

## ABSTRACT

Synchronous Machine Testing Using  
Microcomputer-based Instrumentation

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Testing of the three-phase synchronous machine in the UWI laboratory has so far been confined to performance by conventional instrumentation, i.e. voltmeters, ammeters, wattmeters, etc.

In this thesis, a computer-based method is presented using the 6809 microprocessor using the M6809 microprocessor in conjunction with the necessary programming and interface circuits.

A network consisting of a number of potential dividers, resistors and current transformers connect the 3-phase machine's circuit to the input of a 16-channel A/D converter unit. This network sets up voltages at the inputs of the A/D converter channels in relation to the relevant voltages and currents in the 3-phase machine's circuit.

The various readings required during the testing are obtained by program manipulation of the digital outputs of the A/D channels. These are initiated by typing on the keyboard of the system during the exercise.

The computer-based method allows for faster and more accurate readings to be taken. More readings, therefore, can be taken for any of the tests than are usually obtained using conventional instruments.

All readings obtained are obtained in hardcopy form at the end of the laboratory exercise.