

## ThumbSats are GPS Equipped!

One of the most exciting features of the ThumbSat satellite is the fact that each satellite has its own built in GPS receiver.

That may not sound like much in a world where most cell phones and consumer devices have a GPS built into them, but when international law comes into effect, things get trickier. Consumer GPS devices have limits built into them where they will not function if the device is going faster than a certain speed or higher than a certain altitude. After all, we don't want people building a missile using their fitness tracker!

That works fine for a car navigation system on the ground, but not for a satellite trying to locate its position in space 400km above the Earth, while moving 17,500 mph.

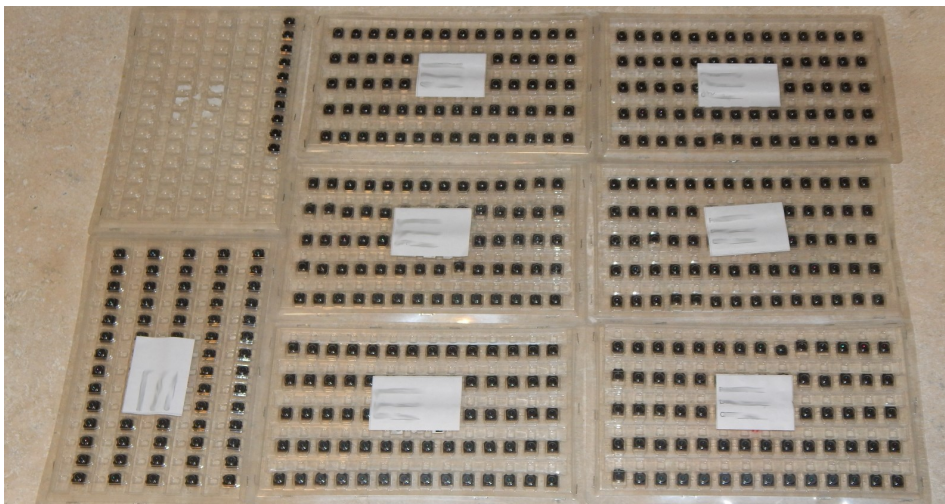
ThumbSat has spent over a year working with government and industry groups to get appropriate permits to legally waive these limits and have hardware manufactured that will allow the satellites to know their exact location in orbit.

Now, ThumbSat has the ability to do things like take measurements or transmit data in very specific locations, which increases efficiency and prolongs mission life.

It's another example of how ThumbSat strives to be the most functional FemtoSat available!

*"Bettyhill Enters The Space Race!"*

*- ThumbNet Station TN104,  
Thurso, Scotland*



Straight from the manufacturer... 500 itty-bitty cameras for our itty-bitty satellites!

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Rank	Username	Joined	Last Seen	Days Feeding	ADS-B				PILOT				Nearest Location
					Aircraft Seen		Positions Reported		Aircraft Seen		Positions Reported		
					Total	Daily Average	Total	Daily Average	Total	Daily Average	Total	Daily Average	
1	<a href="#">Kurt1000</a>	29-Sep-2015	Live	30	35,317	1,177	5,161,508	172,050	50,704	1,690	8,695,039	289,834	College Park, MD, United States ( <a href="#">KCS</a> )
2	<a href="#">LitterBug</a>	05-Feb-2015	Live	30	33,560	1,118	3,315,089	110,502	56,175	1,872	14,925,903	497,530	Columbus, OH, United States ( <a href="#">K72B</a> )
3	<a href="#">hike</a>	24-Aug-2015	Today	29	72,079	2,485	24,520,647	845,539	0	0	0	0	Amsterdam, Netherlands ( <a href="#">EHAM / AMS</a> )
4	<a href="#">hpsks</a>	31-Oct-2015	Live	30	32,763	1,092	3,183,463	106,115	51,235	1,707	8,137,577	271,252	Circleville, OH, United States ( <a href="#">KCYO</a> )
5	<a href="#">gdy</a>	16-Apr-2015	Live	30	69,496	2,316	11,283,366	378,112	15,213	507	1,667,224	55,574	Lille, France ( <a href="#">LEGG / LIL</a> )
6	<a href="#">Terry Pavlick</a>	06-Oct-2013	Live	30	39,357	1,311	1,564,935	52,164	0	0	0	0	Wildwood, NJ, United States ( <a href="#">KWD</a> )
7	<a href="#">frank Dee</a>	12-Jan-2016	Live	30	42,488	1,416	5,364,967	178,832	0	0	0	0	Philadelphia, PA, United States ( <a href="#">KPH</a> )
8	<a href="#">kb8qho</a>	19-Aug-2015	Live	30	32,861	1,095	4,272,337	142,411	54,354	1,811	8,702,749	290,091	Moundsville, WV, United States ( <a href="#">KMPG</a> )
9	<a href="#">Purdue TrafficLab</a>	03-Jun-2015	Live	30	33,264	1,108	4,197,787	139,926	47,818	1,593	6,419,515	213,983	Indianapolis, IN, United States ( <a href="#">KIND</a> )
10	<a href="#">FlightBroadcast</a>	18-Jul-2015	Live	30	35,731	1,191	5,141,371	171,379	50,225	1,674	17,391,910	579,730	Philadelphia, PA, United States ( <a href="#">KPH</a> )

