MEDIAN VALUE DETECTION TECHNIQUE

Abstract

The median value of a set of voltage values is found by a technique that minimizes the circuitry while maximizing the speed, and also provides for dropouts. The voltage values, illustratively five in number (e.g., V_1 ... V_5), are applied in pairs to the inputs of ten comparators (e.g., 100 ... 109). The outputs of the comparators, and their complements, are formed into five "status words" (e.g., W_1 ... W_5) of four bits each (e.g., C_{12}, C_{13}, C_{14}, C_{15}, ... C_{51}, C_{52}, C_{53}, C_{54}), such that each bit of a given status word represents the comparison of a given value with another of the values. The status word that contains two 1's and two 0's represents the median value. In a preferred circuit embodiment, this status word is rapidly determined in a series of three logic stages, wherein the highest and lowest values are eliminated in the first stage (e.g., Fig. 2), the next highest and lowest are eliminated in the second stage (e.g., Fig. 3), and the last stage (e.g., 400 ... 404) determines the remaining status word that is associated with the median value. This technique also readily provides for dropouts by initializing the logic circuitry. For example, the fifth status word (associated with the fifth value) is preset to 1111, so that if any single value is not received, the missing value is not chosen as the median. Additional dropouts may be similarly treated to ensure that the median is chosen only from the voltage values actually received. This technique may be used, for example, in a disk drive system, where the position of a servo head must be precisely controlled.

This Sheet Has Been Replaced

