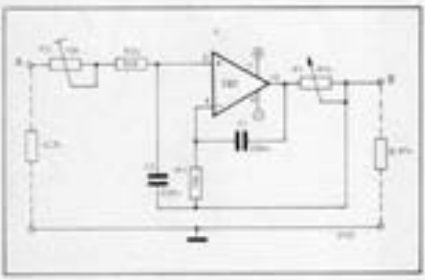
swinging inductor using one op-amp

The principle of simulating an inductor with a capacitor plus a gyrator is well known. With the usual gyrator circuits there is, however, the objection that one terminal of the resulting inductor is connected to circuit earth. A 'swinging' or free-ended inductor can only be obtained indirectly and with some complication. The accompanying diagram shows a swinging inductor that requires two capacitors and one operational amplifier. The inductance appearing between points A



and B is given by L = P1 × τ, where τ = R1 × C1 = (R2 + P2)C2. P2 will determine the 'Q' factors.

The rules of the game are: the external impedance between point A and circuit earth must be less than 2 kΩ, while the load on point B must be roughly equal to the value of P1 (47 kΩ in this case). With the values given in the circuit diagram, the inductance obtained is variable over a range of approximately 1 . . . 100 Henries!