

Dual 6088 Franklin VFO

Written by Hans Summers

Wednesday, 23 May 2012 13:19 - Last Updated Monday, 22 December 2014 06:43

Now for what I always wanted to try, a tube Franklin VFO! Even better, using sub-miniature tubes. The Franklin oscillator topology uses two tubes, and a pair of very small capacitors to couple the tuned circuit to the amplifier input and feedback. The capacitors are supposed to be as small as possible but still allow reliable oscillation. This isolates any nasty effects such as loading and variations in capacitance in the tube from the tuned circuit, and keeps the tuned circuit Q high. Theory says that this produces a very very stable oscillator - we shall see.

Not much is written about Franklin VFO's, even less about tube Franklin oscillators, and nothing at all about sub-mini tube variants. Some useful links:

- 1) [QST July 1964 article by Walter Horn, I1MK](#)

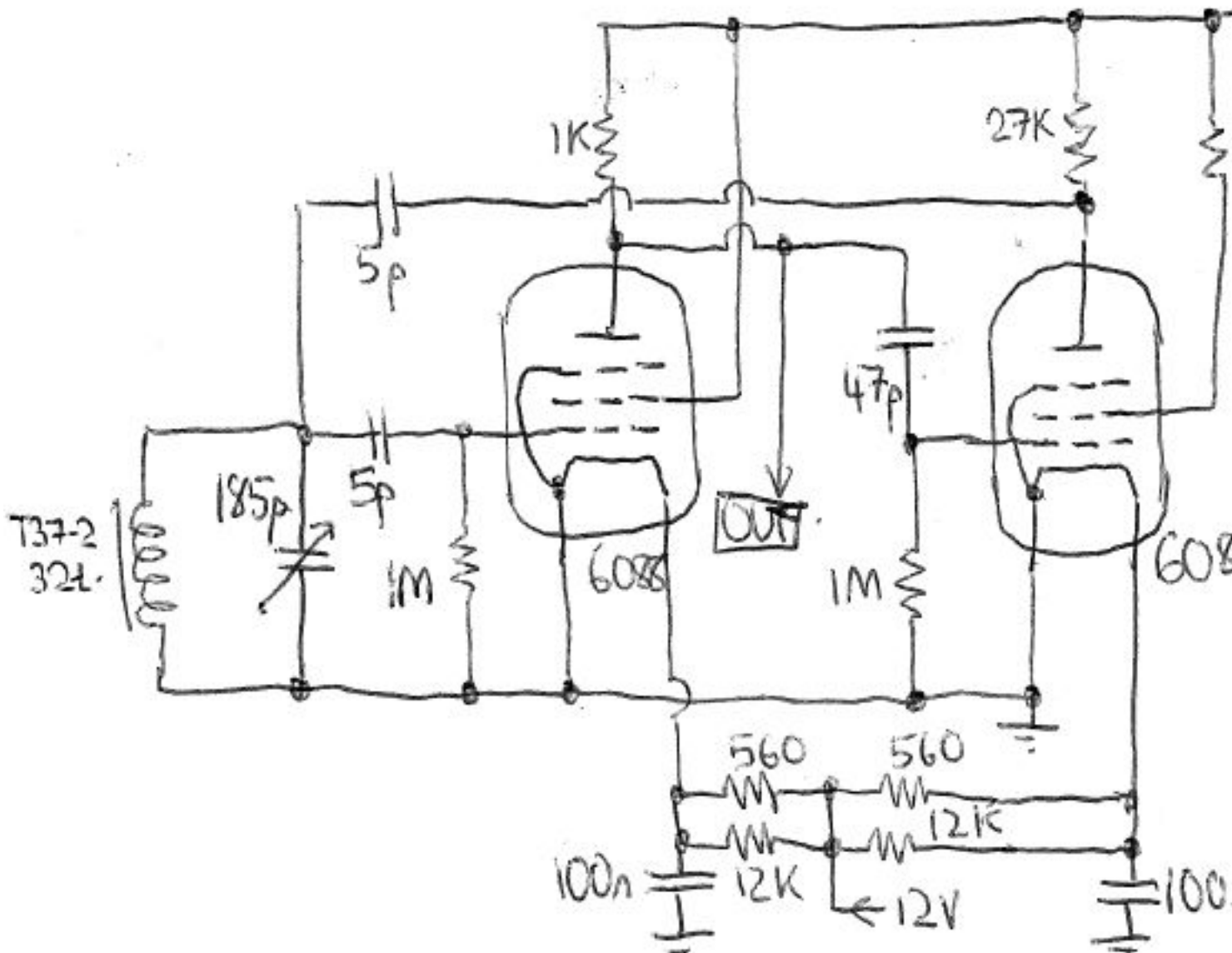
- 2) [2x EF80 160m Franklin VFO by F6FKN](#)

The circuit I ended up with is below. Note that in a Franklin oscillator the cathodes are grounded. This is really perfect for battery valves, which are directly heated i.e. the filament IS the cathode! No need for RF chokes etc. I used my [12V regulated power supply](#) and some series resistors, to get 1.25V 20mA for each of the tubes.

