13. Band-Pass Report 40 kHz (and PLL check)

UFO Doctor, Dec. 20th, 2011, rev. Jan 18th, 2012 V1.2

1. Simulation and Experiment

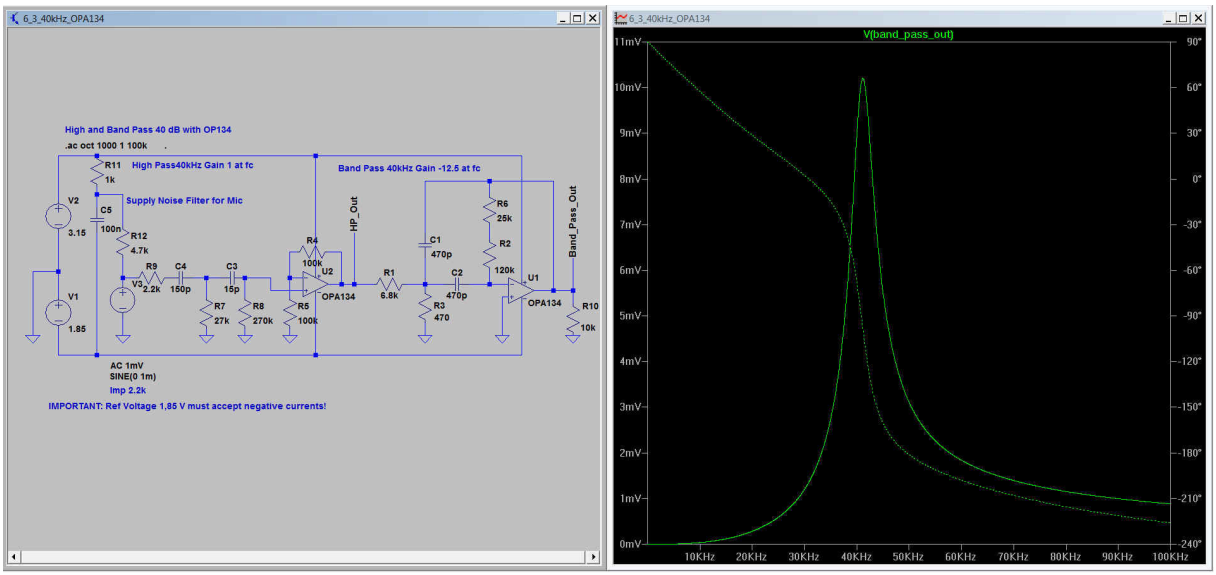

Fig. 1. Simulation V5 dual HP and single BP at 1 to 100kHz,
Gain 12 at fc with OPA2134

