



6 METERS

The Magic Band

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Introduction

- The six meter band (50-54 MHz) is the lowest frequency band in the VHF spectrum and there are reasons that it is called the magic band. It shares some characteristics with the HF band, and can be both exciting and infuriating at the same time.
- Early on the six meter band was noted by amateurs as erratic. My father, licensed in 1935 (VE4ACN), had stories of working Texas from Winnipeg on the old 5 meter band (56-64 MHz) using a homemade transceiver using a model '19 tube (maybe 1 watt CW), something that usually only made it across town.
- What makes the 6 meter band magic, is the diverse modes of propagation possible, which are quite different from the higher frequency VHF bands. Although the talk isn't intended about propagation, in order to get the most out of the band you need a few basics

Line of sight Propagation

- Simply put when one antenna can “see” the other. The earth curves, and so does the radio wave, so if you want to plot this often you will use a 4/3 earth model. But all you really need to know is the most you will get from this form of propagation is at best 50km and that is mountain top to mountain top. This mode of propagation is omni-present, and reliable.

Tropospheric Propagation

- The troposphere can refract back some of the radio energy. Lower than the ionosphere, means you will not go as far but 1000km is doable. Usually caused by weather fronts such as along a warm front, you can also get a phenomenon known as ducting. Here in Montreal we are at one end of the St Lawrence valley, on a cloudless night in the summer, when the air is still, cold air will fill the valley leaving warm moist air above causing an air inversion, the transition between the layers and reflections from the water, strong signals are possible all the way to Toronto. I have seen similar ducting on the east coast caused by reflections from a fog band and the water (like a waveguide). Both phenomenon can last from minutes to an hour. Mostly they are predictable refer to Hepburn tropo index. <https://www.dxinfocentre.com/tropo.html>

Ionospheric Propagation: Sporadic E

- For whatever reason, these lumpy bits of ionization occur around the equinoxes May-June and Dec-Jan (early), for some strange reason they can even occur at night. A “double hop” is common particularly North south, Florida is easily doable. 600 - 2300 Km is the normal range possible. Unfortunately they are not predictable, when they happen the band becomes frantic. A little bit like a contest with an unknown start time. Although the sporadic E layer is unpredictable it will become more common and lasting longer as the solar flux increases as we enter into a new sunspot cycle once the solar index increases above 200 it becomes more predictable, and will occur more frequently.

Other types of Ionospheric propagation

- Other types of Ionosphere propagation are possible; Auroras will reflect radio waves but their rapidly changing characteristics make it useless except for CW and some digital modes such as FT8. Another possibility is meteor scatter, as meteors enter the atmosphere they leave an ionized trail behind them, short lived if you want to use voice but digital modes such as FT8 work. Something to consider during the Perseid, Orionid ,and Leonid meteor showers (Aug 12-13, Oct 21-22, Nov 17-18 respectively).

How to determine if Sporadic E occurs

- If you listen to the band, unless you are lucky, it will be very quiet, frequently there may be an FT8 signal in Montreal calling CQ (for hours), with no takers then all hell breaks loose for maybe an hour. But there are some things you can do, listen to beacons 50,009.5 VE3WCC near Ottawa, 50,033 VE2RCS in Lachute, 50,078 N2GHR in New York. They will tell you that conditions are improving by watching their signal strengths.
- However, rather than tying up your receiver, there are excellent web sites available; dxmaps.com (EA6VQ) shows clusters as they develop, and can send alerts if you want to subscribe, dxwatch.com (PY1NB) is another excellent site.

Equipment

- Most HF sets have 6 meters built in now, myself I only started experimenting with the band after I replaced my aging IC-765 (which did not have 6 meter capability).
- Next you will need an antenna, a simple dipole works well for the 6 band particularly digital modes and it isn't physically large. You will need to mount its high as you can get it. You will also need to rotate it. Also look at cable losses which can get significant above 30 MHz.
- The band allows CW, SSB, AM, FM, a variety of digital modes, remote control, and experimental modes, so there should be something for everyone. You don't need a lot of power just patience.

What about DX?

- Fred Fish W5FF (sk) was the first amateur to work all 48 Maidenhead grids in the 48 contiguous states on 6 meters and every year the list of those who duplicate his accomplishments grows.
- QST (Feb 2023) reported ZL1RS (RF64) to N9PGG (FM05) Nov 29 at 23:14 GMT running 100W and a single Yagi reporting -7 on FT8. Although sporadic E is rare in November it does occur, don't give up on the band because it seems silent. EME is also possible on 6 Meter with only a dipole, but the other end has to do the heavy lifting (also reported in QST)
- Its all about checking clusters and being patient.