

The Latest

HackRF One - 5 band beacon

Up

Posted by AG6QV Frank

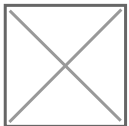
Tags: [2m](#) | [GNU Radio](#) | [HackRF One](#)

Radio Beacons are used in HAM radio to test propagation. If you are able to receive a beacon on a given frequency you might also be able to make contacts with stations in the same area as the beacon, and on frequencies close by. Beacons can also be used to test antenna and receiver performances. Setting up test beacons for one or many HAM radio bands can be a large task. With HackRF One and Software Defined Radio (SDR) it can be a much easier task.

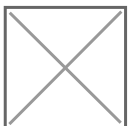
I have created a simple flowgraph that can select between 5 preconfigured frequencies on 6m, 2m, 70cm, 33cm, and 23cm. The flowgraph also includes a variable to define the beacon message. The message is a series of characters that will be translated into morse code when the program is launched.

Translation into morse code required the use of a custom block in GNU Radio Companion. Custom blocks can be written in Python and are relatively simple to get custom functionality into the flowgraph.

The image below shows the flowgraph with variables on the top and the logic at the bottom. I included a frequency sink to show where the signal is when the different frequencies are selected and to visualize the CW code.



The next image is a screenshot of the application running. The maximum output of HackRF One is 10-15dbm or 10-25mW so a small amplifier and an external antenna might help. In addition a valid HAM radio license is required to transmit any signal in the HAM bands.

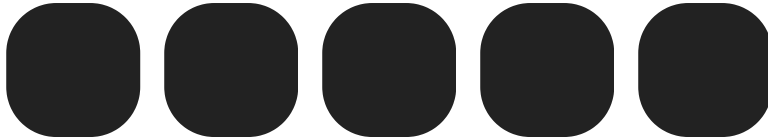


Download the [flowchart](#).

Update:

I made a new version of the [flowchart](#) for the multiband beacon. It now operates on 6 bands: 6m, 2m, 1.25m, 70cm, 33cm, 23cm. It can work on any number of bands/frequencies where each frequency is defined as an element in an array within the custom block that generates the CW code. It will automatically switch to the next band after completing a full transmission of the CW message.

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[April 2023 {1}](#)

[March 2023 {1}](#)

[January 2023 {2}](#)

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[2m {3}](#)

[GNU Radio {5}](#)

[HackRF One {4}](#)

[HAM {7}](#)

[HF {2}](#)

[PNW Microwave {1}](#)

[X-Band {1}](#)

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April 2025					
Su	Mo	Tu	We	Th	Fr
		Sa			
		1	2	3	4
		5			
6	7	8	9	10	11
		12			
13	14	15	16	17	18
		19			

20

21

22

23

24

25

26

27

28

29

30