8VoltWerkstatt
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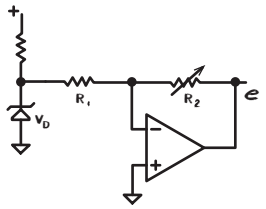
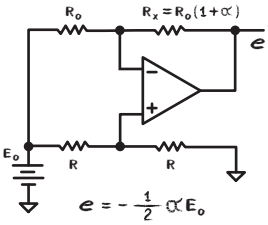
TYPICAL OPERATIONAL AMPLIFIER APPLICATIONS
for MODELLING, MEASURING, MANIPULATING, and MUCH ELSE

PRECISION VARIABLE VOLTAGE SOURCE



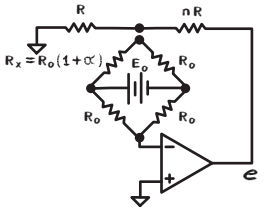
$e = -V_D \frac{R_2}{R_1}$

BRIDGE AMPLIFIER
(ACTIVE BRIDGE, ULTRALINEAR)



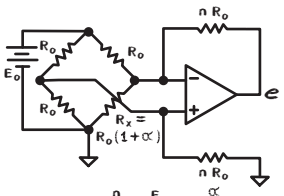
$e = -\frac{1}{2}\alpha E_o$

BRIDGE AMPLIFIER
(FLOATING SUPPLY)



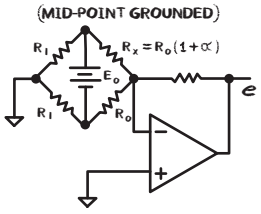
$e = (1+n)\alpha\frac{E_o}{4}\left[\frac{1}{1+\frac{\alpha}{2}}\right] \cong (1+n)\alpha\frac{E_o}{4}$

BRIDGE AMPLIFIER
(ONE END GROUNDED)



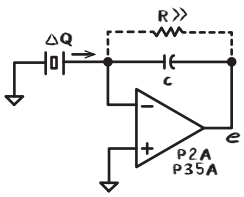
$e = -\frac{n}{2}\frac{E}{1+\frac{1}{2n}}\frac{\alpha}{1+\alpha} \cong -\frac{n}{2}\frac{E}{1+\frac{1}{2n}}\alpha$

BRIDGE AMPLIFIER
(MID-POINT GROUNDED)



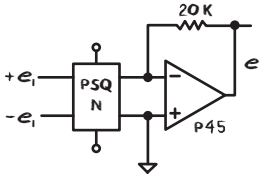
$e = \frac{E_o}{4} n\alpha\left[\frac{1}{1+\frac{\alpha}{2}}\right] \approx \frac{E_o}{4} n\alpha$

CHARGE AMPLIFIER



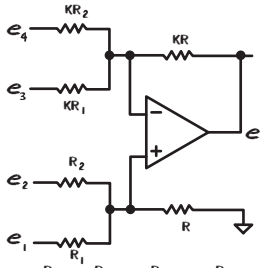
$-e = \frac{\Delta Q}{c}$

PRECIDE WIDE BAND SQUARER



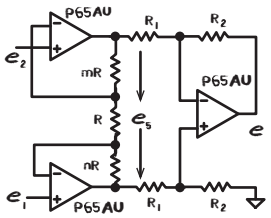
$e = \frac{1}{10} e_i^2$

ADDING SUBTRACTOR



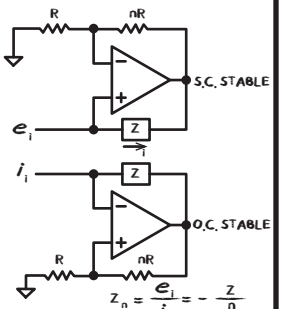
$e = \frac{R}{R_1}e_1 + \frac{R}{R_2}e_2 - \frac{R}{R_1}e_3 - \frac{R}{R_2}e_4$

LOW-COST, LOW-NOISE, HIGH-IMPUT IMPEDANCE DIFFERENTIAL-TO-SINGLE-ENDED AMPLIFIER



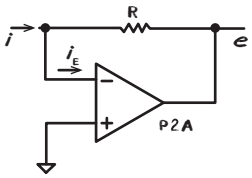
$e_s = (1+m+n)(e_1 - e_2)$
$e = \frac{R_2}{R_1} e_s$

NEGATIVE IMPEDANCES



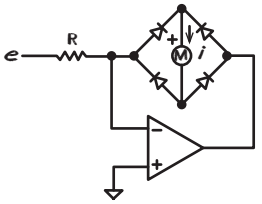
$Z_n = \frac{e_i}{i} = -\frac{Z}{n}$

CURRENT-TO-VOLTAGE TRANSRESISTOR



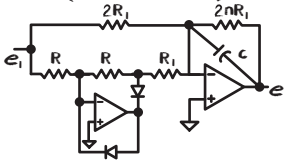
$e = iR$
$i_E < 10^{-11}$ amp
$i_{NOISE} < 10^{-13}$ amp

