

DEMO RADIO TELESCOPE

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The aim of the demo radio telescope is to pick up radio sources in the sky and on the ground – the Sun, satellites, and thermal body radiation can be detected.

This little radio telescope was built in a couple of days from an old satellite dish, a bearing from a broken kitchen stool and scraps of wood. The only item purchased was the signal meter at a cost of R300.

It is based on the Itty Bitty Telescope that can be read about on the internet.

The telescope drew a good amount of interest, probably because it is easy to show how it works. The signal meter has an audio signal that catches attention and increases in volume when pointed at the sun, or a satellite, or even a person.



Other things people liked about it was that it was simple, it was a different use of something familiar and it could be moved around by anyone and so was interactive.

More details are available on the internet, or by request from jeremy@anylogos.co.za

A few more details

- 1 This demo radio telescope picks up signals in the frequency range about 12000 MHz;
- 2 The frequency range is the one used by satellite TV (Ku band) – and is a very small part of the whole radio spectrum;
- 3 This telescope will detect radio emissions from...
 - The Sun
 - Trees, people, buildings (thermal emissions from bodies with a non-zero temperature)
 - Television broadcast satellites
- 4 It is based on the "Itty Bitty Telescope" details of which can be found on the Internet – Google the name or use the following sources as a start...

Sources

<http://radio-astronomy.org/>
<http://nightsky.jpl.nasa.gov/docs/ibtmanual2.pdf>



In construction ...



Right - a pet casts a supervisory eye!

Some points to note...

- a. The mounting fork rotates on an old kitchen stool swivel base. This provides azimuth movement.
- b. Altitude movement is simply from a bar passing through the top of the forks. Note the rod for stabilizing the height at which the dish is pointed.

The final construction



Left - the dish reflects the incoming signal onto the receiver which is at the end of the arm pointing right and is called the LNB.

The dish can be swiveled and pointed to most parts of the sky.

The box on the bottom right of the base houses the power supply (12V output), or alternatively batteries could be used.

Right - the signal meter with feed from the LNB sensor coming in from the right, and the power lead coming in from the left side.





Left - Another view of the signal meter. Note also the altitude fixing bar and clamp

Right - this unit operates from mains with an AC-DC converter to 12V DC. This is housed in the power supply box. A battery supply could also be used.



Left - the old LNB receiver from the disused satellite dish still works after many years sitting in the junk box. The black string helps to keep the LNB in place and is also useful when aiming the dish.

Right - another "high-tech" aiming device! Just place eye at the notch and squint through the eyelet.



Left - view from LNB back to dish. Note the Perspex squares used to check that the LNB is correctly aligned, and the shadow of the black string.