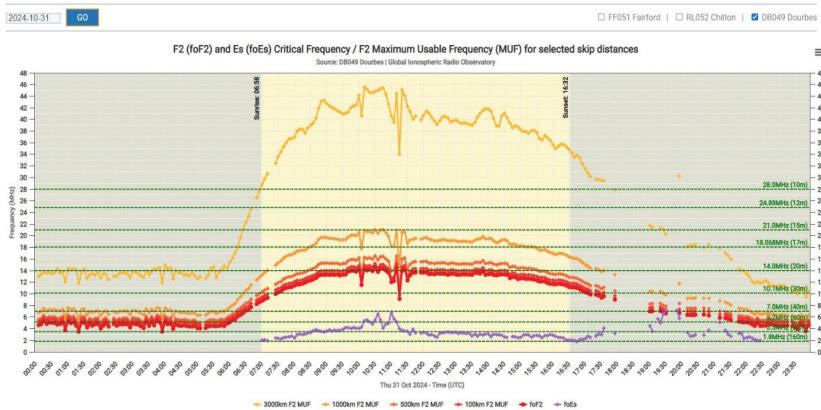
Looking back at my logs, I've heard numerous stations from VK, DS4, VU, 4S7, UN and countless U.S. and Canadian stations. Quite a shift

from what I initially thought was a lacklustre DX season, at least from my perspective.

I'm a regular user of the resources at Propquest <https://www.propquest.co.uk/> particularly during the E's season. Jim Bacon, G3YLA, does an excellent job providing forecasts and diagrams there. Lately, I've been focusing on the F2 charts, which, though not predictions, offer near real-time measurements from isosondes at



Fairford, Chilton (when available), and Dourbes. Recently, only Dourbes' data has been accessible, but even that provides valuable insights into F2 layer conditions. For example, on October 31, the MUF for F2 at 3000km reached 40MHz or above from 08:30 to 14:30, peaking over 45MHz around 11:00-12:00. When it's around 45MHz, F2 propagation on 50MHz might just be possible—definitely worth keeping an eye on! Below is what Propquest provides.



F2 Critical Frequencies on 31st October 24

Another invaluable tool is the 3000km MUF map on the KC2G website, which provides fantastic F2 maps using the same isosonde data

as Propquest. If you're familiar with this already, please bear with me! But for newer members or licensees, understanding the theory is one thing, while knowing where to look and how to apply it is another. I'm no expert myself and am always learning.

Now, onto some less exciting (but still important) matters.

We are still seeking a secretary for the group. I'm filling in for now, and while it's not a huge commitment, it would be wonderful if someone could step up. Please reach out if you're interested.

We're also looking for someone to assist as Editor. Mike, G3OIL, has been doing an outstanding job, but it's not sustainable (or fair) to expect him to continue indefinitely. If you'd like to lend a hand, please contact Mike, me, or any other committee member.

Finally, thank you for all the positive feedback on Six News! The recent bumper issue was especially well received, thanks to the hard work of Mike, the committee, and everyone who contributed articles and reports. Without those submissions, it would be a very slim publication. So, if you have any ideas or reports, please consider sending them in when the call goes out—they truly keep Six News engaging!

SECRETARY UPDATE

Hi everyone, I would like to extend a very warm welcome to those who have joined our group since my last secretary update;

G4COL	Colin	CO8LY	Eduardo	G7WKX	Simon
G3VZG	Richard	2E1JBC	John	KN4NPH	Wesley

I'm also very pleased to confirm that 198 members have also renewed their membership since my last report

Our membership number continue to remain stable with most members still choosing to receive paper copies of six news and 175 internet only members with the balance receiving sponsored or complimentary memberships.

There has been a slight increase in members choosing to pay vial PayPal subscription rather than pay as you go. As I am writing in other area's of Six News this will be a short report.

We're currently seeking a new Secretary for the UK Six Meter Group, and we'd love to hear from anyone interested! The role is straightforward and mainly involves standard secretarial tasks: organising committee meetings, taking minutes, managing membership records, and preparing mailings for *Six News* distribution.

Typically, this role requires about an hour per week for membership updates, plus another hour here and there when letters and labels need to be prepared. Committee meetings are held every couple of months and last about 60–90 minutes, so the time commitment is manageable.

As the committee explores improvements to streamline membership processes, you would also have the chance to shape how we manage membership in the future.

If you're interested in supporting the group as its Secretary, please contact me or any other committee member. I'd be happy to chat more about what the role entails!

73

Chris

M1ABK/M1K

EDITORIAL

MIKE WILLS, G3OIL



Well, the combination of a sunspot peak and the benefit of FT8 proved to yield spectacular results! As I write this, I have VO1CH, VK6OZ and ZS6NK all on the screen at the same time. Unbelievable! Fortunately, the timing of this edition was just right to get reports of the October action.

The contents of the News reflect the excitement of the moment but also takes a deep look into what makes it all happen. Chris G4IFX, has given us a second scholarly look at the Ionosphere. Carl, K9LA, has put into words and diagrams when what we all suspected about when and how to find the DX. As we were going to press, he added a really interesting bang up to date postscript.



The edition's interview is with Tak, JR1LZK. As well as providing a fascinating insight into and through his journey into Amateur Radio, he quite unexpectedly gave me a remarkable piece of radio history. It jogged my memory, for in 1957 Father Christmas brought me a military receiver, an R208. 40 kgs of absolute joy for a radio mad teenager. It covered 10Mhz to 60Mhz. Apart from listening to the amateur bands, I spent hours fruitlessly searching around 40Mhz looking for the signals from Sputnik. Tak's father was doing the same thing at the same time, but he was spectacularly more successful than I was!

As well as a comprehensive report from members about their recent activities, in "What's On Six" we have more contest news and an update on UKSMG DX support sponsorship.

I was aware that members receiving the printed edition of the News were not able to readily use the links in adverts and articles where they have been provided. Of course, all members can access the digital edition if they care to go on to the website. However, in order to make it easier for those reading the printed page, I have introduced Q codes as well as live links. Thus, in the adverts and where contributors have provided links in their articles, readers can now directly access Q codes with their phones.

Thanks to all those who have contributed to this edition, in particular Tak, JR1LZK. The next one will be published in April. Do please consider submitting an article. Don't worry about spelling or grammar, that's my job to iron out.

I hope that you enjoy this edition and I would like to take this opportunity to wish you all a very Happy Christmas and lots of DX in 2025!

WHAT'S ON SIX

In this issue, What's on Six dives into recent activity on the 50 MHz band, featuring contributions from UK Six Meter Group members around the world. From some excellent F2 openings to rare DX contacts, our community continues to push boundaries, logging impressive QSOs even in challenging conditions. As solar cycle 25 strengthens, we are witnessing propagation levels reminiscent of past cycles, with daily openings reaching Australia, Sri Lanka and North America.

As we move through solar cycle 25, we are experiencing some exciting conditions on “The Magic Band.” Contributors this time describe the resurgence of long-distance contacts, including unique experiences with Australian stations via FT8, QSOs with South African stations, and the thrill of working with locations as far-flung as Mayotte and Tristan da Cunha.

Bert (PA7MM) shared his summer experiences, having activated a station near the Swedish-Norwegian border and working DX stations from countries as varied as Brazil, Kazakhstan, and South Africa. Back in the Netherlands, Bert logged Tristan da Cunha using a six-element Yagi—a highlight of 2024.

In addition to Bert's experiences, Steve (M0BPQ) reached his 139th DXCC entity with QSOs in India, Vietnam, and various UN locations, using a 500-watt Flex 6700 setup. Martin (GM8IEM), who recently restored his 6-meter tower, achieved new DXCC contacts during extensive TEP propagation, including working Japan and European stations, thanks to his 6-element Yagi and an IC-746.

Among the most exciting reports comes the operation from Lance (ZD9GJ), whose portable setup on Tristan da Cunha made 1,434 contacts, including 173 via EME, marking a major achievement in the annals of 6-meter operation. Lance's dedication and skill led to groundbreaking contacts, underscoring the remarkable possibilities that the six-meter band holds.

As solar cycle 25 delivers higher SFI levels, operators like Dick (G0LFF) are observing six continents logged on the six-meter band, with contacts spanning as far as VP8 and the Pacific islands. While some of us have had technical or practical challenges, others maximised their resources, showing that 6-meter success can be achieved even with the most modest setups such as Dick's.

With the six-meter band showcasing impressive F2 and TEP conditions, I remain perhaps a little more optimistic about the cycle's peak years and perhaps a double peak ? – who knows!

So now onto the reports

Bert PA7MM (reporting from JO23SEse) says;

I am mostly monitoring what is going on 6m, and try to work the special ones. So I could work on 30th June FS/W8HC.

Mid July and August I was in Sweden close to border with Norway in JO59 square.

I managed to work most EU-countries, some easy ones like PA were hard to work because they have their antennas mostly not to the north. As dx wknd on 31/7 7X2RF and on 1/8 D4L.

On 3/8 TA4/PE2M and on 6/8 ZS6WN. Short openings mostly.

Back in The Netherlands my main interest was to work Lance ZD9GJ from Tristan da Cunha. First I had to study the WSJT-X Q65 pile-up protocol and see if I enabled or disabled the settings, Lance W7GJ describes this well on his qrz-page. And indeed, I could work him with my 6 element Yagi.