PRECISION AC-DC CONVERTER
(METER OUTPUT)



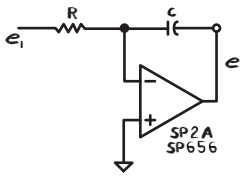
$i = \left|\frac{e}{R}\right|$

PRECISION FULL-WAVE RECTIFIER-FILTER
(AC-DC CONVERTER)



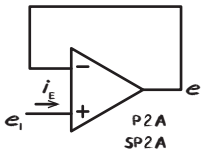
$e = n\left|e_i\right|\left[\frac{1}{1+2R_2cp}\right]$

STABLE INTEGRATOR



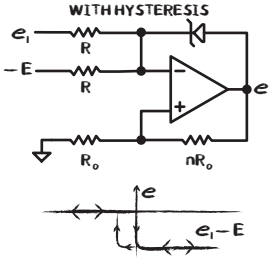
$-e = \frac{1}{Rc}\int e_i\,dt$
$\left.\frac{de}{dt}\right|_{error} < \frac{10^{-11}}{c}$

FOLLOWER
(ELECTROMETER)

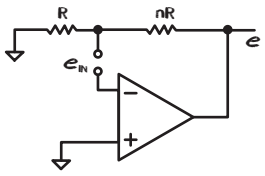


$e = e_i$
$i_E < 10^{-11}$ amp
$i_{NOISE} < 10^{-13}$ amp

PRECISE VOLTAGE OR CURRENT COMPARATOR
WITH HYSTERESIS

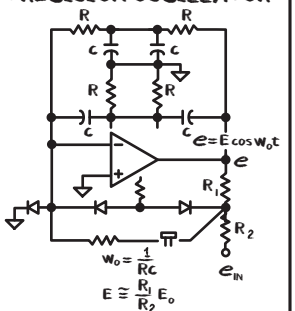


FLOATING SOURCE PREAMPLIFIER



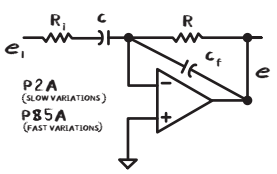
$e = (1+n)e_{IN}$

PRECISION OSCILLATOR



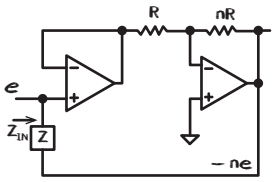
$w_o = \frac{1}{Rc}$
$E \cong \frac{R_1}{R_2} E_o$

STABLE LOW-NOISE DIFFERENTIATOR



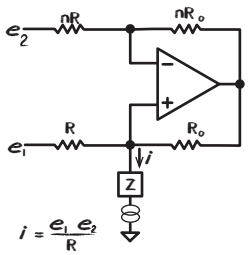
$-\frac{e}{e_i} = \left[Rcp\right]\left(\frac{1}{(1+Rc_fp)(1+R_1cp)}\right)$

IMPEDANCE SCALER



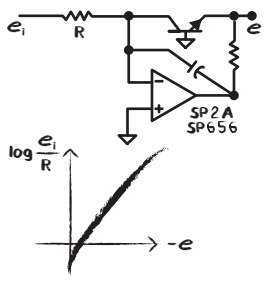
$i_{IN} = \frac{(1+n)e}{Z}$
$Z_{IN} = \frac{Z}{1+n}$

VARIABLE CONTROLLED CURRENT SOURCE

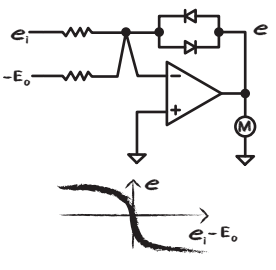


$i = \frac{e_1 e_2}{R}$

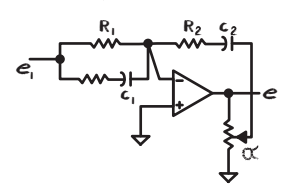
PRECISE WIDE-RANGE LOGARITHM
9-DECADES



GRADED NULL MEASUREMENT

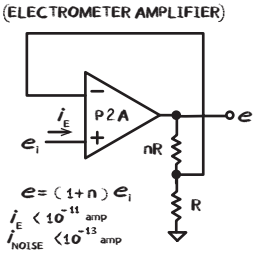


CONTROLLER
(3-TERM)



$-\frac{e}{e_i} = \frac{1}{\alpha}\frac{R_2}{R_1}\left(1+\frac{1}{R_2c_2p}\right)\left(1+R_1c_1p\right)$
PROPORTIONAL INTEGRAL DERIVATIVE

FOLLOWER WITH GAIN
(ELECTROMETER AMPLIFIER)



$e = (1+n)e_i$
$i_E < 10^{-11}$ amp
$i_{NOISE} < 10^{-13}$ amp

For information on any of the circuits shown here consult 8Volt or their representative nearest to you.

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