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Application Note

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The CA1524 pulse-width modulator integrated circuit presently in use in voltage-regulator applications can also be employed as the driving source for an electronic scale. As shown in the block and schematic diagrams of Figures 1 and 2, half of the output of the CA1524, Q2, is used in a lowvoltage (2.2 volts) switching regulator that drives the LEDs displaying the weight measured. The remaining output stage, Q1, is used as a driver for the sampling plates PL1 and PL2. Since the CA1524 contains a 5V internal regulator and is able to operate over a wide voltage range, 8V to 40V, a single 9V battery is sufficient to power the total system. The two sampling plates, PL1 and PL2, are driven by oppositely phased signals (the frequency is held constant but the duty cycle may change) from the pulse-width modulator integrated circuit CA1524. The sensor, S, located between the two plates forms with them an effective divider network of the capacitance bridge type.

As the plate S is moved, the amount of movement depending on the weight of the object on the scale, a change in capacitance occurs. This change is reflected as a voltage to the AC amplifier, the integrated circuit CA3160. At the null position, the signals for PL1 and PL2, as detected at S, are equal in amplitude, but opposite in phase. As S is driven by the scale mechanism down toward PL2, the signal at S becomes greater. The CA3160 AC amplifier provides a buffer fro the small signal change noted at S. The output of the CA3160 is converted to a DC voltage by peak-to-peak detector. A detector of this type is needed because the duty cycle of the sampled waveform is subject to change. The detector signal is filtered further and displayed, by means of the CA3161E and the CA3162E digital readout system, as the weight of the object on the scale.



FIGURE 1. BLOCK DIAGRAM - DIGITAL READOUT SCALE CIRCUIT





FIGURE 2B. CHEMATIC DIAGRAM OF DIGITAL READOUT SCALE

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