RSGB LoRa HAB challenge
– a new high for amateur radio

The RSGB balloon far above the earth.

HAB ground stations.

Amateur radio has always thrived on innovation, community, and the thrill of pushing boundaries. This summer, those qualities came together in spectacular fashion with the RSGB LoRa High-altitude balloon (HAB) challenge - a nationwide competition designed to spark fresh interest into the hobby and bring together clubs and individual operators from across the UK and beyond.

Months of careful planning went into the project, led by the RSGB Outreach Team. Securing the necessary procedures and licences was no small feat, and behind the scenes countless hours were spent ensuring every detail was in place. The event was generously funded by the RSGB Legacy Committee, with Moonraker sponsoring two superb prizes: £200 vouchers for amateur radio equipment both for the single operator winner and the RSGB affiliated club winner. Hi-Impact was entrusted with the balloon launch itself.

To make participation as smooth as possible, Dr. Dave Pegler, M0JKS produced a comprehensive set of instructions, guiding entrants through ordering and programming the required equipment. Fraser Wenseth, MM0EFI added further support with a step-by-step video, helping operators of all experience levels prepare their builds.

Once the RSGB Communications Team spread the word, interest surged. Demand for tracker boards spiked so dramatically that suppliers struggled to keep up, a clear sign that the event had struck a chord. I'd like to thank the above for their contributions.

And the momentum didn't stop there. If you haven't yet checked the RSGB website, now's the time, because we've uploaded a fresh set of instructions showing you how to re-programme your tracker board. This means you can now use it daily, whether you're tracking your journey in the car, logging a local walk, or even climbing a summit as part of the Summits on the Air (SOTA) scheme. It's a fantastic way to keep the spirit of the HAB event alive and continue exploring the power of LoRa technology in everyday adventures.

RSGB Board Director Ben Lloyd, GW4BML and Dave Pegler, M0JKS pictured at the HAB launch.
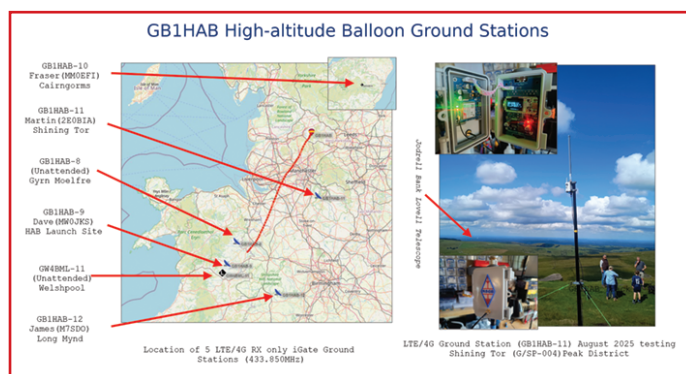
Launch day in Welshpool

The big day arrived in Welshpool, Mid-Wales. Despite grim weather conditions that made preparations challenging, Hi-Impact's team pressed on, attaching the LoRa digipeater, which weighed 700g, to the HAB at the last moment. At 11:10 BST, after a ten-second countdown, the balloon lifted into the grey skies, carrying with it the hopes of operators across the country.

High-altitude balloons like this have the potential to soar to around 90,000ft, but the day's strong winds and driving rain took its toll. Instead, the balloon reached a maximum altitude of 48,556ft before finally bursting. This is still an impressive climb into the stratosphere, and more than enough

The predicted flight path (yellow) and the actual flight path (blue).
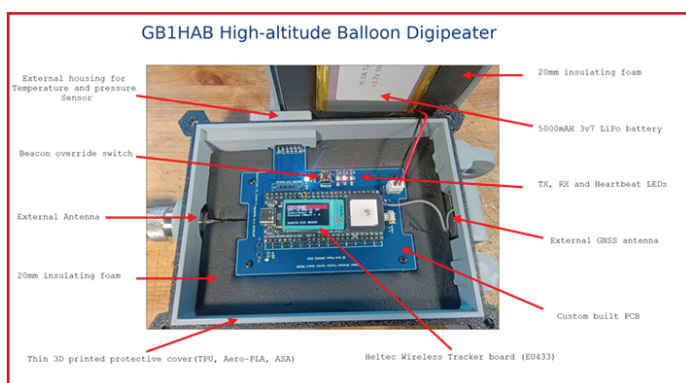
HAB Digipeater.

to test the network of stations waiting below.

To ensure success, a network of ground iGate stations was established along the HAB's projected path. Special thanks go to Martin, 2E0BIA, James, M7SDO, and Fraser, MM0EFI, who manned stations on Sining Tor (1,800ft), Long Mynd (1,695ft), and Logie Coldstone (800ft) in the Cairngorms, Scotland. Dave, M0JKS and I installed additional remote iGates at Llanfair Caereinion (1,500ft), Gyrn Moelfre (2,000ft), and at the launch site itself.

Even more encouraging was the wider community's response. We saw on the LoRa APRS map that operators across the UK had created and installed their own iGates, helping to extend coverage and strengthen the network. This spirit of collaboration was fantastic to witness, and we'd like to thank everyone who contributed. One such iGate, GM3STM-10, was installed in Scotland not far from Edinburgh and, impressively, it managed to receive a packet from the HAB digipeater. A brilliant achievement and a testament to the reach and resilience of the LoRa network.

