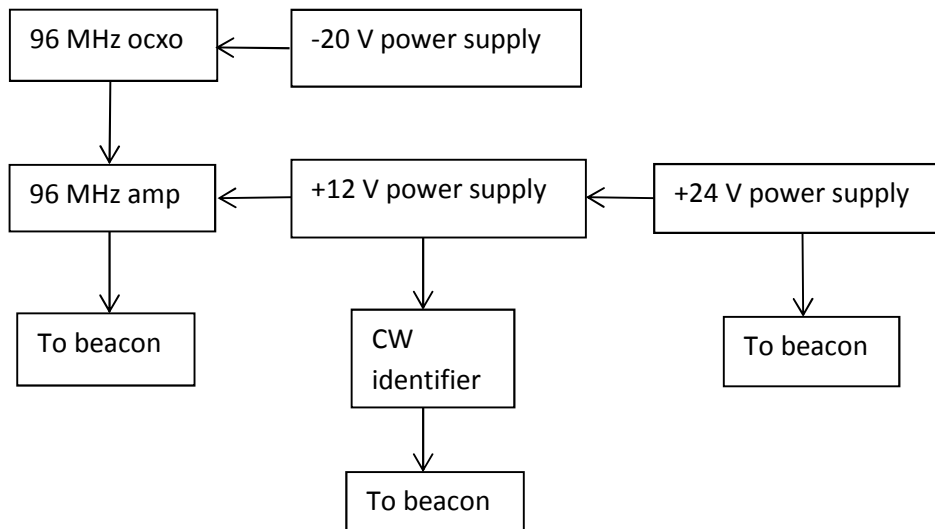


## OLD SCHOOL 24 GHz BEACON Graham Stratford VE3FHM

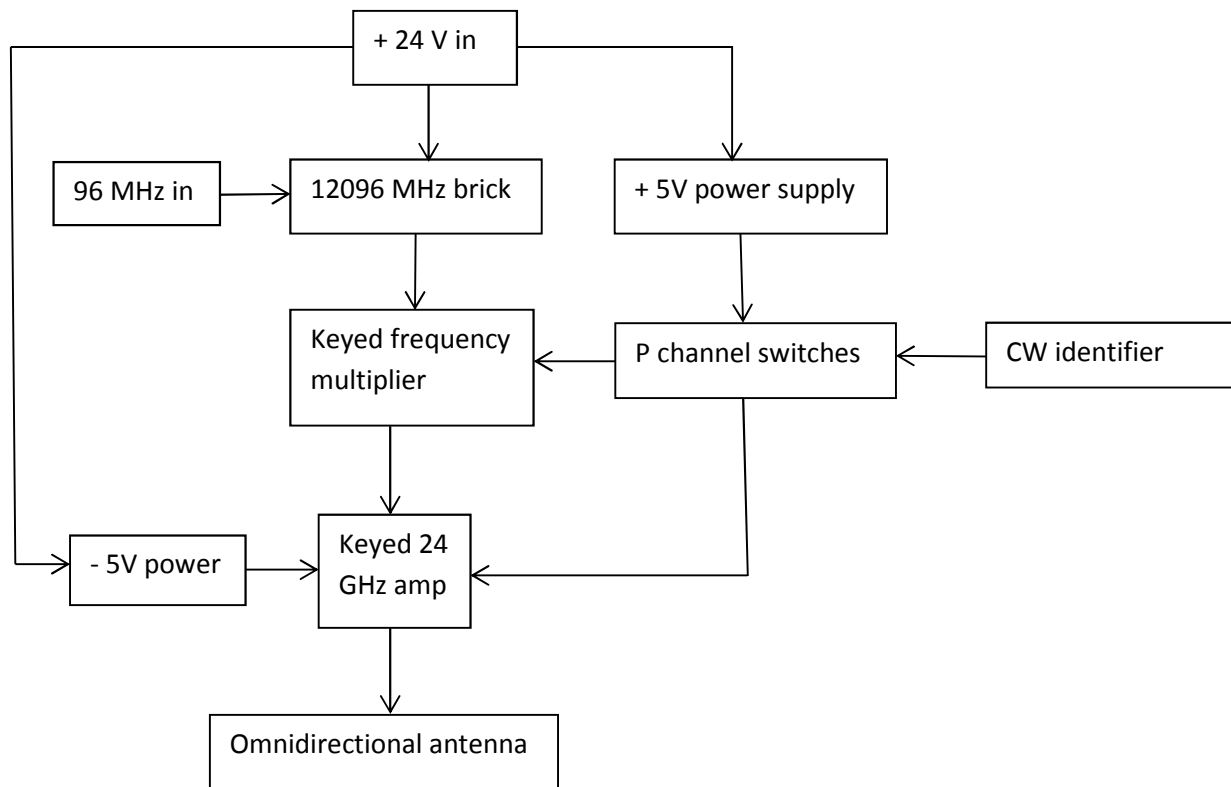
Some time ago a local ham, VA3TO, was asking if anyone had a 24 GHz source. He had the parts for a 24 GHz rig but had not assembled them. I responded that I had been gathering parts for a 24 GHz beacon but had not put them together. I got busy and put my beacon on the air. As a result Hugh put his 24 GHz rig together and has gone on to make QSOs with seven grids. A video of his seventh QSO can be seen at <https://www.youtube.com/watch?v=Gp0xGGAGG9o>. Recently the beacon assisted with a rain scatter contact between VA3TO and VA3ELE [https://www.youtube.com/watch?v=CHF\\_1QYapE4](https://www.youtube.com/watch?v=CHF_1QYapE4).

I call the beacon old school because it relies on bricks for its operation. The block diagram for the control box that is in the shack is as follows:



The 96 MHz ocxo is a brick. I disabled everything but the oven and the oscillator and changed the crystal. The 96 MHz signal is fed by coax up to the beacon. Three wires carry the identifier signal, the +24 V, and the ground up to the beacon.

Here is the block diagram of the beacon.



The + 24 V input feeds a power supply that yields + 5 V and – 5 V. I decided to key the frequency multiplier and the amp to save power and reduce heat buildup.

This beacon works well but there are a few issues. I should replace the power supplies with linear units to reduce noise. Ideally they should be low noise regulators. I chose switch mode supplies in the interest of efficiency. The note of the beacon is clean. There is no chirp or key clicks. Back wave is not noticeable. Here is a video recorded by VA3ELE/P <https://www.youtube.com/watch?v=ef62GyfOsdI>. I do note spurs on both sides of the desired output. Short term frequency stability is good but in the long term the crystal frequency creeps higher. I am not surprised by this because the 96 MHz signal is multiplied 252 times. Note that in the video the frequency is 24192.348 MHz. Now it has moved up to 24192.365 MHz in just under one year. The call sign is VA3BKN/B.

This beacon is my first attempt. The beacon is about 40' up the tower so is at 840' above sea level. I would like to find a site that is higher as coverage is limited to about 20 Km. An up converter approach would work better but would require a complete rebuild. Also an IF transmitter would have to be committed to the beacon. If you have any comments or questions please email me at [gstratford1@cogeco.ca](mailto:gstratford1@cogeco.ca).