Lance is so experienced that he is able to work the small stations like mine. 2 weeks later I successfully worked him in FT8 directly. This was for sure the highlight for 2024 for me.

Other DX in September: worked V51PJ, XT2AW, A2NEW.

In October worked 5H1WX. KJ9I with EME, VU2LBW and XV9T.

On 24/10 a good opening to VK6 and JA but was monitoring only.

Received a few decodes from PX0FF from Fernando del Noronha island. They worked only one station from PA-land.

Sadly, we did not had the right propagation in JO23 square!

An interesting report Bert I really must brush up on Q65 after the initial interest I must admit I haven't used it very often. One of my long term goals is moon bounce but that will have to wait for a little while!!

We move onto **Jacquot LX1JX (reporting from JO30ab)** who says;

"I am on a trip to Japan for the next month, but recently there were some big openings from Europe to Asia and Australia to others. This morning (28.10) I worked VK6OX, XV9T, VU2DCC, VU2LBW and JH4JLV.

I had several other VK6 in here, but lost them in QSB. XV9T was at his peaks +26dB here in FT8!!! . I also heard 4S7AB, but could not reach him.

On 27.10. I managed to log my first VK4 for 34 years in my logbook : VK4KEE and VK4WDM and a few JAs.

On 26.10. I had a good SSB qso with Eddie XV9T. On 24.10. I had a pileup with 17 JAs and DS4EOI in my log. I also had an easy FT4 QSO with XV9T.

My 6m DXCC-standing is now 217 with New one worked 2024 : FT4GL, 5U5K, YE1BON, XV9T”

Thank you Jacquot, you were certainly busy and I hope you have a good trip to JA.

Jacquot also let me know that he is qrv on 40.680 MHz with a special experimental license, and has been since June last year, he uses the call LX5JX on that band

Now onto **Dick G0LFF (reporting from IO90wx)** – for those not familiar with Dick’s setup he only uses internal loft antennas, as you will see to great effect!

“The loft antennas still managing some DX, F2 now, with VP8LP & VK8NH worked in FT8 this last week. So that is six continents on 6M worked this year.

XV9T was loud in SSB but my rig had a moment and needed a full reset. Conditions are ramping up so I expect more in the coming weeks”

Wow! is all I can say, six continents this year with VP8 and VK you are rightly proud Dick well done! – I often see your signal on the band, your set up is working well and shows what can be done with a modest setup and some good working conditions.

We now move north of the border to Mike GM3PPE (reporting from IO85sp);

“A brief report on the past few days on 6m from here in southern Scotland. Quite amazing conditions. Last weekend many GMs worked into VU with good signals. (I was out at the time!). This is a scrappy note as the band is starting to open up again (0859). Hope you can use it. By the way, station here in IO85 is 400 watts to a 4 element yagi at 7m height.

The band has been open here for F2 DX from 0900 to 1130 for several days. On 28 Oct a big opening to VK6 saw VK6KXW and VK6DU worked plus another four VK6 stations decoded. The following day, the band opened with YB5QZ, followed by numerous UN stations, some very strong (+20) and from eastern Kazakhstan(MN square).

At 0950 DU6/PE1NSQ suddenly showed up with a strong, +10, signal and was quickly worked for another new one on the band. Several VK6 stations were also copied, and worked. A number of UA9 stations were worked as well as more and more UN stations.

4S7AB appeared about 11z and was logged for another new one. VK8DR was heard but not worked, before the band died after 1130z.”

Some excellent work Mike, there was also some strong Auroral activity early in the month where I worked a lot of stations as well, all in all adding up to a very interesting autumn!

We now hear from **Darrell G0HVQ (reporting from IO81ux)**, I often hear Darrell from my QTH working stations that I can hear but not work!

“As I write this at the end of Oct 24, we’re really starting to see some good F-layer propagation, something we never saw last solar cycle. The

band is looking like it was 22 years ago, with daily openings to VK, not only FT8 but VK and DU have been in on SSB too. I'm sure many old-timer 6m DXers like me are breathing a sigh of relief: prior to this cycle getting underway, we'd had a poor cycle and predictions for this and subsequent cycles were not good. I'm glad that it confounded the experts, still much for us to learn about the sun. In the recent months we have had some very happy 6m DXers including me. A few highlights: top of the list has to be working VK6TM on SSB, and then FH4VVK from Mayotte popping up from nowhere, and finally 4S7AB. Here's the full report.

Apr: 20/04 worked PY3FOX (GF49), PY2RN (GG66), PY5AM (GG44) & PY5HOT (GG46). 24/04 TT8XX (JK72) copied briefly. 28/04 ZS1LS/6 (KG56) & PY2XB (GG66) worked. 29/04 A2NEW (KG25) worked. 30/4 PZ5RA (GJ25) worked.

May: 01/05 (GG66) & PY4EK (GH80) worked. 7/5 D2UY copied. 10/05 6 incoming CMEs produced a visual aurora all over the UK, first time I've seen it - there's a picture of G0HVQ aerals with the aurora in the background on my QRZ.COM page. 11/05 huge VHF aurora in daytime, worked as far south as YO on 2m but Au died down before sunset. 12/05 PY2XB (GG66) & D2UY (JI64) copied, 7Q6M (KH67) worked. 13/05 ZS6AF, ZS6BUN & ZS1LS/6 copied, FH4VVK (LH27, Mayotte) worked - never expected that one. 25/05 HC2FG (FI07) copied. 26/05 3B8FA copied. 27/05 good SA opening copied LU6FOV (FF98), CE1LTL (FG41), CE2SQE (FG40). 28/05 Copied KG6DX (QK23) & worked JA7JPZ (PM98), JA7CSS (QM09) & JH7BKN (QN00). 29/05 More JA plus VK8AW copied.

June: the less said about the 2024 Es season the better: it was really poor. Hardly any propagation into the Caribbean, NA poor with no West Coast at all, Asia was only saved by one big JA opening late in the season, apart from the few JAs popping in during late May.

July: 14/07 Es-assisted TEP returns, PY2JA (GG65), PU2UAF (GG66), PY2EPL (GG58) worked. 15/06 VK8AW copied. 16/07 V51WW copied. 28/07 FR8UA (LG79) worked on SSB, FR8TZ (LG79) worked on FT8. 29/07 copied 3B8FA, 3B8CW, 3B8HK, FR8TZ, A2NEW, ZS6NK, worked CE2EP (FF46) & LU2GPB (GG03). Highest monthly SFI average of Cycle 25 so far (198).

Aug: 09/08 SFI=336, never thought we'd see the SFI so high above 300 this cycle. Another highest monthly average of Cycle 25 so far, a big jump: SFI average 245! Not much DX around as the Es season fades.

Sept: 13/09 XT2AW (IK92) & V51JH (JG77) copied. 14/09 VK6NH (OG65) copied around 1000z, 1st VK of the season; later XT2AW in again, and then later PY5EW (GG46). 17/9 CE3SX (FF46) copied. 20/09 VK6NH (OG65) worked. 21/09 V51JH (JG77), V51WW (KH81) & XT2AW (IK92) copied. 30/09 ZS6NK (KG46) copied.

Oct: 01/10 PY8WW (GI58) copied, ZS4TX (KG30) worked. 12/10 copied FR8TZ (LG79) & a single decode of ZD9GJ (IF32). 13/10 PP5RG (GG53) & PY5EJ (GG54) worked. 15/10 7Q8P (KH67) copied. 16/10 PY5EW (GG46), PY2HN (GG76) & PY7DJ (HI21) copied late at night 2130z. 17/10 Copied XV9T (OK33), FR5FC (LG78), 3B8FA (LG89). 19/10 Copied 9G5AF (IJ95). 20/10 XV9T (OK33), V51JH (JG77), ZD7BG (IH74), PZ5RA (GJ25), PY3SOL (GG30), LU2DX (GF05), LU1WFU (FE64), CX4AAJ (GF25) copied, PY1LO (GG87) & PY2XB (GG66) worked. 25/10 XV9T (OK33) copied. 26/10 Excellent F2 but unfortunately, I was out, station copied 3W9A (OK40), DV1ROY (PK04), VK6NH (OG65) and several UNs. 27/10 Copied VK2IR (QF55, 17,000km - called but band faded before we could complete), VK6ZLX (OG65), UN3M (LO61), 9K2GR (LL49), VO1SIX (GN37). 28/10 Huge 6m F2 opening to VK6, JA, 4S, VU. All on a skewed path 90 degrees. 4S7AB (NJ07) worked for a new 6m DXCC. VK6KXW (OF87) worked for a new ODX on 6m

14,717km, VK6TM (OG65) worked on SSB. At the peak was getting 30+ JA decodes each period. 29/10 worked UN1L (MO12), UN7LEW (MO13), UN7BI (MO43), UA9MA (MO43), copied 4S7AB (NJ07), YB5QZ (OJ00), DU6/PE1NSQ (PK10), VK6OZ (OF77)”

Thank you for the comprehensive update, Darrell and yes, I think you are right, it's great to have some conditions recently that bring back memories of previous cycles. I'm not sure quite how long or intense it will be but let's enjoy it whilst it's there!

We now move even further south with an update from **Rod ZL3NW** on 6m activity from ZD9GJ on Tristan da Cunha.

“Lance W7GJ over the years has activated many locations on 6m. Many of these have been remote with little or no past 6 metre activity. Over the years I have managed to have 6m EME contacts with Lance and thus obtained several new countries on 6m thanks to his activity.

