

YOTA 2017

a successful event



Over 80 young people from all around IARU Region 1, as well as Japan, gathered at Gilwell Park for a week of radio activities.

Young people from Europe and beyond travelled to the UK for YOTA 2017. They flew in to various airports, arrived at different train stations, even cycled from Germany; but they all ended up at Gilwell Park for a week of amateur radio pursuits.

The event opened with a welcome meeting hosted by Mike, 2E0MLJ (RSGB Youth Committee Chair) and Lisa, PA2LS (IARU Region 1 Youth Working Group Chair). The delegates were divided into five streams that would take on the various activities planned for the week including visits to London, operating GB17YOTA, and building a transceiver. The groups – named Hertz, Marconi, Morse, Tesla and Turing – each had an RSGB Youth Committee member to oversee the activities.

Throughout the week, Daily Diaries were uploaded to the RSGB YouTube channel (youtube.com/theRSGB). They give a real flavour of what it was like to be involved with such a successful youth event.

Operating GB17YOTA

One of the main highlights of the week was operating any one of five of the Special Event

Stations with the callsign GB17YOTA.

It was important that each participant had a fair chance at operating, so each stream had two sessions in the week and evening sessions were allocated through a sign-up sheet in the lodge hall at breakfast. For those especially keen operators, operating started at 6am and went on until early hours. Those operating rotated around the stations every half-hour, ensuring that they experience both the 'good' and 'bad' bands.

Many of us enjoyed hearing from the German team, who held a data mode seminar to display the use of data modes, including some more obscure ones such as Hellschreiber. Jakob, DK3CW, enjoyed telling people about one of his favourite parts of amateur radio – Hamnet, which he helps to develop. Hamnet is a fast, high bandwidth amateur radio mesh networking system that is widely deployed across Germany and Europe. It was interesting to hear about how this network is being used to do VoIP, FTP and web browsing only over amateur bands.

CW was also a highlighted mode in the week. Just over 20% of QSOs of the final 10,384 QSO count were made in CW. Many of us also enjoyed a showcase of High Speed Telegraphy sending by the Romanian team, including Mihaela, YO8TLK, Ene, YO8TOC and Teodora Neagu. Even though they were using double lever paddle keys, which aren't typical for HST, they still managed a stunning demonstration! A few of the delegates also

enjoyed operating using the 17m CW transceiver and 17m ground plane kits they constructed.

