

# Hosting a school contact with the ISS

**A** VHF line-of-sight QSO, easy, what could go wrong?

It's been a long-standing ambition of mine to help a school talk to an astronaut in space. So, before Covid, as a new member of Newbury & District ARS I sent a message to the committee saying, "why don't we make an application to host a school contact with the International Space Station?" I got the reply saying yes, come to the next committee meeting in January 2020 and discuss your proposal! I turned up at the designated place and time, explained what we needed to do, and was duly co-opted on to the committee.

The first question was what school did I have in mind? Not being local to Newbury area, I hadn't a clue. The NADARS Chairman at that time was Jeremy, G4DOQ and he suggested we contact the Mary Hare School in Newbury because the headmaster is the son of our former President Gus, G3LLK (now sadly SK). Peter Gale grew up with amateur radio and it meant we wouldn't need to explain to him what it was all about. Of course, being a little green to the whole thing, I just agreed and went along with it.

Jeremy, myself and the school arranged a meeting. I prepared a presentation on what the contact is all about and was rehearsing what I was going to say. The day before the meeting I got a phone call from Jeremy asking, "where are you?" "I'm at work" I replied "why?" Yes, I'd got the date wrong and I should have been at the school doing the presentation with him! That didn't bode well!

So, to cut a long story short the school jumped at the idea and I sent the ARISS (Amateur Radio on the International Space Station) paperwork for them to complete their part, which they soon returned to me. I filled in the radio side of it and I emailed it off to ARISS before the cut-off date at the end of March 2020. About a month later I got a reply from Francesco De Paolis, IKOWGF thanking me for the application,



John, 2E0JJC with his satellite tracking antenna.

but could I explain how I planned to enable deaf children to talk to and hear the answers from an astronaut on the ISS?

I gave it some thought and realised this was actually quite special. The school website explained how the children were encouraged to "Set Their Sights High" and how they were taught to lip read rather than use sign language. I penned a reply to Francesco explaining that deaf children were the same as any other child and should be afforded the same opportunities. To my surprise I soon had a reply saying, "Congratulations your application has been accepted".

By the end of 2020, we had an email confirming our schedule was to be just after Easter 2021 and that it was to be a world first with NASA, ESA and the rest of the world's space agencies being very interested in how we planned to pull it off.

ARISS volunteered to use their equipment instead of our own and now knowing what is involved and the incredible setup that ARISS have, this turned out to be a very wise decision!

After a meeting with the school's science teacher, Alex Ayling, we had all the plans in place. The school hall was already in use as the school's Covid testing centre, so it was decided to use the Arlington Arts Centre,

which is a modern theatre in the school grounds. Comprising a large stage and lots of seating, it was a perfect venue for a big event like this. We were expecting lots of people (students, teachers, parents) and, of course, the press and national TV.

One thing that we knew about in advance was that, regrettably, the video down link transmission from the ISS, that has been used for previous school contacts, was not operational. To be able to see the astronaut speaking would have been an obvious help to the children, so we had to rely on voice alone. The school was to use a 'palantypist' typing everything as it was said to put subtitles on the huge screen behind us and a sign language interpreter on the stage interpreting to everyone while also mouthing the words.

Sadly, another Covid lockdown happened and we were told our application had been cancelled. We were advised to make another application for January 2022. We did, but were later told that we'd been brought forward to the second half of the 2021 skeds and that we had a small choice of dates. We selected the week commencing 11 October.

Ciaran, M0XTD (ARISS Operations Lead for the UK), myself and Alex the school science teacher met up at The Arlington Arts

Centre to assess if it was suitable. There is a hill to the west with trees that could block the first minute or so of the signal so ARISS would bring their antenna tower.

### Setup and contact

Two days before the contact, Phill, G6EES and I went to meet ARISS at the school to set up the antenna. All went to plan despite the Land Rover towing the antenna trailer getting delayed.

The day before the contact, I joined Phill, G6EES and John, 2E0JJC at the Arlington Centre to set up the NADARS display stand. We wanted to demonstrate amateur radio in non-aural methods. John soon rigged up a 'tuned' antenna (about 5m of wire) for receiving FT8 on 20m (FT8 was chosen because we could be sure some international contacts would be on air for the demo) and also his handheld satellite tracking antenna that was much admired by Dr Chris Bridges from Suffolk University who was supporting of the ARISS team. I set up a SSTV system on 2m so that the audience could see how to receive images with a mobile phone and a very low-cost handheld.

Monday afternoon went to plan with teachers bringing groups of pupils down to see what was going on and to ask John plenty of questions, some were also wearing space suits loaned to the school by the UK Space agency. John proudly demonstrated his handheld satellite tracking system that uses the Heavens Above app on a phone to track a satellite while transmitting and receiving on a handheld.

Later in the afternoon the ten pupils that would be asking the questions to the astronaut arrived and we ran through a number of rehearsals. Everything went swimmingly.

Unfortunately, the school had not been able to secure a palantypist, the alternatives didn't work out when first tested but we kept trying.

On the day of the contact, with an emergency typist now organised, there was the issue of a lack of any suitable method to present the text in the correct way on the big screen (a palantypist has specialist software for this). However, we had a saviour: one of the ARISS team had been up until 3am the night before writing some software to allow subtitles to be displayed on the screen correctly, together with the other graphics and video etc. What he did was amazing given the time and pressure involved.

Ground Station GB4MHN (Mary Hare Newbury) was set up, running and tested in the auditorium by ARISS, with a backup station online and ready in the Netherlands just in case we had a problem. I must say that ARISS has a very impressive and professional setup.

January 2022



Student Milly McCarthy interviewed by BBC TV.