The balloon tracked almost exactly as predicted, drifting from Welshpool up the country before finally descending in the Thursden Valley near Burnley. Along the way, it received signals from 43 different callsigns across the UK. The furthest digipeater packet was recorded at over 100 miles, hitting GW4BML-11 in Llanfair Caereinion while the balloon was on its way down at approximately 1,000ft.
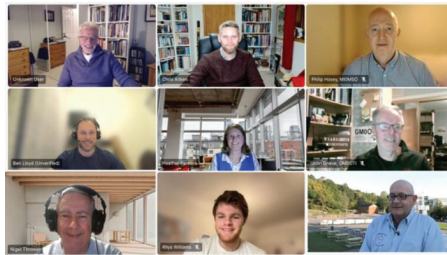
The RSGB Outreach Team.

A community success

What made the RSGB LoRa HAB challenge so special was not just the technical challenge, but the sense of community it fostered. Reports and images have poured in from across the country, showing operators young and old taking part, experimenting, and above all, enjoying themselves.

The RSGB Outreach Team extends its heartfelt thanks to everyone who contributed, from those who built and tested equipment, to those who braved the weather to man iGates, to every operator who sent a packet skyward. The event proved beyond doubt that amateur radio remains vibrant, innovative, and welcoming.

Looking ahead

While the HAB has landed, the excitement lingers. The event has not only showcased the possibilities of LoRa technology in amateur radio but also inspired new operators and re-energised clubs.

And, as the Outreach Team hinted, the challenge now is to dream up something even bigger and better for next year.

Competition results

The competition element added an extra layer of excitement. Operators were challenged to make contact with the HAB digipeater from the greatest distance. The winners were announced at the RSGB 2025 Convention by RSGB President Bob Beebe, GU4YOX.

Single RSGB member operator – Robert Williams, G7ATJ from the Isle of Wight

RSGB Affiliated Club – Newbury and District Amateur Radio Society (G5XV)

Congratulations to the winners of both categories. Robert, G7ATJ achieved an extraordinary 219-mile contact, whilst NADARS logged a 160-mile contact. The winner of each category has won a £200 Moonraker voucher.

These achievements were not just about distance. They reflected ingenuity, preparation, and in many cases, teamwork. Clubs and individuals organised buildathons, constructed antennas, and even climbed hills and mountains to maximise their chances of success.

Thank you very much all, 73
RSGB Board Director Ben Lloyd, GW4BML

Reports from participants

The RSGB LoRa balloon challenge was developed as part of the RSGB's National Coding Week activities for 2025. It built on the foundations of the LoRa activity developed in 2024 and was the perfect opportunity for both beginner and experienced coders to sharpen their skills and discover new ways to use them within amateur radio.

The challenge received a huge amount of support from radio amateurs, and we'd like to thank everyone who sent in reports. These are just a few that reflect the widespread engagement with this challenge…

Radio Society of Harrow

Thanks to all who organised the balloon event.

The Radio Society of Harrow participated in the event from outside our club house in Bushey in Hertfordshire. We operated under our club callsign GX3EFX using a Heltec Tracker purchased from the SOTA shop, which we flashed with the RSGB-modified firmware for the event. It was connected to a 6-element Yagi on a modified photographic tripod.

Whilst we were unsuccessful in contacting the balloon it was a fun morning for us. It was enjoyable preparing for and participating

in the event and the Club looks forward to the next one, whenever that may be!

Welland Valley Amateur Radio Society (WVARS)

WVARS, G4WVR was successful in its team approach. Paul, G1FJH was the operator for the group, which was a tactical decision as Paul lives on the top of a hill whilst the remaining members are located in the town of Market Harborough, which is in the Welland Valley.

Chris, M7IYS

I just want to say thanks for running the challenge. An advert for the competition is the reason I now have my Foundation licence and will probably take the intermediate exam soon. I set up a couple of trackers, one based on a TTGO


board using the same codebase as described in the guide. The other tracker is based around a PCB I have been working on for a work project and an off-the-shelf commercial SX1262 module. The plan was to have the TTGO as a backup but in the end both boards managed to send data to the balloon which I was extremely chuffed about.

Carl, G0TQM (GW0TQM/P)

I enjoyed preparing for the RSGB LoRa HAB challenge having dabbled with Visual Studio Code before and ventured up a mind bogglingly wet Great Orme (SOTA GW/NW-070) with two trackers programmed and a phone watching the YouTube livestream - testing it's waterproofing to the limit. G0TQM-5 was in the car (triple 5/8 whip) and G0TQM-13 on an Arrow 70cm handheld beam. The beam allowed me to venture to the trig point and gain an extra 11 or so miles just before the HAB popped.
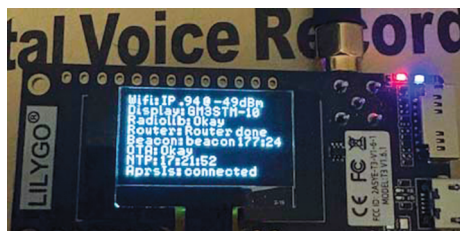
Scott, GM3STM

On the morning of the event, I connected the board to my Diamond x510 collinear on the roof of my Home QTH in Auchinleck, IO75ul, and settled down to watch the launch. I wasn't even sure the board would even work, so I was delighted when the first beacons came through! The ultimate cherry on top would have been to be repeated by the HAB but unfortunately that didn't happen this time.