This year Lance has activated Tristan da Cunha where I know of no past 6m activity. Lance was using a YU7EF designed 9 element yagi on a portable 6M8GJ boom, with a M2 24 ft portable mast and on this Lance could rotate and elevate his yagi antenna. Both the antenna and mast are made able to be disassembled for transporting to remote locations. Lance uses a 1500 watt amplifier and external preamplifier.

On earlier DX-peditions Lance has used the digital mode JT65A but recently and including ZD9GJ he has used the newer and slightly more sensitive digital mode Q65A for eme and FT8 digital mode for terrestrial contacts. On Tristan da Cunha Lance as ZD9GJ made 1434 6m contacts and of these 173 were via eme. This was an absolute amazing achievement by Lance. One terrestrial contact was even made into China. Needless to say Lance as the sole operator often had very little sleep or just short naps.

I was keen to have a 6m contact with ZD9 for a new country but unfortunately for a lot of the time there was no eme window to ZL i.e. where the moon could be seen from ZD9 and ZL at the same time. On the 5th October there was a short window between ZD9 and ZL3. This was prior to moon set in ZD9 and just after moon rise in ZL3. Unfortunately, the degradation figure at the time for the path was not ideal at -5.6. However, the opportunity for possible Ground Gain at both ends made trying for an eme contact well worthwhile. Lance and I were very pleased to complete an eme Q65 60A contact on this occasion. A few days later Bob ZL1RS completed an EME contact with Lance but it is not known of any other 6m ZL stations that were successful working Lance.”

Thank you Rod, this dovetails nicely with Berts report earlier on working Lance. Lance is truly an expert in this field and as you say has given many operators, many new countries whilst operating in some very challenging circumstances.

I am sure I speak for many when I say ‘Thank You’ Lance!

We now move to Australia and get an update from **John VK5PO (reporting from PF95gn)** – John wrote an article for us about his Bazooka dipole and is putting it to good use! – he lets us know that he has worked the following on his setup (IC-7000, 100W)

FT8 QSO's:

30th October 2024

Worked - F8DBF 11:02, F4EUG 11:07, SP3RNZ 11:14, SP5AA 11:17, DK2PH 11:19, SN5V 11:27, DL1EZ 11:28, DK2PH 11:29, DL3YEE 11:30, DK3EE 11:30, DK8NE 11:31, DL8YHR 11:33

Heard - ON4IQ, DL1KDA, LX2A, DL5AXX, SP4MPB, DJ9KG, SP7QJF, DJ6YX, DL3AT, SP8NR, DL3JPN, ON4CC, DL1KDA, DL5EE, SP5GMM, DL1YM, DL1ZU

Well the Bazooka certainly seems to be working well John, and again shows what a modest setup and the right perseverance together with some good conditions can do – Well done!

Moving a lot further north now we next hear from **Per SM4POB (reporting from JP70wl)** – often hear and work Per on SSB when the band is open, he always seems to be a good signal at my QTH even with only the slightest of improvement in propagation! – he reports;

“Hello Chris, on August 3rd I worked 3B8FA, FR4OO

August 24th SW8YA KN20 - September 18th ZS6NK

September 20th XT2AW, ZS6NL, ZS6NK

October 13th TR8CA

October 26th XV9T, 3W9A, XV9T also on cw, I also heard VK6TM, VK6NH

October 29th - UN3G, VK6NH, 9V1XX, YB5QZ

Oct 19, 24, 25, 27, 28

Watching EU and Uk stations work 9G, ZD9, VP8, VK, YB, XV9T, HC and others while one or two decodes up here above lat 60.

Back to the UK now and we hear from **Steve M0BPQ (reporting from IO91xp)** who lets us know;

.....●

“Its been an interesting few days on 6m. 19/10 brought Two HCs and VP8 as new ones. 28/10 was a big day with lots of JAs, 9K2, A6 and my first VK6. Yesterday (29/10), I saw two VK6s, but lots of Gs were calling, so I stood by to allow them to make Qs. I got my slot. I also worked UA9 for a new one - assuming it is legal. I also saw DU on FT4, but no QSO. No sign of YB, 4S or DU with me. I am up to 139 DXCC on 6m now.

V51s ZS6s both worked as well as seeing I saw A2NEW for long enough to work, but didn't make it through!

The equipment is Flex 6700, Expert amp (500W on FT8), and 6 El LFA yagi, about 40 ft long. I have a long feeder, and even though it is heliax, I feel quite deaf compared to others, so I have investigative work to do”

Thank you, Steve. I know you are located in quite an urban area and so no doubt the noise floor is a challenge but you are doing very well looking at your reports! I didn't make it to VK quite and I have quite a good noise floor here but my antenna is very low and blocked to the south east through to the east which may have something to do with it!

We now move back to Scotland to hear from **Martin GM8IEM (reporting from IO78hf)**;

By the end of July, I had fully recovered from surgery earlier in the year and started work on the repair and refurbishment of my 6m and 2m antenna systems; since then, progress has been hampered by poor weather. The rotator cage, stub mast and antennas were removed from the tower so that I could align the rotator and top bearing accurately. The system is now being rebuilt, and hopefully will be operational again before the end of October, before winter sets in.



The picture shows the tower in the background, with scaffolding in place to support it when luffed. The 6m, 2m, and 13cm antennas are “resting” on the scaffolding, with only the TV antenna still on the tower.

The picture below shows the rotator cage with new rotator and stub mast before re-installment. A new rotator control cable has been installed, and the 13cm system will be mounted elsewhere.

The tower was restored with 6m operational by the 24th of October. Over the next few days quite a lot of F2 and TEP propagation was visible on and off throughout the day on DX Maps, though no more than the odd period of decodes was being copied from the DX, so none was worked.



29-Oct-24: This all changed on the 29th, when the following 6m DX was worked on FT8. The band began to liven up around 0852 when **YB5QZ (OJ00)** was heard calling CQ with a signal of around -14 dB until 0915, though working few others. He was in and out for the next 45 minutes, finally responding to my call at 0858, completing for a new 6m DXCC. After working a UN station, I was called by **VK6TM (OG65)** at 1005 for a straightforward QSO during which he reached +2 dB, another new country for me. Shortly afterwards, **4S7AB (NJ07)** appeared and eventually responded to my calls at 1025 whilst peaking at -1 dB for another DXCC. At 1028 **VK6NH (OG65)** was also worked, and I failed to complete with **VK6DU (OF77)** a short time later. Other DX heard but not worked was **DU6/PE1NSQ**, around 0950.

Throughout this period, UN stations were in and out, and the following were worked: UN8PFE (**MO60**), UN7AB (LN53), UN7JID (**NN19**), UN7LEI (MO62), UN7GW (MN83), UN7LEW (MO13), UN7JX (NN19), UN8FR (**MO82**), UN7IO (**LO80**), UN2E (MO52), UN7PNF (MO60), and UN7PAK (MO60). New locators in bold.

European stations were barely heard until 1100. There was little new to be worked after 1130, although some VKs and many UNs continued to be heard until approximately 1215. An enjoyable morning of DXing, and my first experience of working DX via F2 on 6m.

30-Oct-24 Today, 6m propagation turned to the west, with some trans-Atlantic F2. I came into the shack part-way through an opening to HC, which lasted from 1256 to 1401, and worked HC2FG (FI07) at 1323 followed by HC2GRC (FI07), both peaking around -1dB. Missed HC1BI (FI09). W4SO (EL98) also heard but not called since we've worked before.

My setup is 500 watts into a 6el yagi from an Expert 1K-FA driven by an IC-746. The software used for FT8 is JTDX”

Thank you Martin, glad you are making a recovery from your operation, the rotator looks great and you have obviously been making full use of it recently – congratulations!

Next we hear from **Walt AJ6T (who reports from EM66)**.

“I did manage to work a New One on 6 meters recently, and they are few and far between these days. I got lucky on a brief opening (probably multi-hop Es) and snagged PX0FF on FT8 9Oct2024 1739 UTC. He gave me a -13 dB report. This was with 100 watts into a stacked pair of homebrew loops at 50 feet. The opening must have been exceptional to overcome S9 line noise. Right now (31Oct2024) I'm waiting for F2 to

bring me my first European QSO this season after hearing several loud SV9 stations earlier in the day”

Thanks Walt, I hope that the recent F2 opening from Europe to North America brought you that exceptional opening that you hoped for to overcome your line noise. Yesterday (2/11) was pretty good for me with lots of very strong North American stations, managed to work several new squares on SSB and a few on FT8 and FT4 as well. Back to the UK for the next report from **Mike G3XDV (reporting from IO92uc)**, the observant amongst you will recall a picture in the last issue of the Red Arrows about Mike's antenna! – he reports;

“This is my first activity report for the excellent Six News, although I have been on 6m for a little over 5 years now having moved to a bungalow with a small garden where, disappointingly, my previous 73kHz and 136kHz band activities could not be continued.

However, I am loving 6m which is different almost every day. My station is an IC-7300 delivering just under 100w to my 3-ele about 6m above ground. The location, Biggleswade on the Bedfordshire levels, is just 30m ASL but with a fairly flat take-off in most directions.

I frequently notice many stations working DX that I cannot even hear but perseverance has paid off to produce 113 DX countries worked so far. An interesting phenomenon I have observed is I often get through to a DX station just before the path collapses completely.

Presumably this means that briefly the optimal take-off angle favours the relatively near horizon seen by my antenna's low AGL and ASL.

