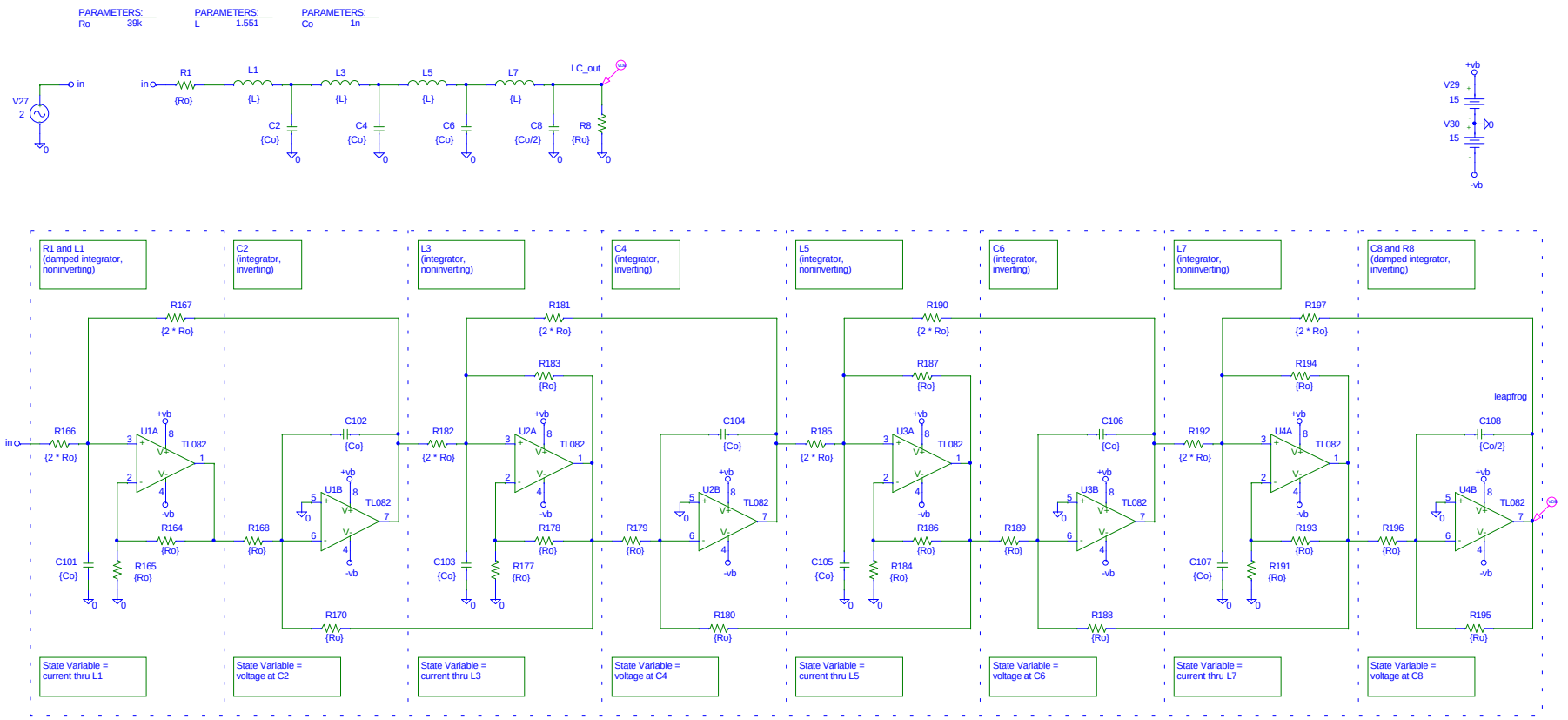

State Variable "Leapfrog" Circuit for emulating an LC LPF
(c) J. Haible 2003
Background: Emulation of Hammond Line Box.
(Example has 4 Inductors, Hammond Line Box has 25 Inductors.)
Inductor currents and Capacitor voltages of LC circuit are chosen as state variables. Each "tap" of the LC filter is also present in Leapfrog circuit.
(Important for Scanning along the Line Box.)
"C"s of LC filter => Integrator with time constant (Ro * Co).
"L"s of LC filter => Integrator with time constant (Ro * Co) = (L / Ro)
Negative polarity of "leapfrog" feedback loops requires inverting and noninverting integrators. (to avoid an extra inverting amplifier)
Inverting integrator is trivial.
Noninverting integrator is implemented by un-damping a passive RC-Lag with a negative impedance converter. ("Deboo-Integrator")
Stability issues of the Deboo Integrator _should_ be overcome by the strong damping via leapfrog feedback loops.
THIS IS UNTESTED! (Works great in simulation, so far.)
25-inductor line box will require 25 dual opamps. Not expensive, but will signal quality be good enough at the end of the chain?