

Neophyte Two Chip Direct Conversion Receiver - VE3OT Version

The original Neophyte Receiver was published in QST, February, 1988, and used the new Signetics Si602 oscillator-mixer chip to directly convert radio frequency signals to DSB audio and the National Semiconductor NE386 audio amplifier chip to provide sufficient signal gain to drive headphones or even a small speaker. This receiver uses an improved mixer chip, the NE612, which is a direct substitution.

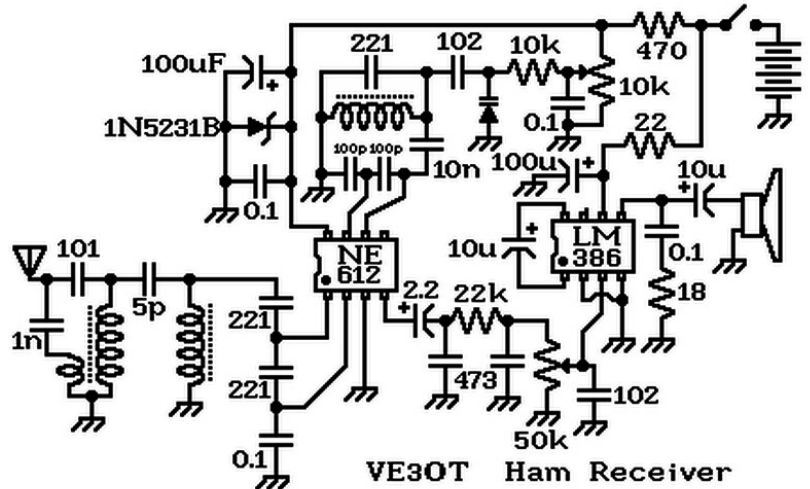
Mitch Powell, VE3OT, modified the Neophyte using parts on hand so that his Fanshawe students could build a simple receiver, gaining circuit building skills while being exposed to the hobby of Ham Radio. Fifteen spare circuit boards and 10.7MHz IF transformers are available for LARC members.

Two 10.7MHz IF transformers are used as an RF pre-selector, tuned down into the 40m ham band by placing about 100pF of capacitance across the main coil winding.

A third IF transformer is used as the Local Oscillator coil, suitably tuned by additional capacitance and a variable capacitance diode, or Varicap, biased by a DC voltage from the 10kΩ tuning potentiometer. Mitch used two common power rectifier diodes, 1N4005, in parallel as a varicap.

Audio from the NE612 is bandwidth limited by a simple C-R-C low pass filter, fed into

the 50kΩ volume control, and then applied to the inverting input of the LM386N audio amplifier. The original Neophyte design used both outputs of the mixer and both inputs of the audio amplifier for improved dynamic range and lower noise, but lacked a volume control.



Component Side Printed Circuit Board View with component layout.

Note that a 0.1uF cap has been added to the LM386 power pin (6) for improved stability.

The Tuning Potentiometer can be a 50K linear for slightly reduced power draw.

For predrilled circuit boards and assistance with this project please speak to Dave, VE3EI.