Karl Litterer is ranked #2 in the world for capture of ADS-B Signals.

## What Else Can You Do With ThumbNet Hardware?

The hardware that we have chosen to use with ThumbSat and ThumbNet has all been selected to be user friendly, cost effective and most importantly...versatile.

Our good friend Karl Litterer is using his custom-built ThumbNet dongles to monitor and track aircraft ADS-B signals in his hometown of Columbus, Ohio, USA.

To quote Karl directly:

"Thanks for the update on the ThumbNet dongles. I have been using them 24x7 to receive ADS-B flight traffic for feeding Flightaware. The ThumbNet dongles have performed just as well if not better than the higher priced R820T2 dongles I have tested. Having the F connector has also greatly simplified my configuration. My main feeder is consistently ranked in the top 10 out of over 6,000 in the world based on 30 day collection stats. (See <http://flightaware.com/adsb/stats/> and look for LitterBug)."

As you can see in the image above, Karl was ranked #2 in the world when we wrote this article!

The plans to build a simple ADS-B antenna and the software to capture the signals can be found in the ThumbSat Virtual Classroom.

What can you do with ThumbNet hardware?

## Lab Out Loud!

Shaun Whitehead, Commander of the Kingdom of ThumbSat, was featured in a podcast via Lab Out Loud, talking about, of course, ThumbSat!

If you missed it, click [here](#).

Thank you Lab Out Loud for featuring us!



Show some love and shop for decals [here](#)!



## Parallel 58

Marc, from Thurso, Scotland, reached out to us as a means to get his community involved in the ThumbNet project.

"I want it to be something that the community can become involved in," he said. "We have a non-profit facility in the village called the TeleCentre, which provides electronic services, computer access, council services, and all manner of other stuff. That will be our installation location, whilst we will be forming a small group of students at the school to assemble the hardware and oversee its installation and operation. This way the whole community can benefit from the experience...we don't normally get much in the way of exciting news up here, so 'Bettyhill Enters The Space Race' would no doubt make a great headline."

We couldn't agree more, Marc! This is exactly what ThumbNet hopes to do: promote science, technology, engineering, art and mathematics in students, university groups and citizen scientists, young and old, around the world!

Welcome to ThumbNet!



Marc, Parallel 58, Scotland

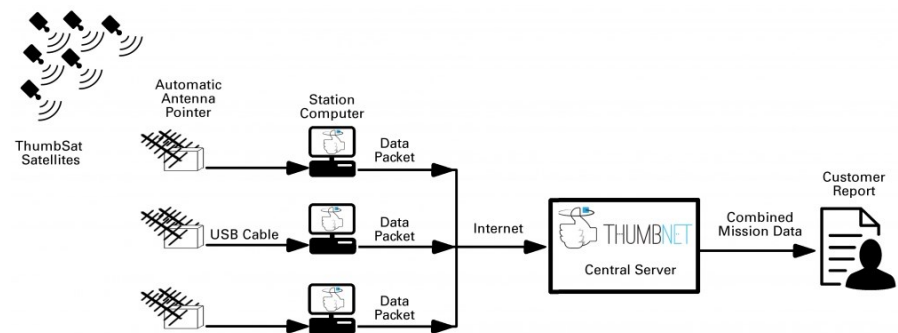
## ThumbNet Wants You!

ThumbSats in orbit will be transmitting their data back to the ground. A single station can only receive signals from ThumbSat for roughly 6 to 10 minutes due to its motion in orbit. That is just not enough time to get all of the mission data!

By locating strategically placed stations around the world and linking them together through the power of the internet, we have created a global network to remain in constant communication with the ThumbSats. Want to join in the fun?

