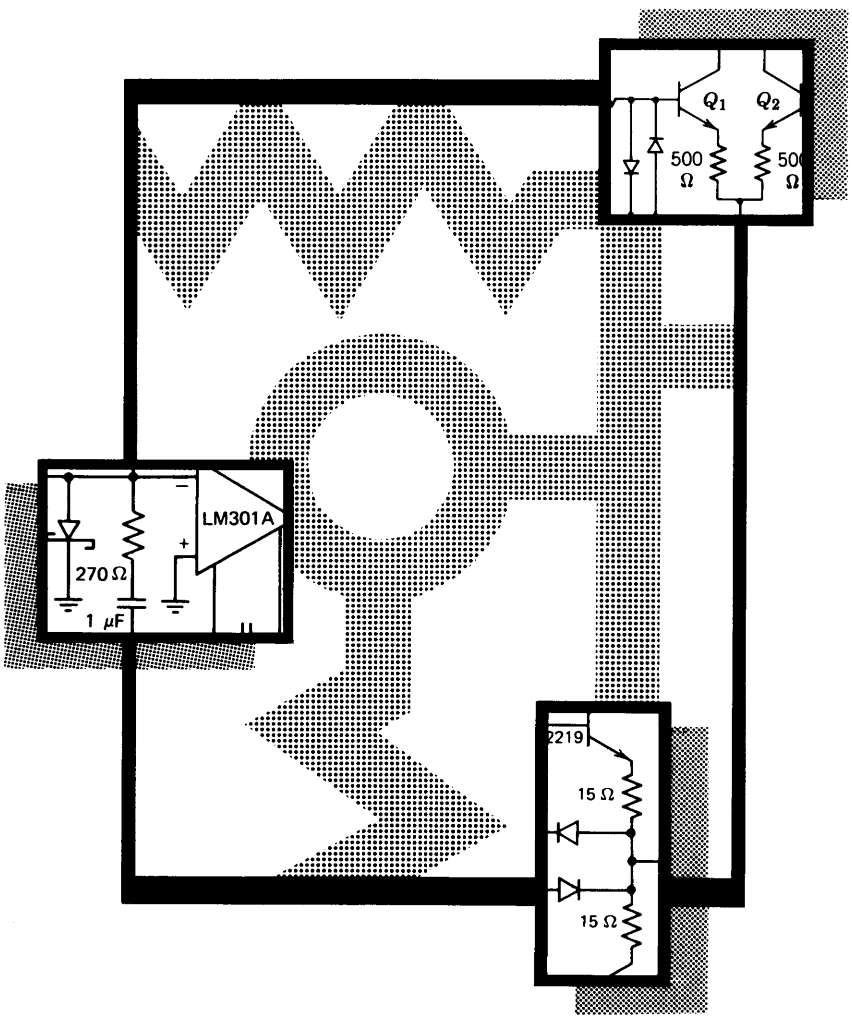
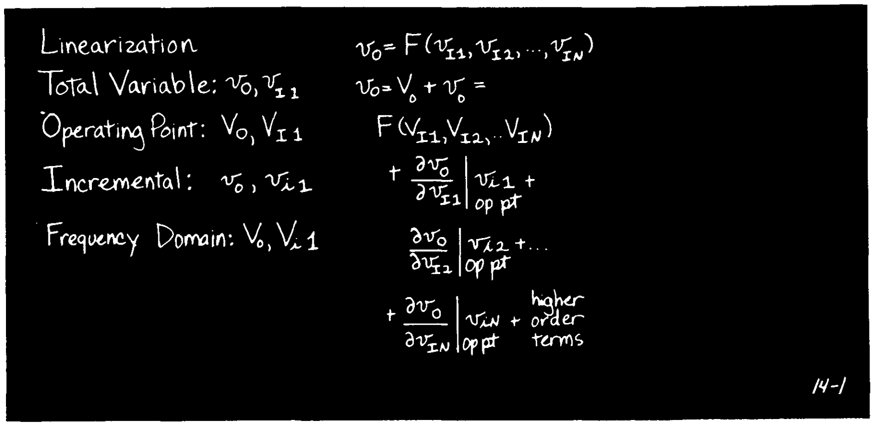
VIDEO COURSE MANUAL

