

# DATA ACQUISITION AND PROCESSING FOR STRONG-MOTION ARRAY SYSTEMS

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## ABSTRACT

Monitoring earthquakes for engineering purposes in the past has mostly been accomplished with strong-motion accelerographs that are triggered by the events and record on film or magnetic tape. Although it is economical to maintain the equipment this way, it usually takes days (for tapes) or weeks (for films) before the data are available for analysis. In the last few years, it has become possible to access the data more quickly by using "solid-state accelerographs" that permit communications via telephone or cable. With recent advances in seismic data acquisition and processing, it is now possible to implement multi-channel, realtime array systems for monitoring strong motion, caused by earthquakes, in buildings and other structures. This modern approach permits instant access of strong-motion data and provides critical information for decision making. Analysis of complex structural response to earthquakes is greatly simplified with multiple accelerometers and other sensors recorded with a common time base.

The strong-motion array systems implemented by the Central Weather Bureau (CWB) have the following features:

- (1) Each strong-motion array system consists of four components:
  - (i) the transducers, (ii) cables, (iii) a signal conditioning box, (iv) a realtime data acquisition/analysis system.