The event was clearly popular, and I hope it will become an annual fixture, however, note to self: "buy the recommended board next time!"

Jane, 2E0WVJ

I enjoyed taking part in the RSGB LoRa High-altitude balloon challenge. It was fun programming the tracker and then on the day watching the launch, all while working at salute to the 40s at Chatham Historic Dockyard.

Sharon, MI7TBK

My son Sam, MI7WHD, (age 15) took part in the challenge from Altnarichard in Northern Ireland. Despite the weather, he had an enjoyable morning trying to

contact the balloon.

Thank you for an excellent event. Hoping to try the other coding activities soon.

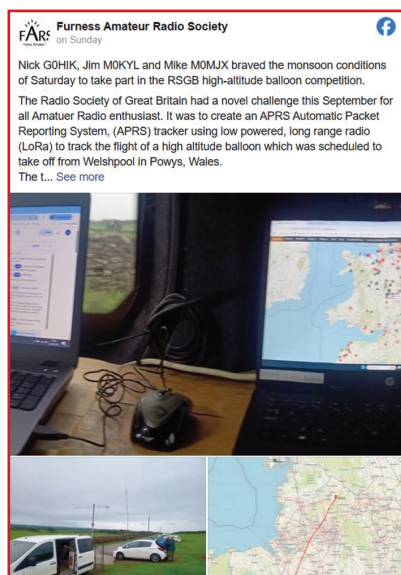### Robert, G0PEB/G7ATJ (Winner - Single RSGB member operator)

I'm pleased to report my participation in the RSGB LoRa balloon challenge, operating under the callsign G7ATJ. My station was deployed on SOTA summit G/SE-008 St Boniface Down, located on the Isle of Wight. This site was selected for its elevation and clear horizon, making it an ideal vantage point for tracking High-altitude balloon flights.

Despite wet and windy conditions with limited visibility, the setup performed better than expected. This challenge offered a rewarding blend of RF experimentation, coding, and outdoor adventure. I extend my thanks to the RSGB for organising such an engaging and educational event. I wholeheartedly encourage others to participate next year—it's a fantastic way to explore LoRa technology and refine your directional tracking skills.

Community engagement on social media

The challenge saw brilliant levels of support on our social media pages, from people letting us know they were taking part and how they were preparing, to some of the challenges they had encountered along the way.

Throughout the event we shared 20 social media posts on both our Facebook and X pages. On Facebook alone these posts had 243.3k views and over 1,433 link clicks, where people clicked through to find out more about the event, view the livestream and access the guides.

Furness Amateur Radio Society on Sunday

Nick G0HIK, Jim M0KYL and Mike M0MJX braved the monsoon conditions of Saturday to take part in the RSGB high-altitude balloon competition.

The Radio Society of Great Britain had a novel challenge this September for all Amateur Radio enthusiast. It was to create an APRS Automatic Packet Reporting System, (APRS) tracker using low powered, long range radio (LoRa) to track the flight of a high altitude balloon which was scheduled to take off from Welshpool in Powys, Wales.

The t... See more

Gavin Gill
Was very fun, thanks to all involved for organising!

Was my first time playing with aprs, I figured how to change the icons, although the icon chart I was using clearly was wrong lol.

I also figured longer ssid were harder to pick up!

Great few hours!

2E0VIO

Mark Haynes
Very cool

19 AMSAT-UK

Handle @AmsatUK
User Location Web

Date Collected Sep 20, 2025 11:46 AM BST
Followers 12,919
Retweets 1

How far is your signal soaring? The balloon is now flying at an altitude of 12,000ft and is currently over Oswestry in Wales. The @hiimpactconsult team is following its course and will collect the balloon in a couple of hours @hiimpactconsult #RSGBlora #RSGBoutreach https://t.co/lgMONAWwLb

John @M5JFS
@M5Jfs

I don't expect I was digipeated. I wasn't able to operate from a good location and the balloon headed north after launch making it even less likely I'd get in. Still, I am looking forward to experimenting further with LoRa.

6:15 PM · Sep 20, 2025 · 166 Views

tiny.GS @tiny_GS · 11h
Replying to @theRSGByouth
Awesome! The tinyGS 🎈 network will be listening for your LoRa HAB. We can't wait to see your results! 📍

"An advert for the competition is the reason I now have my Foundation licence"

The RSGB LoRa high-altitude balloon challenge
Find out what happened...

Re-live the launch

If you missed the livestream coverage of the RSGB LoRa HAB challenge, or you'd simply like to catch up on what happened, a video is available to watch on our YouTube channel. This video brings together the livestream launch, footage of the balloon soaring high in the sky, and then the final landing and retrieval.

rsgb.org/lora-balloon