Attached are highlights from my log for the last three months which I hope are in a usable format for you. It includes several new countries for me, for instance ZD9, XT, DU and (just this morning) VK.

This year seems to have been excellent for long-distance contacts - I have broken my distance record several times! Conditions have been especially good to the southern hemisphere but, unusually, I have not seen any really good openings to the USA and the Caribbean, and relatively few to Japan. Of course, sporadic-E and aurora have livened things up as well.

FT8 DX -

05/07/24 VO1SIX	26/07/24 JY4CH
06/07/24 KA1R, K1HC, W4MW, FP/KV1J	29/07/24 FR8TZ
10/07/24 KA1R	14/09/24 XT2AW
14/07/24 PY2EPL	03/10/24 DU6/PE1NSQ
15/07/24 JA7WSZ	15/10/24 ZD9GJ
18/07/24 JH0INP, JA1QIJ, JN1JFC	28/10/24 9K2WA
	28/10/24 VK6ZLX

Aurora

04/08/2024 GM4VVX, GM3WUX, OH1MM, MMZBH, M0HOM, M0TNX, GM0GAV, SM7FJE

12/08/2024 GM4VVX, EI6FR, G3TCT, GM3WUX, OZ7KJ, G3WNQ, PA5WT, ON6CC, DL1VDL PC0A, GM3WOJ

10/10/2024 F4VPC, GM3TAL, EI6FR

Meteor scatter

09/08/2024 EA7L, OZ5TG

10/08/2024 IK5AMB, IQ5MS, EB3ENW, EB2FJN

11/08/2024 EI4DQ, EI9E

12/08/2024 MM0AMW”

Thank you Mike for your report, I managed to catch the Auroras that you noted although didn't try meteor scatter for some reason this year.

Back to Australia now with a report from **Nigel VK6CPU/VK6NH (reporting from OF78wb)** who says;

“There wasn't much European DX around the equinox to be had from either the remote 6m station in OG65 or from my QTH in OF78, just the “TEP locals”; JA, BA, HL etc.

However, signals from XW4KV, V85T and XU7AJK were present for several days/evenings to both the NW and S of VK6. 9M7 was also seen quite often but not worked.

Late October consistent openings to EU appeared around 0800 UTC into northern VK6 but did not extend to the south of the state (where everyone lives).

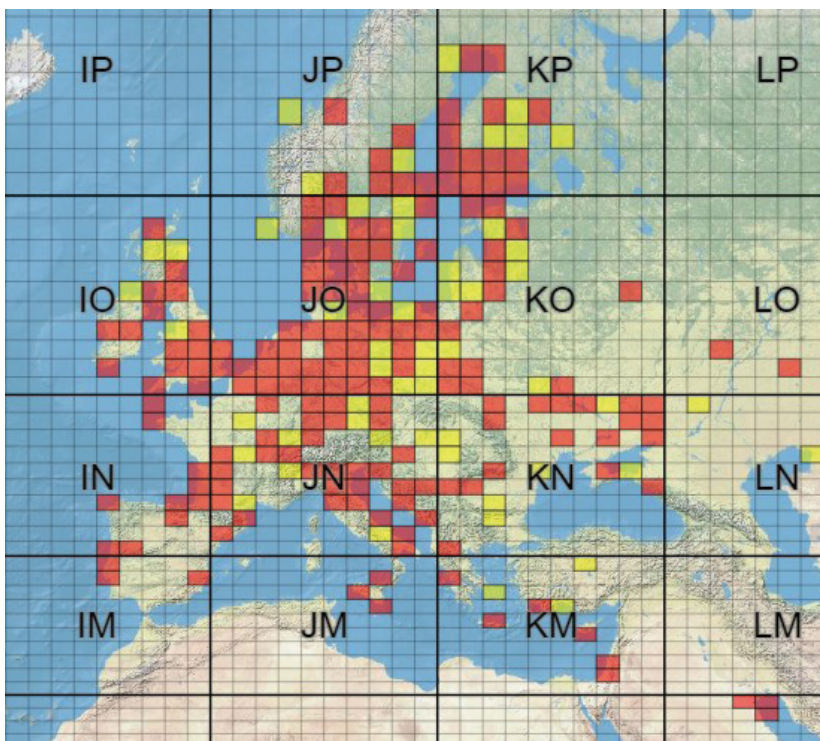
This changed on 28th October with the opening extending to the south into the Perth metro area. Countries worked on FT8 included G,GI,GM,F,PA,DL,SP & YL.

Signals/condition were much better in the north and Steve VK6TM(alias VK6IR) had 28 SSB QSOs with 7 countries: G, GI, GW, ON, F, ON, DL.

Since then, conditions have continued to improve.

On the 29th, Mark VK6BSA, located in the mining town of Newman OG96 worked several OH stations on SSB, despite only having an 80m doublet and very high local noise!!.

Below is a picture of the squares worked from VK6CPY in the last 12 Months



VK6CPU Squares worked from OG65 in last 12 Months

Thanks Nigel, as you say things have certainly picked up a little in the last month or so with so very good F2 openings occurring, most encouraging – let’s hope this is not all that happens and things continue to gain momentum.

Next, we hear from a long-standing member **Kerry G8VR (reporting from IO91wp / JO02fh)** who reports;

“I have not made a submission to Six News in a long time, it just seems to have escaped me. The majority of my operating now is from JO02FH and the EME shack that I share/own with Fred, G4BWP. I do occasionally operate from home, but am plagued by noise here now and fed up with tracking one source down only to find a new one pop up a week later.

Anyhow, looking back in the log it was a quiet summer, but I did manage FT4GL on 8 June 17:14z S-19 R+00, followed by 5U5K on 12 June 13:44z S-6 R+04, I'd missed 5U2K all those years ago, so was very pleased to get this one. We were on the moon on 27 August, when I worked Bob, E51EME (ZL1RS) at 12:59z who had good signals and had already been worked by Fred, G4BWP.

Fred went to make coffee and I said I would elevate the antennas down and have a look for CY9C terrestrially, amazingly, almost as soon as I started looking, there he was and we completed almost immediately. As Fred came back into the back into the shack with the coffee he couldn't believe I was working him. I'd sent him -18 and he gave me -12 (13:38z) a good day done! There was no more DX worked until 17 September, when the culmination of a 20+ year wait brought Lance (W7GJ) as ZD9GJ off the moon completing at 19:41z - what a great DX'peditioner he is.

I could have worked ZD9BV in a long opening on SSB one evening around the year 2000, when the band was open to him for at least 30 minutes. However, he insisted on lecturing what was a mildly unruly pile up, wasting so much time that when he'd faded out he'd only worked a handful of people despite great signals from him. He was rarely heard again after that and it was a frustration that had been hard to forget - until now. At the time of writing (3 November) Lance is still on the island and hopefully leaving today! Some days later, XT2AW was worked on 19 Sept 15:00z and later that day PY2XB at 20:40z.

After a few days break DU6/PE1NSQ arrived early at 08:18z on 3 October and 10m was also in good shape that day. 7 October brought PX0FF at 15:30z who was in and out on waves of about 1 min - you needed to be quick and have a bit of luck there. 12 October and FR8TZ was in the log at 10:09z S-21 R+02. After a break (but not in monitoring!) in the EME contest on 19 October I worked KJ9I off the moon at 08:47z with good signals (audible in the speaker) and later in the day VP8LP who I have never heard before 13:05z S-02 R+02 he was on FT8 initially, but then swapped to FT4 shortly after.

He's not been in my rx since. Since then the band has seemed to get better and better, but is a long way from the kind of propagation seen in 89/90/91 to my mind, where DX signals were consistently loud for long periods of time. 19 Oct LU1WFU 14:12z, 24 Oct XV9T 10:08z, 28 Oct VK6NH 09:21z, 29 Oct RK9UT (Z18) 10:09, then at 10:27z Kamal, 4S7AB who I have been looking for, for a long time - thanks Kamal.

Since then ZS6WN, ZS1LS/6, ZS6NK, EX8MEM, UK9AA, YB5QZ, TG9AJR, W0's, 8's, 4's, 7's and K6TW in CA. The icing on the 6m cake though was Joel, KG6DX who I had heard a number of times in cycle 22 but never worked, he got into the log this morning at 11:04z S-11 R-18 just after Fred, G4BWP - a new one for both of us. I look forward to the months to come and hope we might hear KHO/KC0W who knows"

Thank you Kerry, you note in your report about Lance W7GJ, as you say, and others report he truly is a wonderful DX' Expeditioner. As I mention elsewhere I heard Kamal 4S7AB but didn't manage to complete - hopefully I will get another chance very soon! Finally a reminder from **Peter G8BCG**, that as we see a little bit of DX that there is a comprehensive list of UK Firsts for Six meters.

This is located on Peters website at <http://www.g8bcg.org.uk/6mukfirsts.htm>

These listings are compiled from claims to be the first station to work a particular country on 6M from the United Kingdom. They are separated into the UK DXCC “entities” of G, GD, GI, GJ, GM, GU and GW. By their nature, they will never be 100% accurate.



The lists were originally created by Ken, G4IGO then maintained and updated by Kev G0CHE and in more recent times by Chris G3WOS. I hope to respect their efforts by keeping these lists as up to date and accurate as possible - *please help by submitting your claims and updates.*

There are quite a few gaps for countries worked since 2001 so it would be good to fill in the gaps. Of course, many of the more exotic DXCCs were worked first on EME but with the advent of the various WSJT modes, in particular FT8, many of these exotic entities are now workable by terrestrial means.