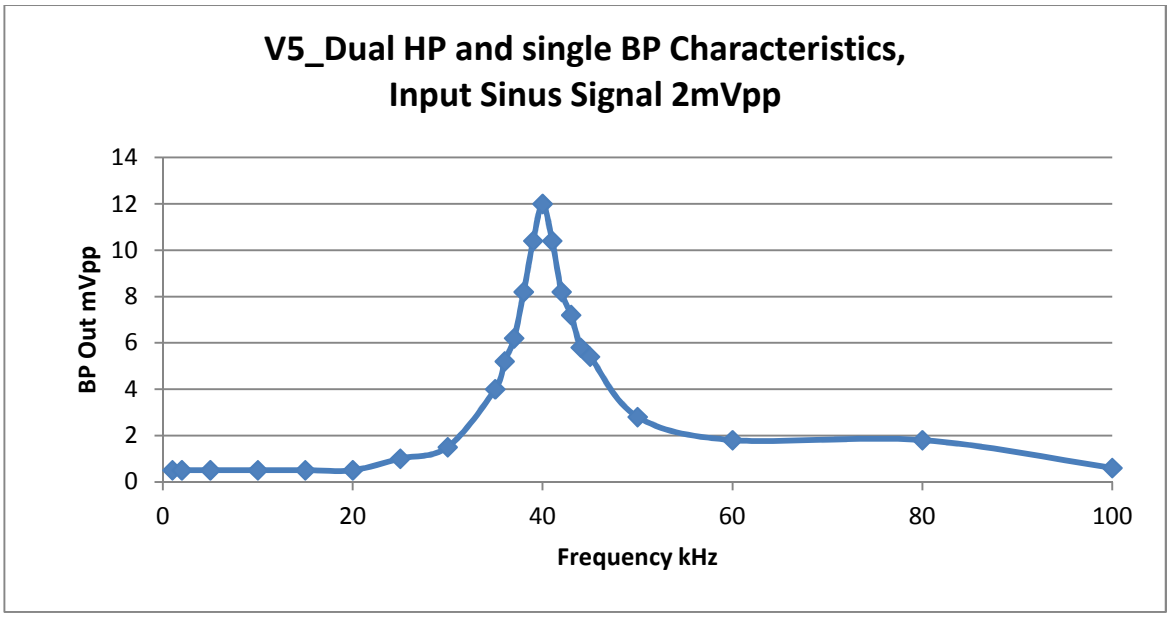

Fig.2. Experimental result with OPA2134 (10MHz, low noise)
Input Voltage: 2 mVpp, output max. 12mVpp

2. Discussion

Calculation, Simulation and Experiment match together.
The OPAMP should show a bandwidth-product of about 10 MHz and not too much noise. The low-cost Opamp MCP6022 might be sufficient.

3. Experiment with same circuit, but with MCP6022

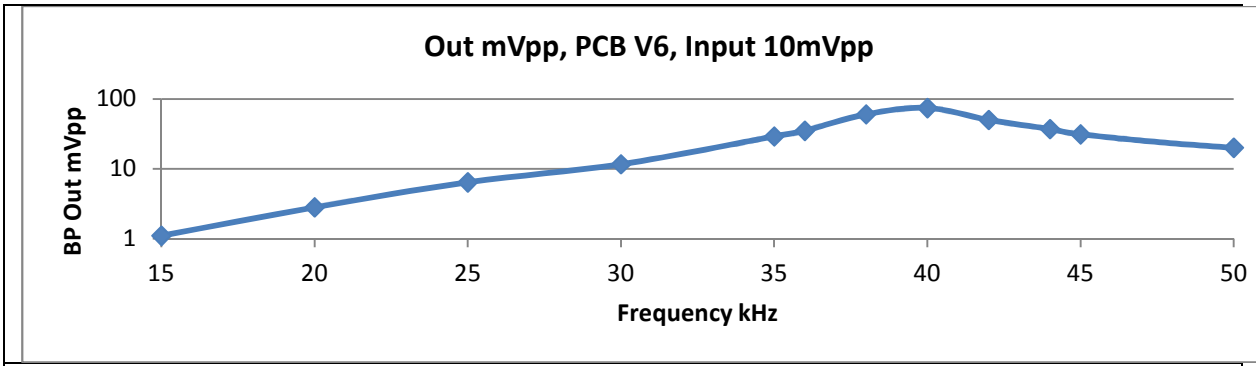

Fig.3. Experimental result with MCP6022 (10MHz, low cost)
Input Voltage: 10 mVpp, output max. 90 mVpp, Gain not perfect but ok
Noise: about 1 mVpp

Additional Info:
R1: 10E
R2: removed (no electret Mic!)
Cx parallel to R5: 100pF (oscillating without?)
R12: 470k
C12: 22pF
Total current consumption at 5V: 8 mA
Voltage loss at R1:17 mV for MCP6022

4. PLL Behavior 18. Jan, 2012

Lower lock in: 38.5 kHz
f1: 39.9 kHz
f2::40.2 kHz
Upper lock in: 41.9kHz

Just perfect for FSK with +/- 2% frequency deviation!