All that is needed is a computer with an internet connection and a few square meters of space on the roof of a building or ground to mount the tracking station. Download the software from our website, build the antenna, and you are good to go!

Learn more about ThumbNet [here!](#)

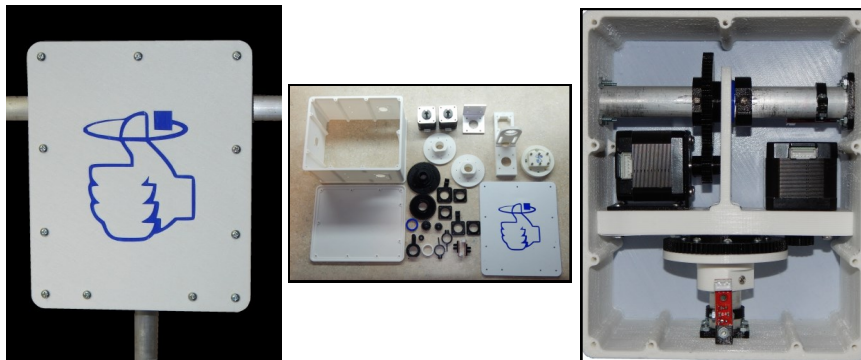


# ThumbPointers Are Coming!

We are in the final stages of producing our automatic tracking station, the ThumbPointer! Used with an antenna built by the participant, the tracker is capable of rotating 360 degrees or pointing 0 to 180 degrees in elevation, perfect for following ThumbSats or any other satellite that might be passing overhead!

A special thanks goes out to Liam Smith at the University of Leeds, England, who engineered the design! While we were inspired by other, existing designs, we really needed something customized for ThumbSat. Liam helped bring our vision to fruition!

Do you have access to a 3D printer and want to print your own? We have made the files open-sourced and they can be found [here](#)!



ThumbSat: Unlocking Space for Everyone!

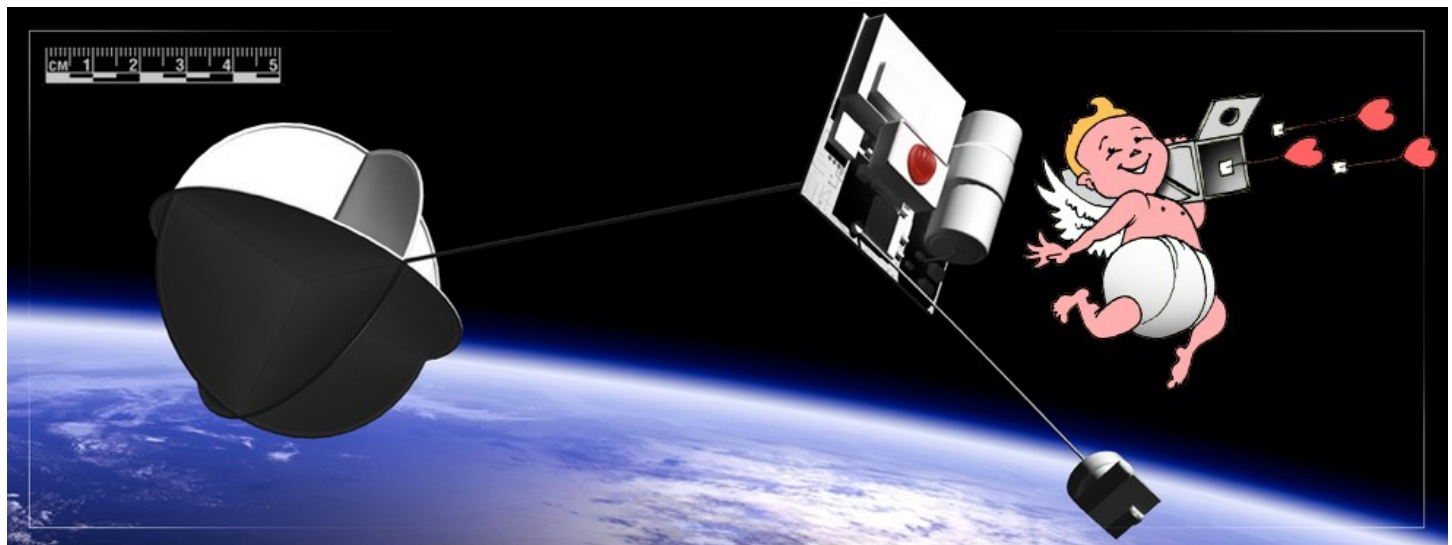
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**Cupid launching messages of love via ThumbSat!**