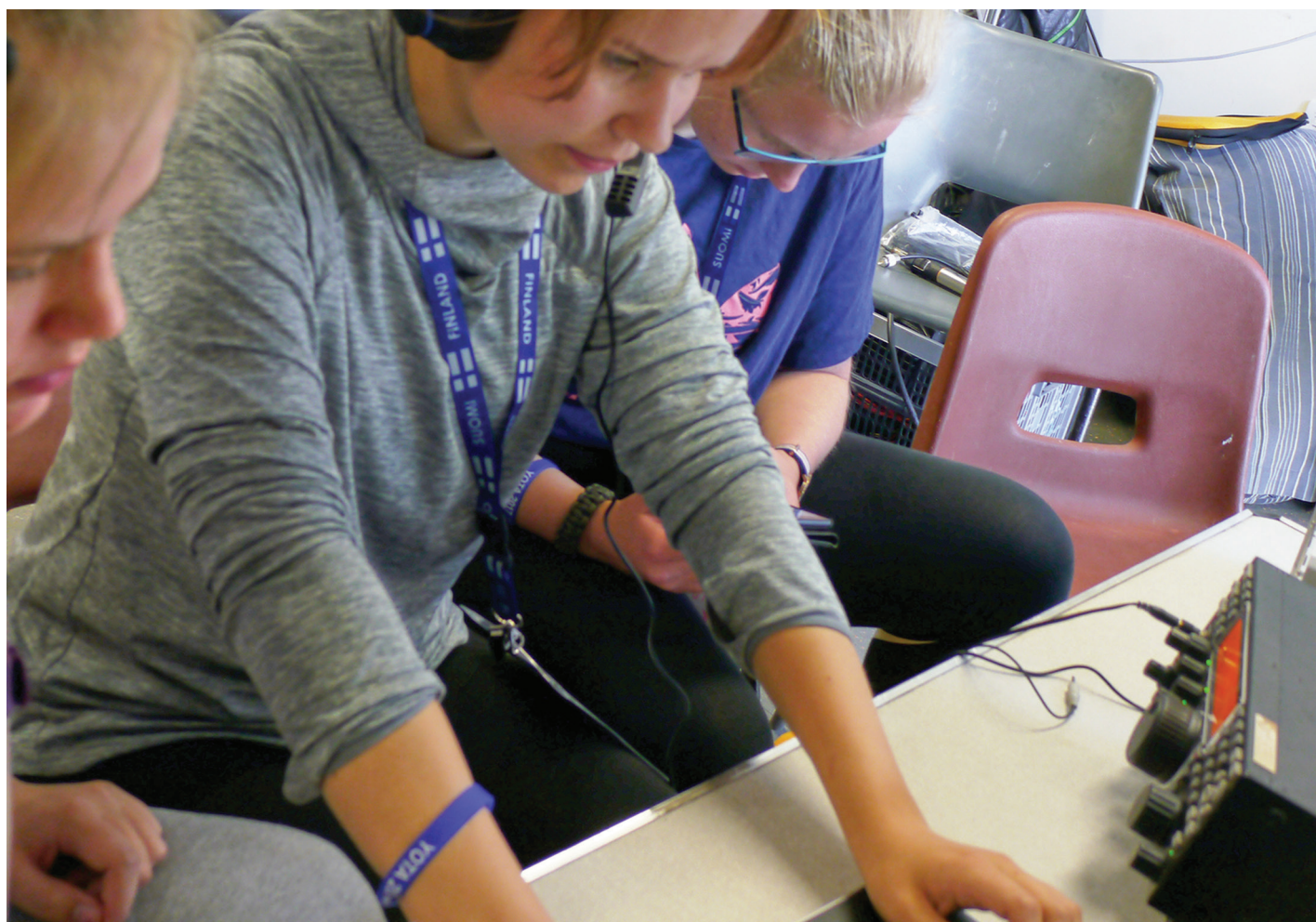
GB17YOTA was active on a wide variety of bands and modes throughout the week, such as meteor scatter MSK144 on 6m/4m and PSK, DominoEX and other digital modes on HF 30m. Thanks to all of those who worked us, and those who did so at least three times on three different bands can claim their award at www.rsgb.org/yota2017

On Friday afternoon, Mike, 2E0MLJ spoke to Bob Inderbitzen, NQ1R from the ARRL as GB17YOTA and W1AW respectively on 20m in a pre-arranged sked.

Summits on the air (SOTA)

We were fortunate to have Kevin, G0PEK and his daughter Lauren, M6HLR, fresh from completing their challenge of activating all 214 Wainwrights in the Lake District the week before. They were able to talk about their SOTA experiences, the lessons learned and the type of equipment involved, whether that's building of ultra-lightweight antenna systems or repurposing mountaineering equipment such as Nordic poles into masts.

Each of the visitors then went on to build a 17m ground plane antenna from a kit that could be used with the 17m transceiver the youngster had the opportunity to build during the week. All the youngsters had the opportunity to go to Wendover Woods (SOTA



Operating one of the five GB17YOTA stations, supervised by Camb-Hams, was a popular activity. This group from Finland were excellent operators.

reference G/CE-005) at some point during the week and some – depending on the order in which they undertook the activities – had the opportunity to use their YOTA-built antennas and transceiver. For those that didn't have the equipment built before going to Wendover, two FT-817 all mode portable transceivers were available allowing everyone the chance to activate the SOTA location.

Building a 17m transceiver

Hans Summers, GOUPL of QRP Labs. designed a 17m CW transceiver kit for attendees at YOTA 2017. The kit gave an output of 3 to 5W depending on the supply voltage and came with a software Morse decoder – making it ideal for those for whom the Foundation Morse Appreciation was their first encounter with CW. A microswitch on the printed circuit board could also be used as a surprisingly effective straight key, making CW operation even more accessible. There was even an integral signal generator and alignment tools for setup, and test equipment such as a voltmeter, RF power meter, and frequency counter. The kit's beacon mode also allowed for automatic

CW or Weak Signal Propagation Reporting (WSPR) operation.

Despite the kit building being some attendees' first brush with a soldering iron, they took to it well – with helpful guidance from RSGB volunteers. A few kits were finished in the allocated half-day slot, but most needed a second session in the shack. One keen builder was even seen adding the finishing touches at the dinner table! Everyone was able to take their newly-built transceivers home with them.

