



Homebrew Group Newsletter
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Compiled by Rob Whitmore
VK3MQ

In recent times several amateur radio satellites have been launched with uplink frequencies in the 23cm band. This poses a few challenges particularly if circular polarity is desired and accurate phasing harnesses are to be manufactured for yagi antennas.

Fortunately a group of antennas collectively known as helical or helix antennas exist which are both easy to manufacture and adjust, having very broad bandwidth and predictable characteristics.

Interestingly the helical antenna used by radio amateurs for HF mobile is a subset of the group but is referred to as exhibiting the normal mode, whereas the case of interest here is the axial mode.

VK3MQ had been prepared to start construction on a prototype when a friend offered a 21 turn helix designed for the weather satellite band at 1690MHz.

Could this be adapted to 23cm?

The following link provides the design parameters needed to evaluate the problem.

<http://www.antenna-theory.com/antennas/travelling/helix.php>

Of critical importance is the circumference of a turn given by the usual formula $\pi \times$ diameter.

In this case $C = 3.1416 \times 59\text{mm} = 185.35\text{mm}$

Using the formula: Lowest Wavelength = $C \times 4/3 = 247.14\text{mm}$ and converting this to frequency gives 1213MHz. So it is possible!

Using another formula from the link suggested that the feed point impedance would be about 90 Ohms and this agreed with the measured SWR of 1.8 to 1.

Attaching a small tab of shim copper, as shown in the photograph, brought the SWR down to 1.1 to at 1267 MHz, the target frequency.

Rising to only 1.25 to 1 at 1296MHz this antenna could be used for terrestrial communication, as well, on both the SSB and FM segments of the band.

The small tab and the segmented portion of the first turn for a conventional “L match” that would be familiar to most HF operators.



A useful on line calculator:

<http://www.csgnetwork.com/antennahtcalc.html>

Six meters brought many interesting contacts over the last summer season one of which was with ZL1UJG. This website includes a newsletter compiled, over many years by him, which includes some neat homebrewing.

<https://www.qsl.net/zl1ujg/>

More from ZL.....

<https://www.zl2pd.com>

WARNING! Nostalgia alert

<https://www.nzeldes.com/Miscellany/SSB-rig.htm>

Magnetic loops and other things.

<http://www.g4fon.net>

You can drop a microphone just so many times before it bites the dust forever.

<https://m0ukd.com/mods/yaesu-mh-31-electret-condenser-mic-modification/>

Lots of on line calculators and projects.

<https://www.changpuak.ch/electronics/>

Valve datsheets.

<https://frank.pocnet.net>

The geostationary satellite, launched last year by Qatar, is now operational and although not contactable from VK there is a web SDR offering a window into its activity.

Many interesting conversations can be heard relating to the amateur homebrew earth stations.

<https://eshail.batc.org.uk/nb>

Thinking about 3D printing?

<http://www.pa3hcm.nl/?p=1437>

An Arduino based antenna switch.

<http://www.ok2wy.com/en/2017/11/06/automatic-antenna-switch/>

A QSL CAD package that will accept data from electronic log books

<http://qslmaker.ares-mi.org>

An interesting transverter for six meters when you only have 2N2222's in your junk box. It could be used for FT8 or WSPR as well.

<http://www.k8iqy.com/qrprigs/2n26/2n26page.htm>

A host of very well documented projects. Some links are no longer valid.

<http://www.kg4jjh.com>

Finally something to think about:

“Don't worry if plan A fails, there are 25 more letters in the alphabet.”

73's

Rob VK3MQ