Please send any comments, omissions, corrections or new claims to Peter G8BCG at DXCC-Firsts@g8bcg.org.uk .

And that concludes this edition of What's On Six!

You will note that there are several reports that are very recent (last few weeks) as things started to get interesting, hopefully balanced with a few reports and updates covering late summer into Autumn.

As ever thank you for your contribution and continued support in putting What's On Six together, we couldn't do it without your input!

AN UNUSUAL OCCURRENCE

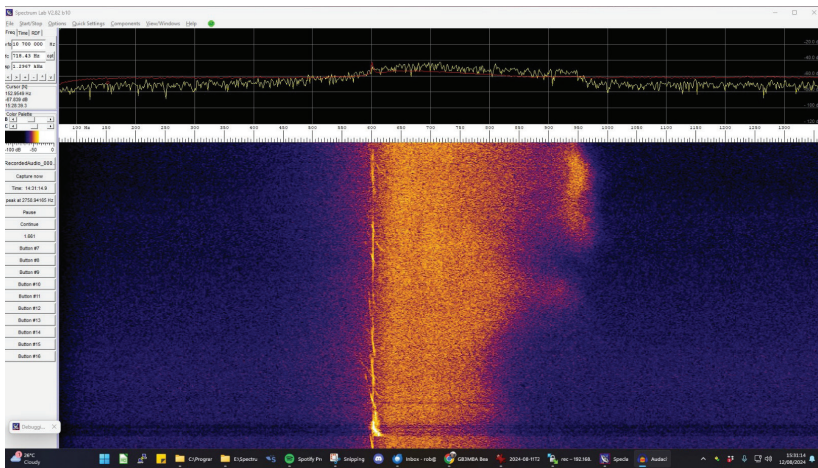
CLIVE DAVIES, G4FVP



An unusual occurrence happened on the afternoon of 12th of August 2024 when the peak of the Perseid meteor shower coincided with a strong aurora on 50 MHz (Global K-index of 8). Rob, M0DTS in IO94IL near Stockton-on-Tees in North East England was monitoring GB3MBA 50MHz Meteor Beacon which is located at the Sherwood Observatory of the Mansfield and Sutton Astronomical Society in IO93JC. The beacon illuminates the region where meteors burn up within a diameter of about 400km and is a collaborative project between the amateur radio and radio astronomy communities. GB3MBA output is 80W CW on 50.408MHz with A1A identification every 10 minutes. The screen shot below was taken by Rob, M0DTS on the DL4YHF Spectrum Lab program and shows the meteor traces on the TX line at 600Hz and the aurora doppler shifted and spectrum spread HF of up to 300Hz

WHEN IS 6-METRE F₂ PROPAGATION BEST?

CARL LUETZELSCHWAB,
K9LA



Around solar maximum of Cycle 24 (especially during the second peak in late 2013 to early 2014), we had 6-metre openings via the F₂ region. There weren't a lot of openings, as Cycle 24 was a small cycle. As a reminder, Cycle 24 was the smallest in our lifetimes and the fourth smallest in recorded history (which starts with Cycle 1 that began in 1755).

As we saw in my last column (issue #156 August 2024), Cycle 25 had just surpassed Cycle 24's second peak. With several more months of data now, Cycle 25 has definitely surpassed the maximum of Cycle 24 (we'll look at that in the next issue). That means we should be optimistic

that Cycle 25 will offer 6-metre propagation via the F_2 region. As a side note, the best bet for solar maximum for Cycle 25 is around the middle of 2025.

Question #1 – When are the best months for 6-metre propagation via the F_2 region?

Answer – In the northern hemisphere (where the three largest ham radio population areas are – EU, JA and NA), the autumn and winter months are best for F_2 propagation on 6-metres. This can be seen by running a VOACAP prediction for each month at a constant smoothed sunspot number. I did this for a path from K9LA in northeast Indiana to Europe (specifically England) at 1500 UTC. I ran the prediction at three levels of solar activity – a small cycle (blue curve – like Cycle 24), where we are now with Cycle 25 (orange curve) and a moderately big cycle (green curve – like Cycle 21). The results are in Figure 1.

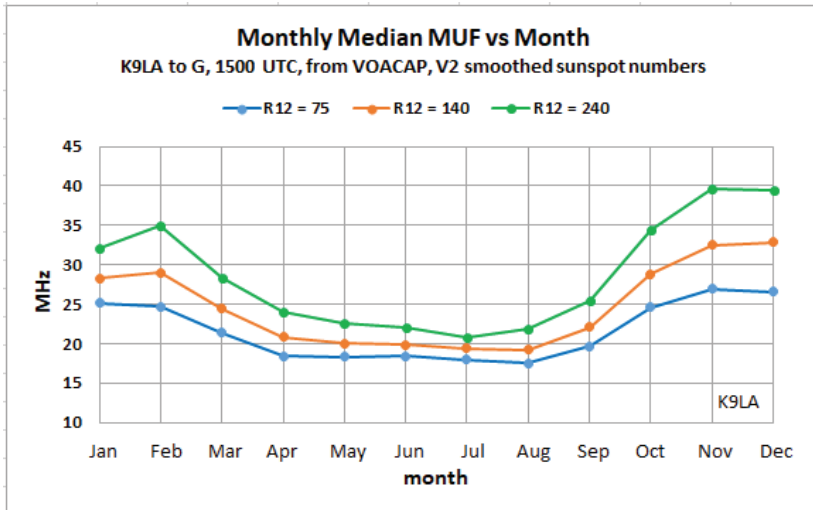


Figure 1 - K9LA to G versus month and solar cycle size

It is easy to see that in the northern hemisphere, the autumn and winter months provide the highest MUFs (maximum useable frequencies). The summer months provide the lowest MUFs. The reason for this trend is the change in the composition of the atmosphere throughout the year.

The important parameter is the ratio of atomic oxygen (O) to molecular nitrogen (N₂) at F₂ region altitudes. Atomic oxygen is important for electron production in the ionization process, whereas molecular nitrogen is detrimental to electron production. The autumn and winter months in the northern hemisphere have higher O/N₂ ratios than in the summer months, thus producing more free electrons and the higher MUFs.

Question #2 – When is the best time of day for 6-metre propagation from England via the F₂ region?

Answer – As you might expect, this will be path dependent. The highest MUF paths will generally be north-south paths due to these paths heading towards the robust equatorial ionosphere (this applies to both TEP and non-TEP paths). The lowest MUF paths will be east-west paths due to these paths getting to high northern latitudes. Figure 2 gives examples of paths from England to Cameroon (a north-south path), from England to W9 (an east-west path), from England to W6 (another east-west path) and from England to Japan (yet another east-west path) around the maximum of an average cycle, (like Cycle 23, where I hope Cycle 25 is headed), during the month of December.

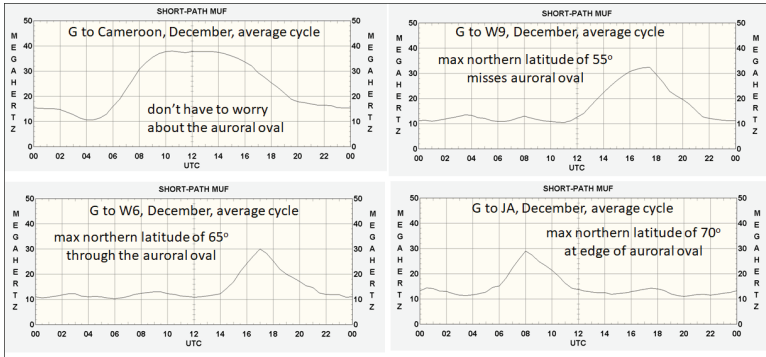


Figure 2 - Representative paths from G

There are a number of comments with respect to Figure 2. Note that none of the MUFs are at or near 50 MHz – more on this later.

First, north-south paths from England will have openings generally centered on local noon and be of a longer duration. East-west paths that go to the west from England will have afternoon openings. East-west paths that go to the east from England will have morning openings. If you're active on 6-metres, this should not be new information.

Second, for the east-west paths, the higher the latitude to which the path goes, the lower the MUF. That is a general statement, as the MUF for a path is also dependent on the hop distance (a longer hop can have a higher MUF) and the state of the ionosphere. If the path can be completed with low elevation angles, the MUF will be higher than a path with higher elevation angles.

Third, with respect to the auroral oval comments, the east-west paths that get near or go through the auroral oval could be degraded (lower MUFs) with elevated K indices. Another 'you should know this' statement.

Fourth, as noted earlier, none of the MUFs get up to 50 MHz for an average solar cycle (or even for a moderately big cycle per Figure 1).

Remember that these MUFs from VOACAP are monthly median MUFs around the maximum of an average cycle. That means on a couple days of the month, the MUF could be about 15% higher. That still may not get the MUF up to 50 MHz. We likely need an 'enhancement', which could be:

- 1) help from a spike in the K index (see my column in issue #152 Winter 2023)
- 2) a short-term area of high ionization in the right place at the right time (which is not captured in our monthly median model of the ionosphere)
- 3) a digital mode with its ability to hear weaker signals (likely from a scatter mode as opposed to a pure refraction mode) due to a narrower decode bandwidth

In conclusion, keep an eye out for 6-metre F₂ openings as we move into late autumn and winter. We've already had some F₂ openings, and we should have more.

