

SSTV with the International Space Station

Galen Wilson KF5BET

Cruising around the internet on Friday night, I came across someone who was posting about the SSTV images they had decoded from the ISS that evening. "What is this?" my curious mind asked myself. So, digging a little deeper, I found out that ARISS (Amateur Radio on the International Space Station) was celebrating twenty years in service this weekend by sending a series of twelve images via slow scan television over 2m for a period of three days.

Upon further investigation, the process for decoding the images seemed very simple with minimal equipment. I had to give it a shot! I watched a couple of YouTube videos on how people were accomplishing this activity and went to work on getting everything needed. The one video that inspired me was of a young man who was using an Arrow portable dual band antenna, a 2 meter mobile rig, a laptop computer and his smartphone.

First up was the software. I already had multiple apps on my phone for satellite tracking and decided to use ISS Detector which is for visual sightings. This app told me when the ISS was going to be passing overhead along with start and end times and provided minimum and maximum elevations. There is also a graphical radar screen which shows the path imposed onto a compass. The next app was Robot36 which is a decoding app for SSTV. This app takes the coded transmission and decodes it into the image. It was very easy to use and worked flawlessly. We elected to use the app since no interface would be needed. How is that you ask? Simple. All you do is run the app and then place the microphone of the smartphone next to the speaker on the radio and presto...it starts to decode the image. We elected to use the old trusty Yaesu VX150 2m handheld. The antenna was, of course, the tape measure yagi. Our equipment was complete.

Our first pass attempt was Saturday evening at 9:45pm with a projected time of 6 minutes. We elected to use a parking lot so that we could get better sightlines to the horizon. Off to Stines Hardware store. We arrived and the parking was deserted – perfect. I used ISS Detector to get our bearings of the path while Kendra, KF5FYS, used her phone to start the Robot36 App. We set the frequency on the radio to 145.800Mhz and pointed the antenna towards the southwestern sky. Kendra placed her phone with the microphone resting near the speaker on the front of the radio. Neither of us knew what to expect. All of a sudden, there was a burst of tones from the speaker. The code was being sent. It was very melodic and also very clear (gotta love FM!). I had my phone laying on the yagi handle and concentrated on keeping the antenna focused on the path of the ISS while Kendra held the radio and her phone. Kendra spotted the ISS so we were able to visually track the station through most of the pass, only having to resort back to the phone for the last couple of seconds. The image took approximately two minutes to download and was decoded realtime as it was sent. Once the image was complete, there was a distinct code for ending and then the radio fell silent.

We looked at the phone and had a perfect image! We saved it, and then wondered 'what now'? There were approximately four minutes left in the pass. We waited for two minutes, while still tracking the ISS,

and then the now familiar melody began again – Yes! We were able to successfully download the second image before the ISS went over the horizon and out of range. On this first pass, we were able to get image #12 and image #1. For the five minute ride home, we were both giddy with excitement as this was something completely new to us! We just received our first communication from Space!

The second pass was Sunday morning at 5:53am... Both girls were game, and so, before dawn, we headed back to our chosen parking lot. We arrived at the same time as the rain. We were not going to let rain stop us! I elected to run the antenna. I held the antenna and passed the coax through the window and the girls held the radio and the phone. I had to rely on the phone since the sky was completely overcast. The signal jumped from the radio and we were off to the races once again. I focused on holding the antenna, the phone and an umbrella all while trying to keep the antenna pointed at the ISS which I could not see. The first image appeared and the now familiar two minute wait began. I repositioned the antenna for the second image and the code began to sing out of the speaker. At some point during the second transmission, I caught a glimpse of lightning from the corner of my eye. I thought to myself “I’m going to die holding this metal antenna up to the sky while it is raining: Lightning is going to get me this morning!” Luckily, the lightning did not zap me and we were able to download the second image. During this pass, we were able to capture image #8 and image #9.

The third pass was Sunday night at 8:51 pm. We were now accustomed to the routine, and set up quickly and decoded a partial and two full images on this 6 minute pass. We received a partial of image #5 and full images of image #6 and #7. Abbi, KF5BEW, ran the antenna and Kendra, KF5FYS, ran the radio and decoding app.

The fourth pass was only predicted to be of 1 minute duration, but hey, ‘what do we have to lose’? So back to Stines at 10:32 pm Sunday night. We set up earlier than the app told us because we were finding the transmission was being heard almost two minutes before the ISS came over the horizon. Even though the pass duration was short, we managed to download image #5 and #6.

The fifth, and final, pass during the time the images were being transmitted was Monday morning at 5:01 am. We were back at the parking lot at five ‘til and ready to give it one more shot. We patiently waited with the antenna pointed towards the horizon. The familiar melodic tune started to come through the speaker although it was weak and scratchy. The image was decoded and it was a partial of #2. We waited for two minutes and then the transmission came in loud and clear. Image #3 and image #4 were downloaded with success.

We were able to download 9 of the 12 images. All three of us had fun experimenting with SSTV and the ISS. We will definitely be looking forward to the next time the ISS decides to send us mere earthlings more pictures from Space. If you would like to see the entire series of the images that were transmitted, you can go to: ariss-sstv.blogspot.com