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Memorandum M-1061

MASSACHUSETTS INSTITUTE OF TECHNOLOGY
DEPARTMENT OF ELECTRICAL ENGINEERING

Report No. 5

Prepared by: W. N. