

Andrew O'Malley

Instrumentation Projects

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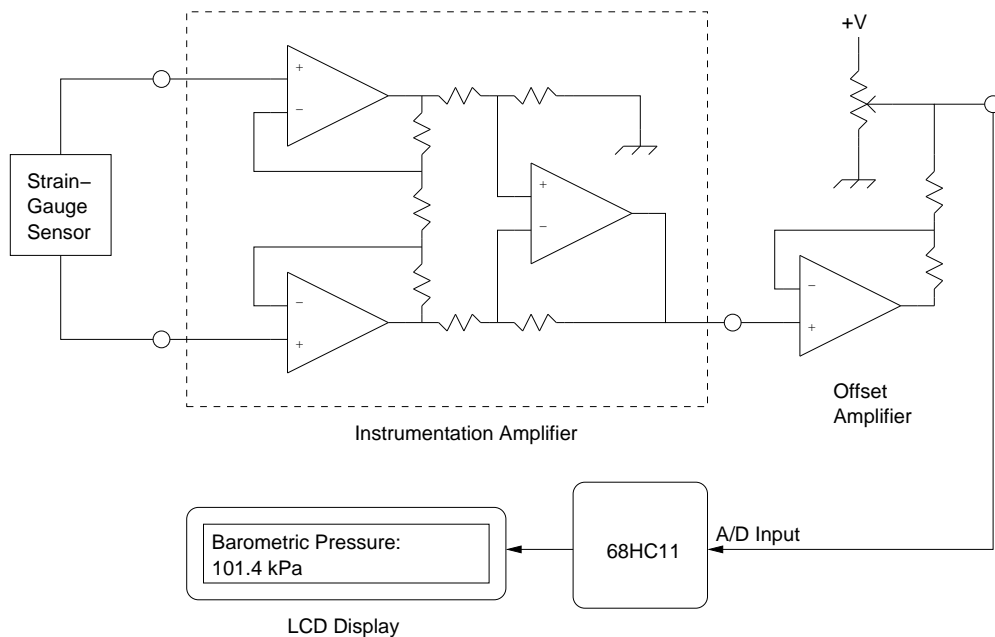
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Electronic Barometric Pressure Sensor

Challenge:

Utilize a microprocessor to determine the ambient air pressure.



Solution:

Analog interface circuit amplifies voltage from strain-gauge pressure sensor for compatibility with microprocessor's A/D converter. Floating-point math package used in software to calculate pressure, used timers and interrupts to update reading; written in assembly.

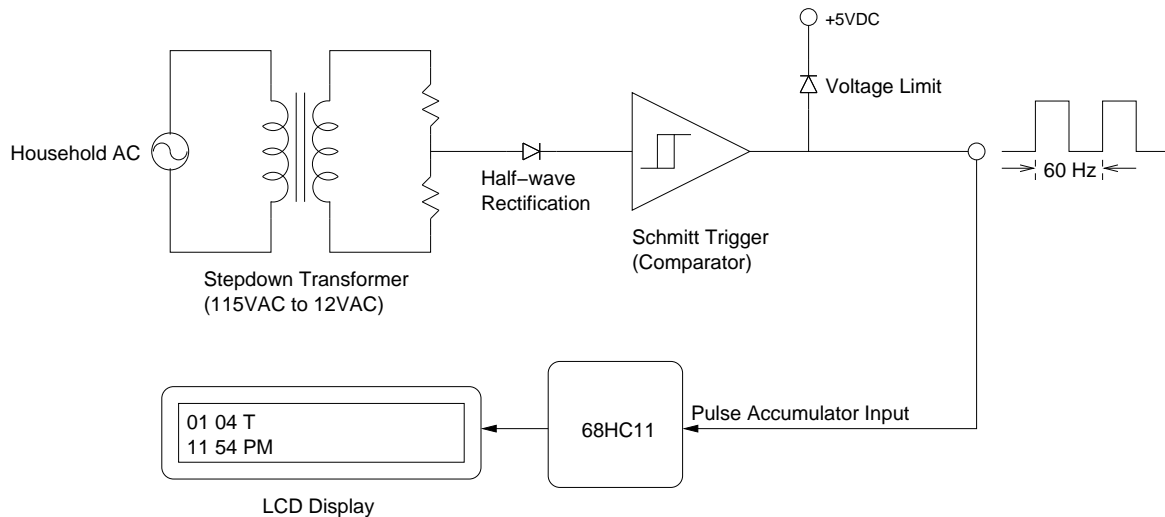
Result:

Reliable and repeatable barometric pressure readings between 87.5 and 112.5 kPa, with 0.1 kPa precision. Off-the-shelf parts keep cost low.

Real-Time Clock

Challenge:

Utilize a microprocessor for an accurate time keeping application.



Solution:

Analog interface circuit converts household AC voltage into low voltage pulse train for microprocessor input. Software keeps time via pulse accumulator and interrupts; written in assembly.

Result:

A multi-purpose digital clock accurate to $\pm 1/60s$, capable of triggering other software events and external hardware events via I/O pins. Off-the-shelf and recycled parts keep cost low.