Stop Press!!

Subsequent to Carl sending this piece for inclusion in the News, as he predicted, things really did start buzzing. To catch up with events, he has sent us a very timely addendum:

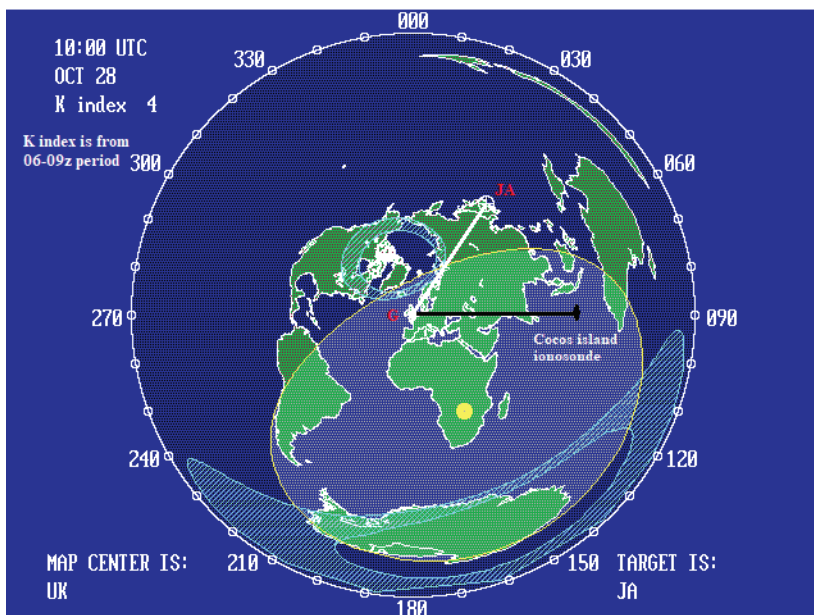
A PRE-HALLOWEEN 6-METRE SURPRISE CARL LUETZELSCHWAB K9LA

On Monday October 28, John G4BAO (a member of the RSGB's Propagation Studies Committee) posted an e-mail around 1000 UTC That *"We are at this moment experiencing a huge opening to JA on 50MHz.*

Difference is everyone is working them at 90 degrees azimuth (towards VK6)!"



Other PSC members chimed in with comments: G0KYA, G0IJZ, G4OGI, G4IFX, and G8BCG via the ON4KST chat. Several believed that the path was toward the Indian Ocean, and then a side scatter into JA. I agree with this comment, and posted the following image.



Azimuth equidistance map from the UK

England is at the center of this map, with the true great circle path to JA (the thick white line) on a heading out of England of about 30 degrees. This path grazes the auroral oval at a K index of 4. This depiction of the oval is the *visible* auroral oval, where visible aurora can occur. The radio aurora, where RF can be affected due to intense E region ionization, is typically equatorward of the visible auroral oval. This could explain why the true great circle path was not available.

On a heading of 90 degrees out of England (the thick black line), the path continues into the Indian Ocean, which is also in the vicinity of the southern crest (high electron densities) of the equatorial ionosphere. The Cocos Island ionosonde reported 3000 km MUFs of around 46 MHz at the time of the JA QSOs. This suggests that the RF from England could have either side scattered or refracted onto the great circle path into JA. G4OGI also showed a map with TEC values around 100 in the Indian Ocean area. That coarsely (not precisely) translates to foF2 values of around 18 MHz, which suggests a 3000 km MUF in the high 40s.

Some other comments from PSC members reminded everyone that this path is a usual path in the fall months around solar maximum. So get on the air and enjoy it when (if) it happens again.

THE WINTER MARATHON

DAVE TOOMBS, G8FXM

Now that winter is upon us, at this point in the current solar cycle we should expect to see some F2 propagation, so while you are working all the DX why not take part in the UKSMG Winter Marathon.

In 2014 the UKSMG was approached by Hannu, **OH3WW/OH1HS** who was the originator of the 50 MHz Marathon. Having built it up to a successful annual event over many years he asked us to take it over. The objective is to work as many grid squares as possible on the Six Metre band between 1st December 2024 at 00:00 UTC and 31st January 2025 ending at 23:59 UTC. The UKSMG Winter Marathon is open to ALL amateur radio operators world-wide. (UKSMG membership is NOT required). All you need to do is export your 6 Metre QSO for the Marathon period as an ADIF file and upload them to the UKSMG Website.

Further information can be found on the [UKSMG Winter Marathon page](#), and the full rules are available on the [UKSMG Winter Marathon Rules page](#).



SPONSORSHIP

TREVOR DAY, EA6NW/G3ZYY

A short update to keep you all abreast of news on the Sponsorship front.

We are making a donation to help the S9Z team activate Sao Tome. This has not been active for around six years and I'm sure it remains needed by many. It's a large group of multi-national operators and the expedition takes place from Nov 11 to Nov 20. I hope by the time you read this you managed to work them.



We recently were contacted by Don 7Q6M/K6ZO to help fund transportation of a rather large 8 element 6m antenna on a 40 foot boom. The antenna will be used in Malawi by a number of local amateurs, some very recently licensed. They are all keen 6m operators and even before this antenna arrived they have been heard with good signals into Europe.



Most recently we are helping to sponsor the TX7N DXpedition to the Marquesas Islands. This is a major expedition which includes a dedicated station for 6m running 500 Watts to a 4 element antenna on 6m. Part of French Polynesia this is by no means an easy location to reach on 6m from anywhere never mind Europe



however, if the propagation Gods are kind we can reasonably hope for some F2 propagation around this time.

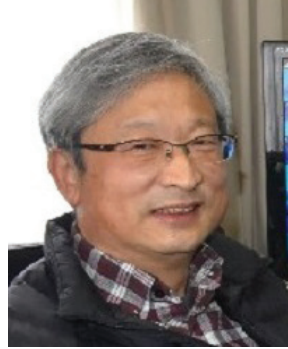
<https://www.dx-world.net/tx7n-marquesas-islands-dxpedition-2025>



A photo taken by Clive, G4FVP, IO94, on 10th October 2024

MEET THE OPERATOR – TAK TASAKI JR 1LZK

INTERVIEWED BY
MIKE WILLS, G3OIL



1. TELL US ABOUT WHERE YOU LIVE IN JAPAN.

I live in Mito-city Ibaraki which is about 100 km Northeast of Tokyo.

2. HOW DID YOU FIRST BECOME INTERESTED IN ELECTRONICS?

Actually, my father was a radio amateur, JA1AHP, he liked 6m very much. He built a sensitive, frequency stable receiver to improve his VHF homemade station.

An example of this is his reception and recording of the 40MHz SPUTNIK-1 in 1957, using his modified homemade 6m radio. (See following article).

When I was a little child my toys were fathers electric junk parts. I was also interested in how he was operating QSOs with homemade vacuum tube machines.

3. HOW AND WHEN DID THIS DEVELOP INTO AN AMATEUR RADIO HOBBY?



My father bought a TRIO TR-5100 (6m FM mobile transceiver 10w) to install his newly got 2nd-hand car. At that time I was 11 years old. I was asked to install the RIG and a 1/4WL whip antenna. I found it really interesting.

4. HOW DIFFICULT IS IT TO GET THE QUALIFICATIONS TO BECOME A RADIO AMATEUR?

Since I was too young, it was very difficult to get a qualification but there were some ways to get a ham radio licence. One was to take the national exam and the other was to learn in a weekend workshop and pass the final exam. I was still in primary school, so I went to the workshops and managed to memorise difficult formulas, and my father taught me what I didn't understand, and I managed to get a notice that I had passed the exam.

5. IS AMATEUR RADIO A VERY POPULAR HOBBY IN JAPAN?

When I started this hobby, Japanese makers, like TRIO, Yaesu, ICOM and many small makers, started to bring many new products to the market, making use of new semiconductor devices and so on. The spread of mobile phones has led to a dramatic decline in the amateur radio population. Nowadays, it seems that people who really

like radio communication and tinkering with machines enjoy irregular propagation, using NET communities and the like.

6. TELL US ABOUT THE EQUIPMENT YOU HAD WHEN YOU STARTED IN AMATEUR RADIO AND WHAT YOU USE TODAY.



My first equipment was a TRIO TR-1100 portable transceiver (6m AM/FM 1w) and homemade Cubical Quad antenna made of bamboo. Then I could make QSO with my father's mobile and local ham radio.

When I was in high school, I got 2nd class licence and I bought a 2nd -hand TRIO TX/JR-310 line which can operate HF and 6m SSB/CW.

When I was in university, I got a part-time job and got a 2nd hand FT-101 with FTV-650. I made a 6m linear-amp using 2 x 6JS6C. I also built a 5 element Yagi at a height of 10m and got a 100w station licence.

Actually, I was working at a Japanese plant in a UK company when I met G4IFX Chris. We started exchanging 6m information including UKSMG/SixNews and I went to Chris's shack in the UK on the business trip in Apr 1993.



In 2013, I retired from a chemical company and working in several places in Japan, including in Tokyo, I came back to my birth-place, Mito-city.

I upgraded my station and licence to 1kw in Nov 2017.



