DC INPUT

The single rail MC1496 circuit is AC coupled due to the DC biasing voltage on pin 1. Modifying the circuit for use with a DC input requires a method of adding the sensor output to the bias voltage. To do this, an LM324 Quad Op-Amp is employed. The bias voltage is diverted from pin 1, buffered, and then added to the sensor output using a non-inverting summing amplifier. This final output is then input to pin 1.

CARRIER SUPPRESSION

An important variable to take into consideration when working with the MC1496 is carrier suppression versus injection. This determines how much of the carrier wave is present in the output signal. In the frequency domain, the carrier wave component is present at the carrier wave frequency. While under ordinary circumstances of AM modulation this would not be a problem as long as proper filtering were employed, any carrier injection would create an unwanted offset when working with DC or low-frequency signals. As such, maximum carrier suppression must be implemented.

The main control of carrier-wave suppression vs. injection in the MC1496 circuit is the carrier null potentiometer (see Figure 2). Balancing the potentiometer reduces gain but suppresses the carrier. Because carrier suppression is most important, the potentiometer is balanced.

FIGURE 4: A non-inverting summing amplifier.

FIGURE 5: Modulator output when carrier null potentiometer is unbalanced.

FIGURE 6: Modulator output when the carrier null potentiometer is balanced.