Visiting Bletchley Park

Each stream was able to pay a visit to Bletchley Park, the home of Britain's wartime codebreakers where they enjoyed a guided tour including the working rebuilt version of Turing's bombe, which was seen successfully giving the correct rotor and plugboard settings to decode an Enigma encoded message in a demonstration.

Many in the groups were interested to learn about the role of RTTY, still used to this day on the bands, in World War 2, in the form of a lesser known, but far more advanced, German cipher machine. The



Building a 17m transceiver from scratch.

Milo Noblet, M0ILO
with support from Jonathan,
M0JSX and Martin, M0YRM

Thanks to the YOTA 2017 Supporters

Whilst YOTA 2017 was organised and paid for largely by the International Amateur Radio Union (IARU) and Radio Society of Great Britain, we are immensely grateful to the many organisations, clubs and individuals who financially supported the event. We would therefore like to thank the following for their support of YOTA 2017 along with those who chose to remain anonymous.



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North Lancashire RAYNET
Spalding & District ARS



Some tricky Amateur Radio Direction Finding courses were set, with some youngsters covering large sections of the 108 acre Gilwell Park site.

Lorenz was connected to a teleprinter and used to encode and decode radio teletype – used instead of the Enigma for sending much longer messages. It was surprising to learn that the logical structure and workings of the machine were deduced only from a couple of received messages, three years before one of the Lorenz machines were obtained by Britain. Some visitors also had the opportunity to go around the National Museum of Computing, seeing a working, rebuilt Colossus – the first electronic, digital computer, which was developed to break the Lorenz cipher using statistical analysis.

Everyone was able to visit the RSGB's National Radio Centre and had the opportunity to operate the permanent special event station GB3RS. Some even managed to work GB17YOTA back at Gilwell Park.

Off to London

All the groups enjoyed their day out in London, as Gergana Ruseva, LZ1ZYL, team leader of the Bulgarian delegation told us “it's great to see in real life places I've only ever seen on TV!”. Each of the groups started at Parliament Square where they learned about the background of the

UK's Parliamentary democracy. They were then taken to Westminster Abbey, back around to Whitehall, passing the Cenotaph and monument to the women of World War II, before going past Horse Guards Parade. Then it was up to Trafalgar Square, through Admiralty Arch, along The Mall, seeing the Royal Society, St James's Palace and Clarence House before finishing at Buckingham Palace. Phew! It was a lot of walking but an extremely enjoyable tour.

Lunch was in Green Park before heading to the Science Museum. Here we were able to see Tim Peake's re-entry module from last year's Principia mission. For those visiting at the beginning of the week this was a build up to the ARISS contact planned during the week. Those who visited after the successful contact with the International Space Station were able to get a good feel for what it's like for the astronauts.

A few streams managed to squeeze in a trip to platform 9¾ at Kings Cross – an important location for fans of the Harry Potter series!

Amateur Radio Direction Finding

Throughout the week, the young people were challenged with finding a number of low

power transmitters in YOTA 2017's very own ARDF challenge. Two courses were devised, each with five transmitters. One course was on 80m and the other on 2m; these had the participants running across most of the 108 acre site.

All the transmitters were an AM carrier sending Morse. Each would transmit for 30 seconds giving an ident and would then fall silent allowing the next beacon to transmit. This meant that when searching for a specific beacon, participants needed to wait 2½ minutes between transmissions.

The receiver used on 80m was a handheld device that used an internal ferrite rod, giving two possible directions (front and back). A telescopic sense rod could then be enabled to allow a more positive direction. These were surprisingly effective and most participants found most if not all beacons on 80m. The fastest 80m time of 22 minutes was posted by three people, Eugen Vusak, Szabolcs Androsi and Lennart Kieft.

On 2m a simple 3-element Yagi constructed from metal tape measure and PVC piping was deployed. This had the receiver mounted to one end of the boom, resulting in a very lightweight receiving setup that could handle being knocked about as



London gave an opportunity for some to see places only seen on TV before.



Visiting the National Radio Centre at Bletchley Park.

participants moved through vegetation. The only rule laid down was that the receivers couldn't go for a swim in Gilwell Park's famous Bomb Hole pond! The best time on 2m (44 minutes, 6 minutes faster than 2nd place) was achieved by Peter Barnes, MOSWN from the UK team.