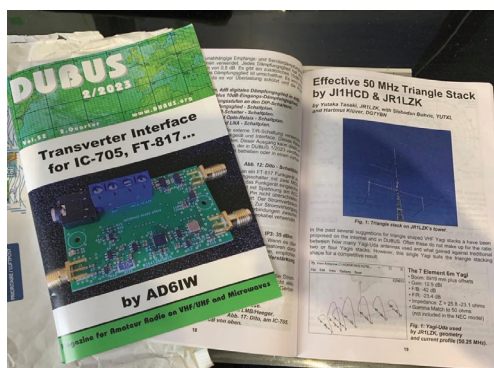
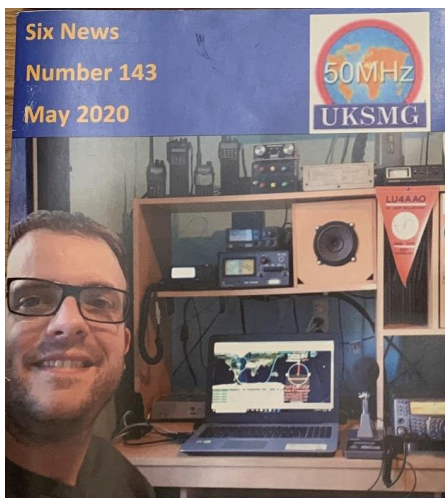
This is my current Shack

In 2024 Apr, I built a 3x7 element triangle stack on a 28m height clunk-up tower.



There were some published articles for my 3x7 element Triangle Stack as follows.

1. UKSMG Six News #143
2. [2.CO ham radio QEX #43\(2022 06/Summer\)](#)
3. [DUBUS\(2Q/2023\)](#)



7. HOW DID YOU BECOME INTERESTED IN 6M? WHAT IS THE FASCINATION WITH THIS BAND?

One day I was waiting for my father to call me on his 6m FM mobile on his way home, but I could hear other stations talking on the scheduled frequency. I found that they were JA6 stations, about 1200 km from my QTH. After finishing their QSO, I tried to call one of the JA6 stations and he replied to me! It was so exciting and that was my first Sporadic E experience on 6m.

8. WHICH IS YOUR FAVOURITE MODE?

I am active on 6m SSB/CW/RTTY and I like AM. Currently though, FT8 and other digital modes are my favourite on 6m. I installed 4 ports HDMI interface on my PC and default 2 port HDMI ports then I'm using 6 screens for digital mode and other radio functions.

9. DO YOU OPERATE ON ANY OTHER BANDS?

Yes, I can operate HF,VHF,UHF bands, however, more than 90% of total QSO is on 6m.

10. DO YOU HAVE ANY PARTICULAR AMBITION YOU WANT TO ACHIEVE IN AMATEUR RADIO?

Yes, I'm trying to get more countries! DXCC(current 172) and VUCC(curr.1118) on 6m. I got WAS (Worked All States) on 6m last year.

11. WHAT FUTURE DEVELOPMENTS DO YOU SEE HAPPENING TO THE HOBBY OVER THE NEXT TEN YEARS?

I am interested in making a video flight movie using my drone. It's possible to record your antennas and their location in a nice way.

12. IS THERE ANYTHING YOU WOULD LIKE TO ADD?

I like to make 6m DX QSO basically, so please call me if you find I'm calling CQ even if we have had a QSO before. Thank you very much and BEST 73! de JR1LZK 'Tak' Yutaka Tasaki

A REMARKABLE RECORD OF AMATEUR RADIO HISTORY!

In his interview, Tak refers to his father, JA1AHP receiving and recording Sputnik 1 in October 1957 on 40 mhz.

In Tak's words –“I found his recorded open reel tape after he was silent key and made a video from my father's recording to publish on YouTube”

This is an incredibly valuable piece of amateur radio history! (Ed)

<https://www.youtube.com/watch?v=ISNtU6eopTA>



INTRODUCTION TO THE IONOSPHERE, PART 2

CHRIS DEACON, G4IFX



INTRODUCTION

The objective of this article is to give a basic understanding of the propagation of radio waves through the partially ionised plasma that makes up the ionosphere. See my article in SN #155 for more background on the ionosphere and its structure.

The physics of ionospheric radio propagation is a subject that quickly gets very mathematical, but I've tried to explain the basic concepts in physical terms. I've replaced most of the equations and symbols with physical descriptions, which I hope will get the main ideas across.

NON-MAGNETISED PLASMA REPRESENTATION

A complete description of the way radio waves propagate through the ionosphere requires account to be taken of the influence of the Earth's magnetic field and (to a lesser extent) absorption effects. However, some essential aspects of radio propagation can readily be understood simply by treating the plasma as a lossless dielectric with no associated magnetic field. This representation is appropriate in many situations because absorption is mainly low (except in the D region) and because the process by which signals are returned to the ground is primarily one of gradual refraction rather than sudden reflection.

A key parameter is the **plasma frequency**, which, at a given point in the ionosphere, is the natural frequency, in the absence of absorption effects, of the simple harmonic motion which results if electrons and ions are moved apart. Assuming also that the thermal motion of the electrons can be ignored, the plasma frequency is proportional to the square root of the electron density. For example, if the electron density increases by a factor of four, the plasma frequency increases by a factor of two.

Another key concept is the **refractive index**, which you might be familiar with from school Physics. A difference in the refractive index across a boundary between different media (air and water, for instance) causes the path of an electromagnetic wave to bend. This is the reason that when you poke a stick into a pond it looks as though there's a kink in the middle. As far as the ionosphere is concerned, it can be shown that its refractive index decreases with increasing electron density.

Figure 1 illustrates how in the lower part of each of the E and F regions, electron density increases with height. From this it can be shown, by approximating the structure of the ionosphere as a stack of homogeneous layers, that an upward-directed ray will be bent progressively towards the horizontal as it travels upwards into regions of increasing electron density, until it reaches a turnover point where it becomes horizontally directed. From that point onwards it is progressively bent downwards again. In optics terms this is 'total internal reflection' within the dielectric.

For signals directed vertically upwards, the turnover point occurs at the height where the local plasma frequency is equal to the signal frequency. It follows that at vertical incidence the maximum signal frequency which will be reflected by a particular ionospheric layer will be equal to the plasma frequency corresponding to the maximum electron density. This is known as the **critical frequency** for that layer.

When a wave enters the ionosphere at an oblique angle, a more gradual electron density gradient is sufficient to bend it back down, and it follows that the maximum frequency at which a signal can be refracted back to the ground is significantly higher than the critical frequency at the centre point of the path. For a given signal frequency, rays below a certain angle will be refracted back towards the ground, but rays above that angle will pass through the ionosphere.

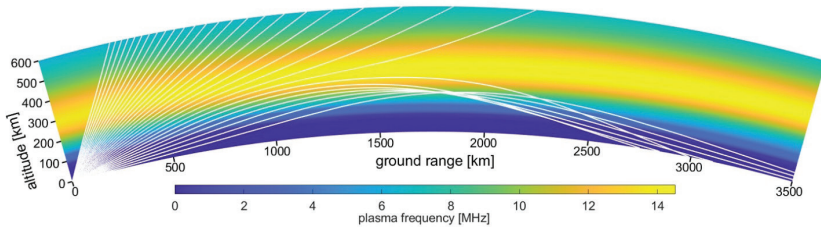


Figure 1: A simulation representing the path of a radio transmission at above the plasma frequency, launched at a range of angles to the horizontal. Higher-angle rays pass through the ionosphere, but lower-angle rays are refracted back to the ground. This is a simulated 40 MHz transmission due East from the south of England on 1st November 1989, near the peak of Solar Cycle 22. Generated using the PHaRLAP raytracing toolbox.

In the case of a non-magnetised lossless dielectric, the maximum usable frequency (MUF) on a given path is the critical frequency at the reflection point multiplied by a correction factor equal to about 1.1 divided by the cosine of the angle to the vertical at which the wave enters the refracting layer. This means that because of the geometry of the reflection, the lower the elevation angle, the higher the MUF.

Practical maximum values for the correction factor at maximum skip distance are about 4 at F-layer height (300 km) and about 6 at E-layer height (100 km). It is therefore possible to estimate that if a 50 MHz

transmission is directed at a grazing elevation angle to the horizon, the minimum critical frequency for oblique reflection of the signal at F-layer height is about 12.5 MHz, and at E-layer height about 8.3 MHz.

Observation shows that such high critical frequencies and electron densities are never reached by the background ionosphere in the E region and are only reached, transiently, in the F2 region close to the peak of the solar cycle.

MAGNETISED PLASMA REPRESENTATION

As stated earlier, ignoring the Earth's magnetic field gives only a limited understanding of what's happening. In many circumstances, a much more complete description is required if realistic results are to be obtained.

Edward Appleton and his co-workers conducted some of the crucial experiments that proved the existence of the ionosphere a hundred years ago. They were also the first to observe the phenomenon of double refraction, whereby a wave launched vertically is split into two elliptically polarised waves which travel at different speeds and therefore exhibit different time delays on reflection back to the ground. Subsequently Appleton was also the principal developer of the first comprehensive mathematical description of radio propagation in the ionosphere that took proper account of the influence of the Earth's magnetic field.

A complete description of the path of an electromagnetic wave through a plasma requires a full solution of Maxwell's equations, but except for simple cases, this can be a highly complex exercise which is difficult (or impossible) to complete exactly. A significant simplification can be made by adopting a geometric optics approach, which assumes a smooth, slowly varying medium with no scattering effects. Incidentally, this is

the way that the familiar diagrams (school Physics again) showing light rays passing through a lens or a prism are generated.

