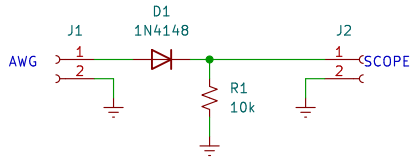
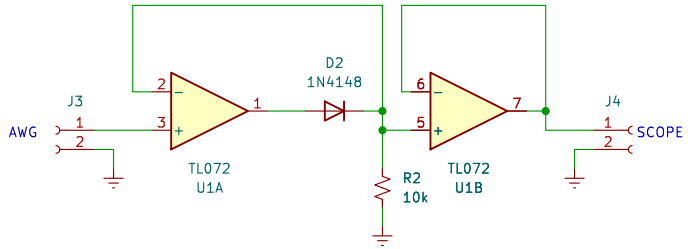
BASIC HALF-WAVE RECTIFIER



Connect signal generator and 'scope.
Observe the diode drop.
Vary source and load resistance. Observe loss of signal strength when load is of low impedance or source is of high impedance.

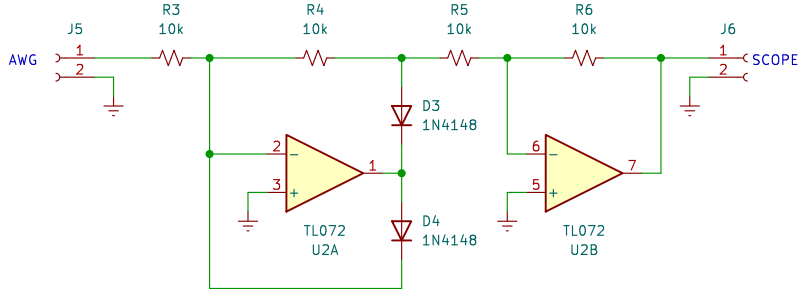
ACTIVE HALF-WAVE RECTIFIER

"Hiding the monster"



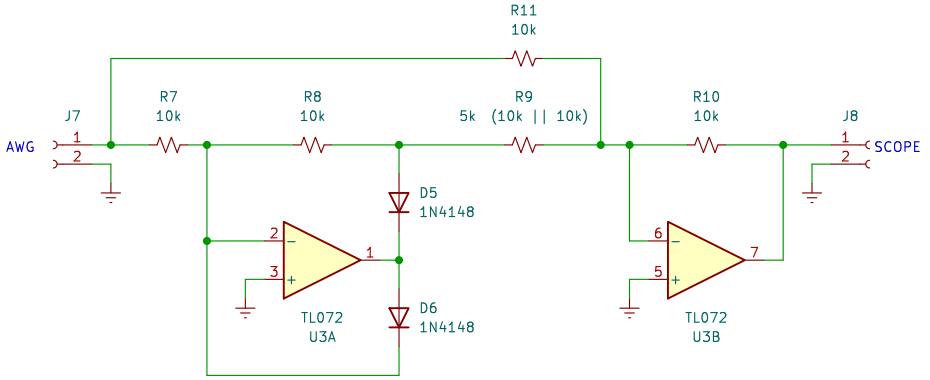
Observe that the diode drop is compensated by negative feedback.
Op-amp output swings to the rail on negative half-cycle.
Output impedance is still high on the negative half-cycle.
Glitches at the positive-going zero crossing because of finite slew rate.

PREVENTING OP-AMP SATURATION



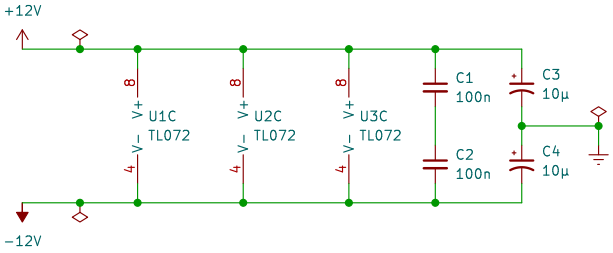
Glitches at high frequencies are much reduced.
Input impedance relatively low. Might need to use a follower after the previous stage.
Output of rectifier is inverting, so output stage is now an inverter rather than a follower.

ACTIVE FULL-WAVE RECTIFIER



Addition of two more equal-valued resistors makes the circuit an absolute-value circuit. Output amp is an adder+inverter.
$V_{in} < 0$: $V_{out} = -V_{in}$
$V_{in} > 0$: $V_{out} = V_{in}$

POWER AND BYPASSING



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