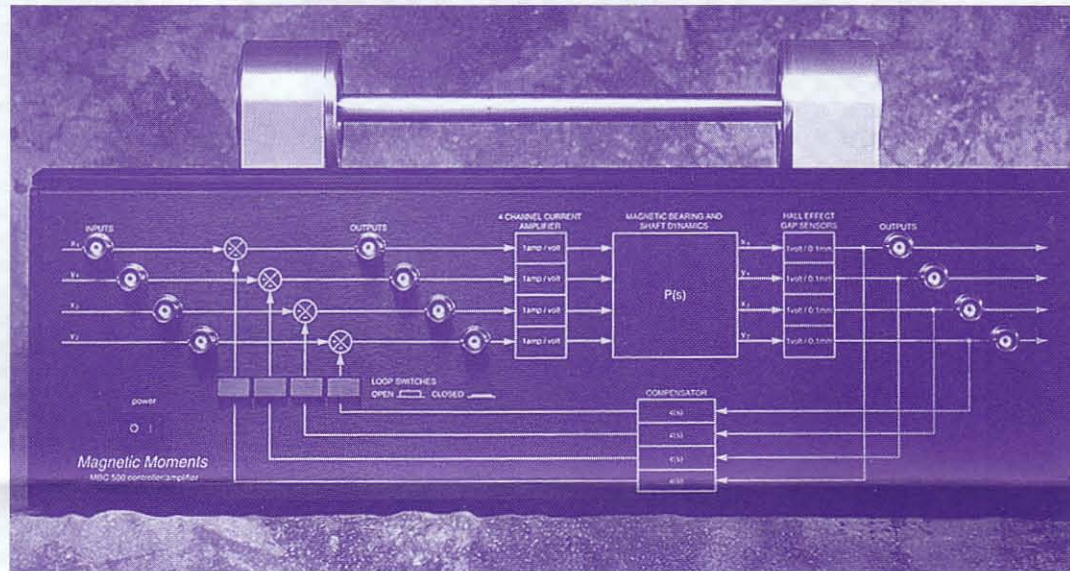


MBC500 Magnetic Bearing Experiment

MBC500 experiments:

- SISO identification
- MIMO identification
- classical control design
- feedback linearization
- nonlinear control synthesis
- multivariable control synthesis
- adaptive control design



THE MBC500 consists of two active radial magnetic bearings and a supported shaft mounted on top of an attractive anodized aluminum case. The shaft is actively positioned in the radial directions at the shaft ends (4 degrees of freedom), it is passively centered in the axial direction, and it freely rotates about its axis. Included in the system are four linear current amplifier pairs, one pair for each radial bearing axis, and four internal lead-lag compensators which independently control the radial bearing axes.

THE front panel is a graphical representation of the system dynamics with 12 BNC connections for easy access to system inputs and outputs. Four front panel switches allow the user to open the loop for the internal axis controllers independently. By switching off only a single loop the user can perform simple single-input single-output control design experiments. With all internal loops open a sophisticated 4 by 4 external controller can be implemented. The control bandwidth is roughly 2kHz so external controllers are typically DSP-based or analog.

With the Turbo 500 option, or the High-Speed Rotor Dynamics option, additional turbine speed control and rotor dynamics experiments are possible. The MBC500 is provided with a detailed users manual which includes:

- laboratory experiments and operating instructions
- control/amplifier schematics
- transfer functions of lead-lag compensators and current amplifiers
- nominal sensor curves
- nominal bearing current/force/displacement characteristics
- shaft characteristics (Young's modulus, density, length, diameter)

Power requirements: 110/220vac (60/50Hz)