A Precision Full-Wave Rectifier

The half-wave rectifier kept only those parts of the original input signal that were positive (or negative). Is there a way to keep both halves of the input signal, and yet render them both with the same output polarity? This is the behavior of a *full-wave rectifier*.
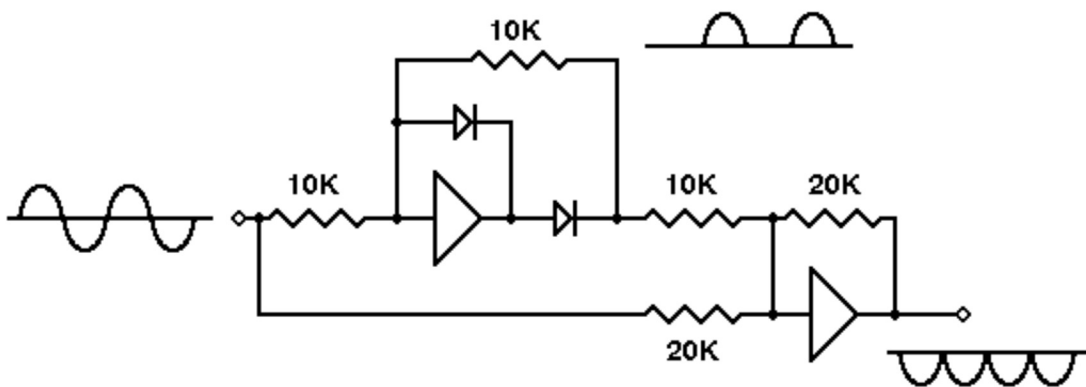
The circuit shown above performs full-wave rectification on the input signal, as shown. If you wish the final output to be positive instead of negative, simply reverse the two diodes in the half-wave rectifier section.

The full-wave rectifier depends on the fact that both the half-wave rectifier and the summing amplifier are precision circuits. It operates by producing an inverted half-wave-rectified signal and then *adding that signal at double amplitude* to the original signal in the summing amplifier. The result is a reversal of the selected polarity of the input signal.

The resistor values shown are reasonable; the resistors themselves must be of high precision in order to keep the rectification process accurate. If for some reason you must build such a circuit with a different set of resistance values, you must maintain the indicated 2:1 resistance ratio, and you must still use precision resistors in order to obtain accurate results.