Amateur radio with the ISS

Talking to the International Space Station was one of the big highlights of the week. The ARISS UK team arrived on Monday, in advance of the planned contact with Italian astronaut Paolo Nespoli. They assembled an 18m tower holding one XQuad antenna with polarisation switching capability and a 10-element XY antenna (right-hand polarisation) on the same rotator – both with preamps. The main station comprised of a Kenwood TS-2000 into a power amplifier, giving approximately 250W output, connected to the antenna systems by 50m of Ecoflex15+ coax.

On Tuesday evening there was excitement in the air as a letter from the Society's Patron, the Duke of Edinburgh was read out.

We started calling on the VHF uplink early – "NA1SS, NA1SS this is GB4YOTA listening and standing by for a scheduled contact with the International Space Station". At the predicted acquisition-of-signal (AOS) time, there was no downlink. The ARISS team remained calm and switched to different uplink channels but to no avail, though we could see Paolo on HamTV via the Goonhilly Earth Station. Although disappointed, everyone understood that things don't always go as planned.

In the background, the ARISS team negotiated a second attempt with the ISS Mission Control Flight Director. This time using the 25W transceiver in the Russian module of the ISS. This second attempt was a huge success much to the relief and excitement of all those in the ARISS tent,

with twelve questions asked and answered ending with resounding cheers and applause from the audience.

Ofcom's listening station

We were lucky to be offered a visit to Ofcom's monitoring station at Baldock on the Thursday of YOTA 2017. Delegates were able to look at some of the new technology in use, including technology from Texas Instruments to record and later play back RF samples from a site, and backpack based equipment for surveying mobile phone coverage – as well as a similar unit designed for inclusion in Network Rail's New Measurement Train to monitor and thus help improve mobile coverage for those travelling on the National Rail network. For those of us in Team UK, it was also a great opportunity to discuss career opportunities!

Ofcom's field technicians gave us a demonstration of the equipment in their vehicles, including the roof-mounted direction-finding antennae, fed to a display on the sun visor, and we had a miniature DF contest using their handheld analysers to find various transmitters, including a US-standard DECT base station that conflicts with Three's mobile allocation, and the Ofcom DF pigeon (an 800MHz microphone transmitter – *almost* a 'wild goose chase'!).

Foundation exam time

Out of 72 young people who completed all their practical assessments during different activities, 54 delegates chose to sit their Foundation examinations and 63% had indicative passes – with two individuals scoring 'full marks'.

Thanks

The week just would not have been so successful if it hadn't been for the volunteers

and helpers who went a long way to making the event so enjoyable. To everyone, a big thank you, although we need to single out some individuals and groups who went above and beyond.

- Our mini bus drivers Geoff, GODDX, Neville, G8CDG and Gervald, G0GNF
- Kevin, G0PEK and Lauren, M6HLR for their inspirational SOTA talks
- 17m project assistance from Pete, M0OFN, Peter, M0DZB and Terry, G3VFC with debugging help from Rob, M0VFC and Gavin, M1BXF
- Maggie, London Tour Guide of the Year 2017 for her enjoyable London visits
- ARDF course setting and help from Frank, M0AEU, Alan, G3WNS and Barbara, G8AKU
- The ARISS UK team, led by Ciaran Morgan, M0XTD who worked miracles enabling us to complete the contact with the ISS
- Paul Chapman and all his team at Baldock who made the visit possible
- Alan and Barbara Wilson kindly invigilated both exam sessions, and thanks to Joy Burrells and Carol Meredith, M6MUP at the RSGB for the smooth administration
- Heather Parsons and Rob, M0VFC who stayed up very late to make sure the 'Daily Diary' videos were ready to go as quickly as possible
- GB17YOTA wouldn't have been so successful without the support of Camb-Hams, including Rob, M0VFC, Dan, M0WUT, Lawrence, M0LCM, Gavin, M1BXF and Dominic, M0BLF, as well as GB2GP's shack technician John, 2E0LX, whose technical knowledge was invaluable
- Stream leaders Milo, M0ILO, Rebecca, M6BUB, Kieran, 2E0NCN, Oliver, M6EUB and James, 2E0JPM
- Finally, the YOTA 2017 Project Team; Steve, G0FUW, Steve, M1ACB, Heather, Mark, M1MPA, Mike, 2E0MLJ and Sara, 2I0SSW. Thanks to all.