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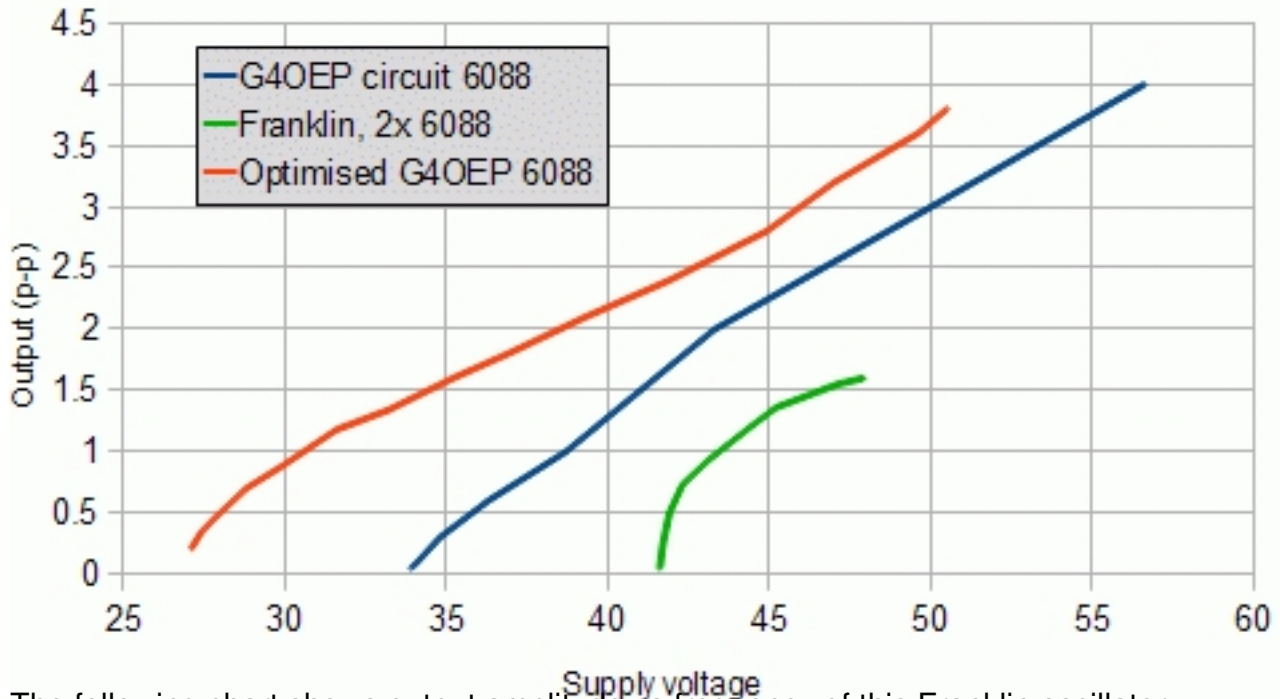


~~Hand-drawn circuit diagram of the Franklin VFO and how it is used. The circuit is powered by a 12V supply through a 100nF capacitor. Various resistors and capacitors are used for biasing and tuning, including 1K, 27K, 1M, 47pF, 560, and 12K components.~~

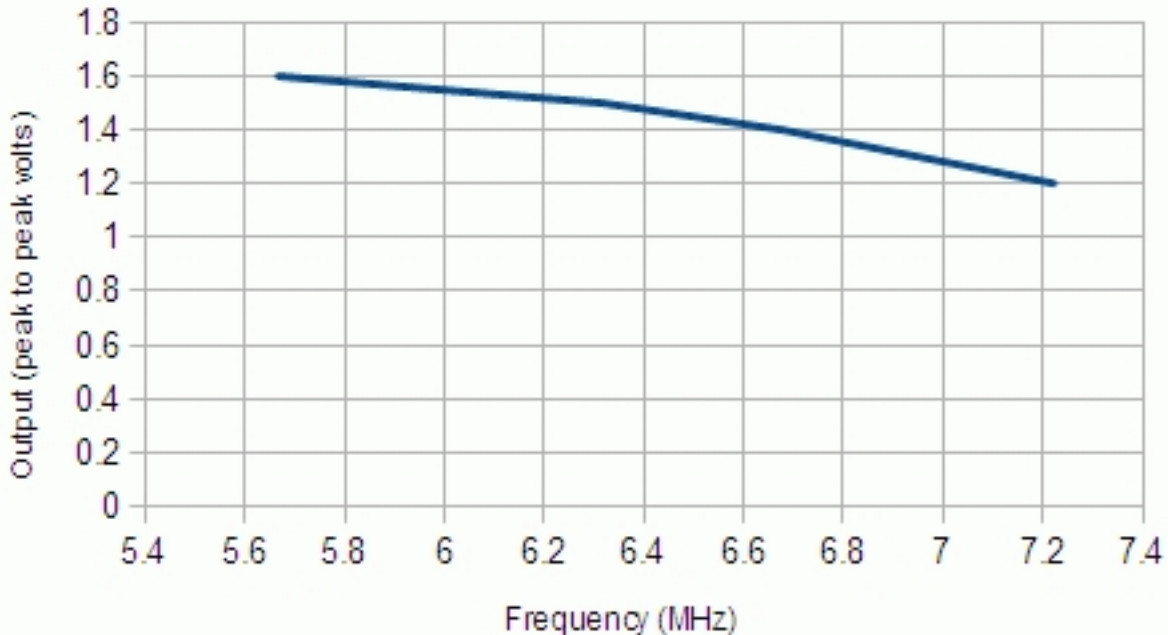
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The following chart shows output amplitude vs frequency of this Franklin oscillator



Before working on the terminals and before [ready](#), I'll put this oscillator in a box. That's next -