The most effective tools for plotting the path of a radio wave through the ionosphere are numerical ray-tracing models such as PHaRLAP, which was used to produce Figures 1 and 2. Ray-tracing models are built around the so-called Appleton-Hartree equation, which describes the refractive index along the path of the wave in terms of the frequency of the wave and the local properties of the ionospheric plasma. According to this equation, the refractive index of the medium varies with the frequency of the wave relative to the plasma frequency (as in the non-magnetised case), but it is also affected by other terms representing, firstly, the effect of the magnetic field, and secondly, the effect of absorption in the medium.

The Appleton-Hartree equation allows precisely two, and only two, solutions for the refractive index. Note that neither of them is equal to the result from the 'no magnetic field' approximation. The two values for refractive index correspond to two separate waves which have opposite polarisation and propagate independently through the ionosphere. These two 'characteristic modes' are each elliptically polarised because the electrons within the magnetised plasma are constrained to rotate about the Earth's magnetic field. A linearly polarised wave cannot propagate unchanged in the ionosphere.

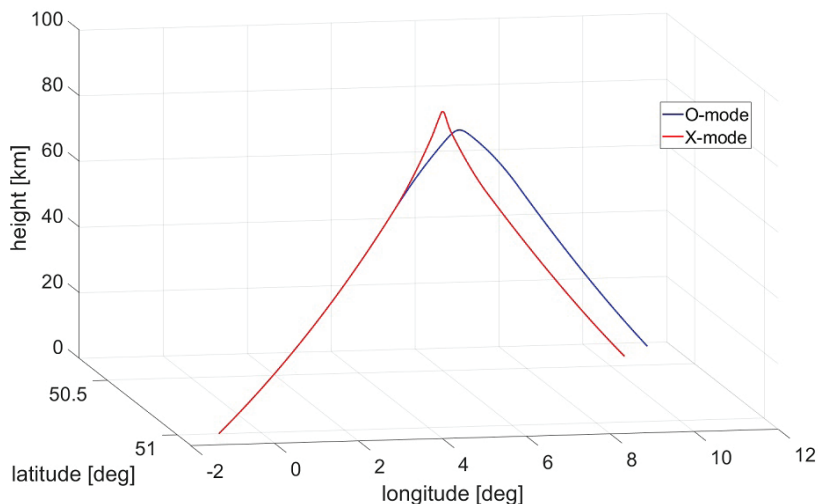


Figure 2: 3-D simulation representing the differing ionospheric paths taken by the two characteristic modes for a radio signal of a given frequency and launch angle. Ordinary ray: blue/right. Extraordinary ray: red/left. Simulated 1.0 MHz transmission due East from the south of England in August 2018. Generated using the PHaRLAP raytracing toolbox.

These effects are shown most clearly at low frequencies, as demonstrated in Figure 2. As a linearly polarised wave enters the ionosphere, it is decomposed into ‘ordinary’ (O) and ‘extraordinary’ (X) elliptically polarised components with opposite senses of rotation. The O and X waves travel at different speeds and can follow significantly different paths. The polarisation of the downward wave exiting the ionosphere will normally be some combination of the O and X components, resulting in a combined elliptically polarised wave of variable tilt angle and ellipticity. In certain circumstances, only one of the characteristic waves will return to the ground.

Finally, it should be noted that the Earth's magnetic field has an additional effect on the extraordinary wave. The critical frequency for the extraordinary wave is higher than that for the ordinary wave by half the **electron gyrofrequency**, which is the natural frequency at which the electrons rotate around the magnetic lines of force.

The electron gyrofrequency ranges from about 1 MHz near the geomagnetic equator to about 1.6 MHz near the geomagnetic poles, therefore the critical frequency for the extraordinary wave will be between 0.5 MHz and 0.8 MHz higher than for the ordinary wave. It should also be noted that at low elevation angles, and because of the secant law, the difference in the MUF between the ordinary and extraordinary waves will be increased by the same factor as the ordinary wave MUF itself. This means that, for F2 propagation at maximum skip distance, the MUF for the extraordinary wave will typically be about 2.6 MHz higher than the MUF for the ordinary wave.

CONCLUSION

I hope that has given a flavour of the key factors which affect the path that a radio wave takes on its journey through the ionosphere and (if we're lucky) to our antennas. What we observe depends dramatically on the properties of the ionosphere and its relationship with the Earth's magnetic field. These properties vary both geographically and over time, and that's why signals appear and disappear, and fade and change, as we watch the world turn.

Like the first article, this is based on an extract from my PhD thesis. If anyone wants to see the full text (including the maths), email me at the address in QRZ.com and I will be happy to send it.

CONTEST NEWS

DAVE TOOMBS G8FXM



The UKSMG works closely with the RSGB Contest Committee and in particular Mike Goodey, **G0GJV**. In the latest Beta release of the Minos Contest logger, Mike has added support for the UKSMG Summer Es Contest making it possible to create a new contest by downloading the UKSMG Contest Calendar in the same way as other supported RSGB and BARTG contests. Support for the UKSMG Summer Es Contest is available from Minos Versions ‘2.6.1000.0 Beta Second Installation’ and up.

To set up a new UKSMG Summer Es Contest, select “create a new contest”, by selecting ‘File/New Contest’ from the main menu. This will bring up the ‘Contest Details’ panel. Select the required contest year, then click on ‘Download Latest Calendar’. Next select the contest from UKSMG Calendar (see Fig 2 below).

The contest will now be configured, all that remains is to enter the ‘Contest name’, ‘Section’, ‘Callsign as sent’, your ‘Locator as sent’ and ‘Power’ as indicated in the red boxes in Fig 1 below. The main operator callsign will default to the Callsign you entered in the ‘Callsign as sent’ field. Don’t forget to enter your UKSMG Membership number in the ‘Exchange as sent’ field. Non-members will leave this blank or enter ‘0’

Details of Contest Entry - C:/Minos Beta/Logs/C010924A.minos

VHF Calendar uwave Calendar UKSMG Calendar

Selected Contest: _____ Entry: <None> [Edit]

Station: <None> [Edit] QTH: <None> [Edit]

How to use these settings? On Behalf Of (Club): (None)

Contest Name: _____ Band: 50 MHz Section: _____

Protected Age Protected

Callsign as sent: _____ Locator as sent: _____ Exchange as sent (Postcode, QTH, etc): _____ Power: _____

Start Date: 01/09/2024 End Date: 01/09/2024 Main Op: _____ Current Mode: _____

Start Time: 00:00 UTC End Time: 00:00 UTC Second Op: _____ USB: _____

Figure 1: Downloading the UKSMG Calendar

Select Contest from UKSMG Calendar

Contest Name	Band	Start (UTC)	Finish (UTC)	Sections
UKSMG Summer Contest	50	07/06/2025 13:00	08/06/2025 13:00	6F,6P,MO,QRP,SOF,SOP

Select Contest Download latest Calendar File Version 22.01 25/04/22 << 2025 >> Close

Figure 2: Selecting the UKSMG Summer Es Contest

Please note that this is a beta release, and the final release may differ slightly, e.g. the mandatory status of some of the fields in figure 1 above is likely to change in the final release which will probably be available by the time this goes to print. Hopefully this article will encourage you take part in next year's contest. Using this software will make contest logging much easier. My personal thanks and those of the UKSMG committee go to Mike Goodey, **G0GJV** for taking the time out of his busy schedule to support the UKSMG Summer Es Contest.

Minos is available for download from here: <https://minos.sourceforge.net>

And finally!

The bad antenna distance record?

I thought you might find this amusing!

He was about +10 (amazing) on the 30m dipole.

So I said to the CDXC lads - I wonder how bad of an antenna could still work this guy!

My 80/160 antenna is taken down and is sitting in a twisted random pile on the ground.

I tried it and worked him!

170500	0 -0.3	701 ~ CQ EA6SX JM19	*Balearic Is.
170516	Tx	2688 ~ EA6SX M0AGP IO91	
170530	-2 -0.2	701 ~ M0AGP EA6SX -14	Balearic Is.
170545	Tx	2688 ~ EA6SX M0AGP R-02	
170600	-2 -0.2	702 ~ M0AGP EA6SX RR73	Balearic Is.
170615	Tx	2688 ~ EA6SX M0AGP 73	
170630	-3 -0.3	701 ~ CQ EA6SX JM19	Balearic Is.

He was only about 10 dB weaker on the twisted random pile (TRP - will trademark that one 😊)

Have you heard of worse antennas being used?

Cheers and 73

Mike M0AGP

Advertisement

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UK SIX METRE GROUP



The UKSMG was formed in 1982 with the primary aim of encouraging an interest in the 50MHz band by all amateurs. For over 40 years it has supplied pieces of equipment to encourage and help enthusiasts to activate DX locations.

The ambition of the UKSMG, through the medium of its newsletter is to provide information on all aspects of the band, including such things as DX news and reports, propagation, beacons, equipment reviews, DXpedition news and technical articles.

Why not join the UKSMG? We have attracted over 700 members in over 50 countries around the world. The subscription rates are as follows: UK - £15, Europe - £16, rest of the world £16, (air mail). Digital subscription, ('Six News' by download, no printed copy): £10 for all countries. Payments can be by Credit Card, PayPal or bank transfer.

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Send to: **The UKSMG Secretary: Chris Mortlock, M1ABK,**

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