Linearized Analysis of Nonlinear Systems

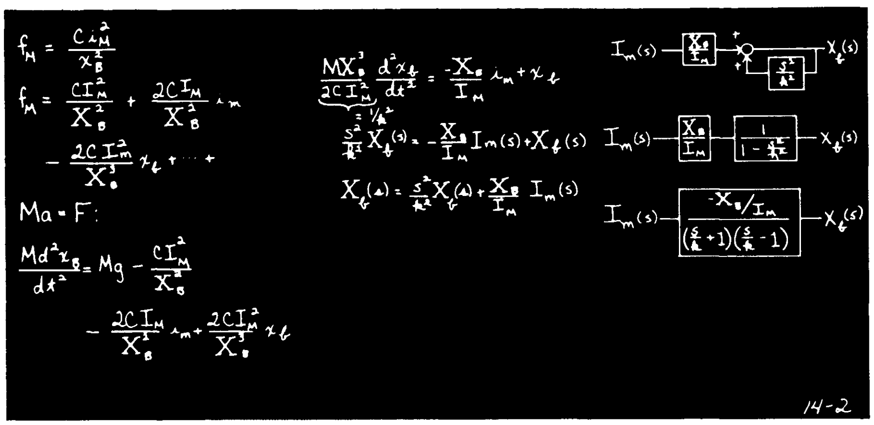
14



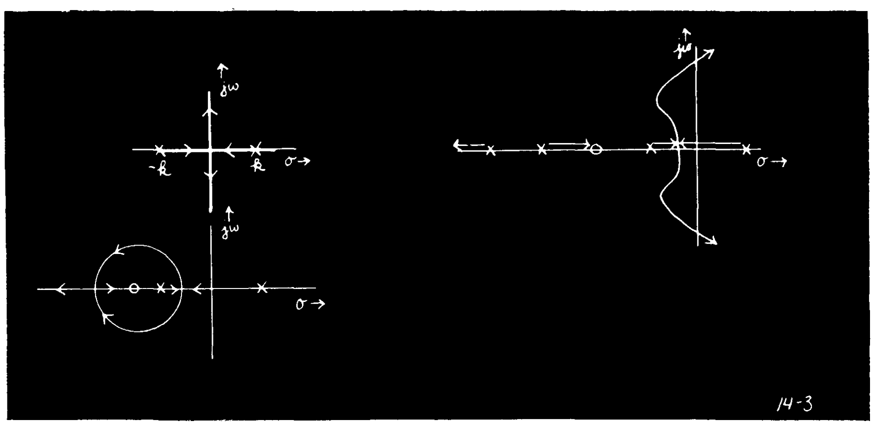
Blackboard 14.1

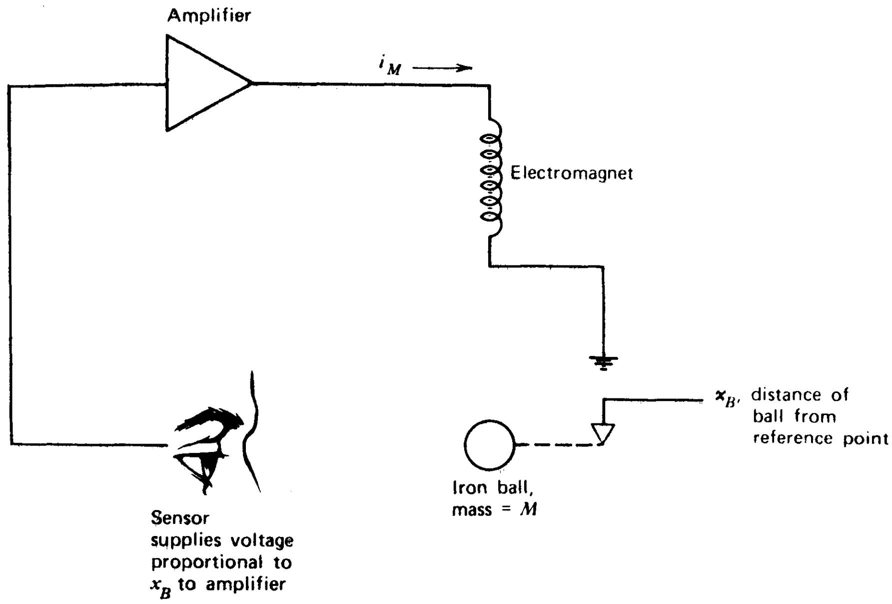


Blackboard 14.2

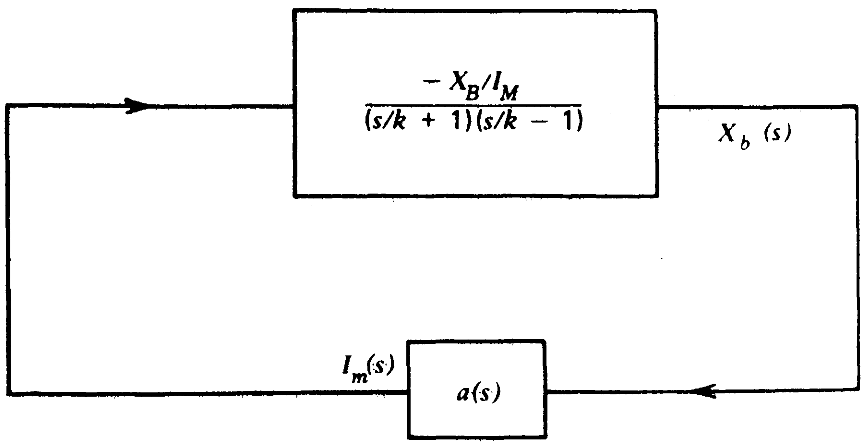


Blackboard 14.3



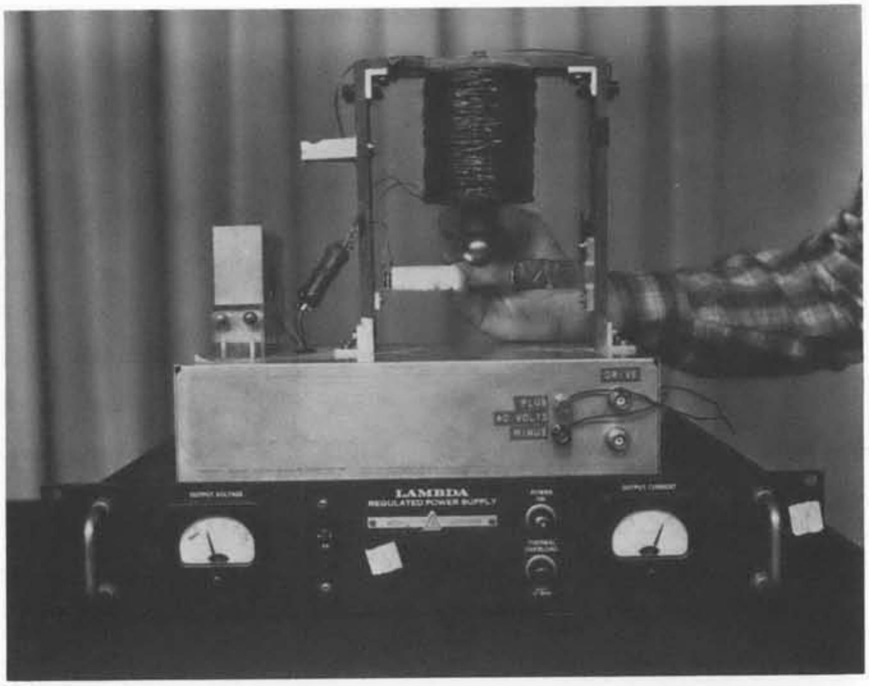


Viewgraph 14.1

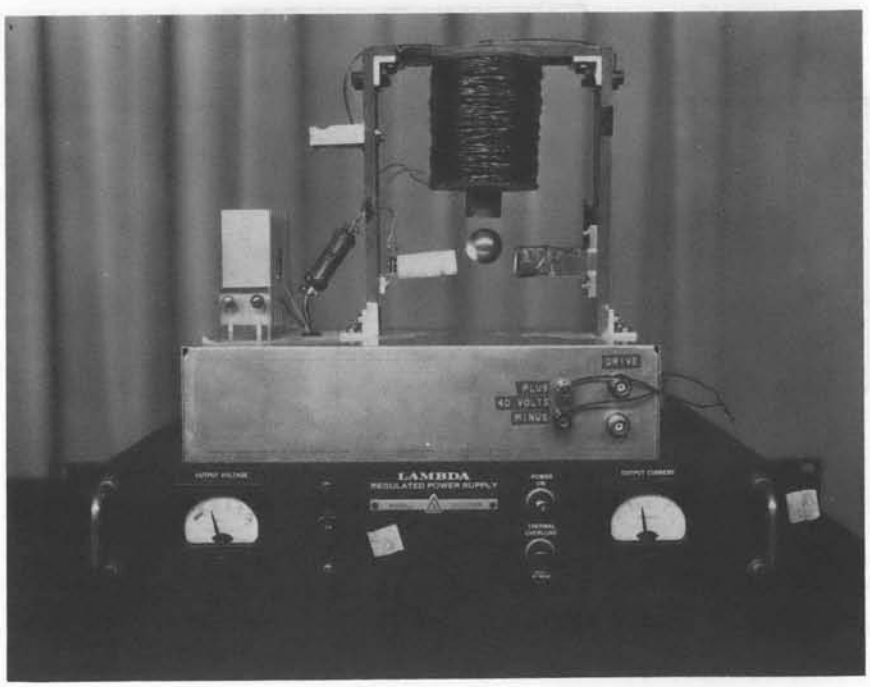


Viewgraph 14.2

Demonstration Photograph
14.1 Trying to get the magnetic-suspension system started



Demonstration Photograph
14.2 The magnetic-suspension system in operation



Comments

The analytical techniques introduced up to this point in the course make liberal use of superposition. Unfortunately, superposition does not generally apply in nonlinear systems, and consequently we need to develop new methods of analysis for systems where nonlinearity influences performance.

One possible method is to linearize the system equations about an operating point, recognizing that the linearized equations can be used to predict behavior over an appropriately restricted region around the operating point. This technique is used to determine compensation for a magnetic suspension system. The linearized equations of motion of this system have a loop-transmission pole in the right-half plane, reflecting the inherent instability that exists when the magnetic field strength is fixed.

Reading

Textbook: Chapter 6 through Section 6.2.

Problems

Problem 14.1 (P6.1)

Problem 14.2 (P6.2)

Problem 14.3 (P6.3)

RES.6-010 Electronic Feedback Systems
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