The ARISS Ground Station sound and video production team.

Late morning the press arrived, it was interesting to see both BBC TV and ITV News crew with their cameras and reporters along with the newspaper reporters. Many interviews were made and lots of questions were asked to all the people involved. Jeremy, G4DOQ represented NADARS for the interviews and all went well.

The auditorium was full of students, teachers, parents and other dignitaries and there was certainly a buzz of excitement from everyone in the audience.

The event started on time (thanks to Phill) and the Mary Hare School Deputy Head came up to the stage and said a few words. This was followed by me with my scripted 10-minute talk about amateur radio with a fantastic video backdrop made by

Phill. I handed over to Alex who explained how the questions and pupils were chosen. Ciaran from ARISS then explained what was going to happen and told the audience what needed to be done and how we were going to run with the sked.

Next on the stage was Susan Buckle from the UK Space Agency who, along with Dr Chris Bridges from Suffolk University, did a fantastic and professional Q&A session that took us up to five minutes before the scheduled QSO time.

**Lloyd Farrington, M5LDF**  
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Lloyd, M5LDF with student Rosie Harris waiting for the ISS signal to come in range.

It was shortly after they started, I noticed Alex Ayling (the science teacher and our main contact from the school) pointing his laptop towards the stage because the live web feed was down! My heart began to sink! After the event ARISS explained that there was a subtle software glitch, which showed itself five minutes before the go-live, that had brought the tried-and-tested ARISS Streaming Server to a halt. ARISS successfully put into action a backup plan and managed to get the live stream online via YouTube.

The FULL recording (including the talks that you may have missed on the day) is now online at <https://nadars.org.uk/ISSVideos/ARISS.mp4>.

I then took up my position with the big red PTT button, called the first pupil on to the stage and she took her place in front of the microphone.

The static noise came up loudly over the theatre's PA system and I knew this was it. ARISS nodded to me to start calling. I did and ... nothing, just static. Another call ... still nothing, more static. Third time lucky... more static! Just before I pressed the PTT on my fifth call, I heard a slight change in the noise and I called again. "*November Alpha One Sierra Sierra this is Golf Bravo Four Mike Hotel November are you receiving? Over.*" Static, there was a crackle, more static and then .....

"*Golf Bravo Four Mike Hotel November this is November Alpha one Sierra Sierra, over!*"

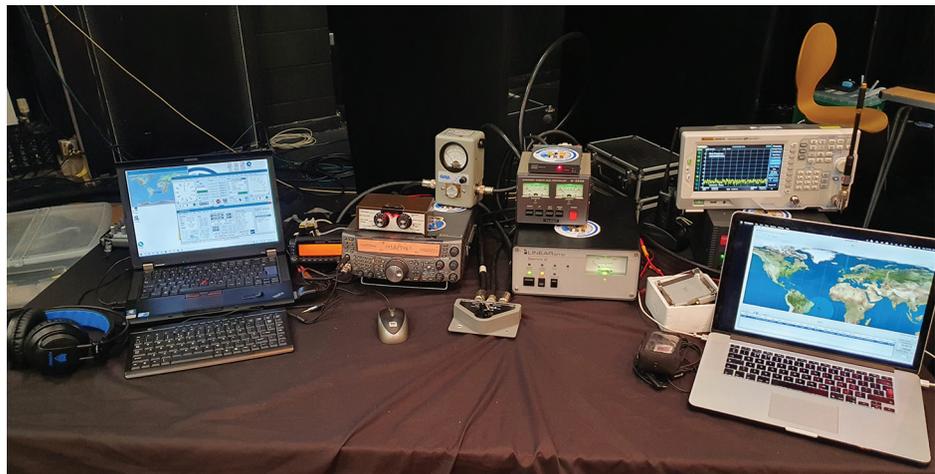
There was a silent cheer and arm waving, including from the relieved ARISS team.

13-year-old Rosie quickly took over and very professionally asked the first question. American Astronaut Mark Vande Hei's reply wasn't too clear for us at first due to attenuation caused by trees on our horizon, but that soon changed and the signal came booming in! The children stepped up one after another to ask their questions and all too soon it was my turn to end the contact with the ISS.

A world first had just taken place. The auditorium gave a huge round of applause and as I looked around, I could see several



The ten students who spoke to the astronaut (and a teacher).



Part of the impressive ARISS Ground Station.

teachers in the audience wiping tears from their eyes.

### Thanks

It really was an emotional rollercoaster, and I can't thank everyone enough for all they did, but I would like to mention the children and staff of Mary Hare School, the two people from the UK Space Agency and the six people of the ARISS team for all that they did on the day, but a special thanks go to John, 2EOJJC for manning the NADARS stand (mostly singlehanded) and enlightening the school kids about amateur radio, but most of all a *huge* thank you to Phill, G6EES who kept me on track, in focus, at the right place at the right time. He also made sure the school knew what they were doing too.

These are all the questions asked:

1 Rosie (13 years): Do you have to learn a

sign language to communicate if something goes wrong with the radios in your suit?

2 Jacob (18 years): How do you tell directions in space?

3 Harrison (11 years): What do the Northern Lights look like from space?

4 Hollie (16 years): How can you shower in zero gravity?

5 Jasper (13 years): What's your most favourite space technology?

6 Milly (18 years): If there was a fire, how would you evacuate?

7 Dominika (14 years): Do mobile devices work in space? For example, a Smart Phone?

8 Oliver (13 years): If you could take one thing from home into space, to make life more fun what would you take and why?

9 Zak (17 years): What is it like to wake up and see the earth from space?

10 Julia (15 years): How long have you been in space for?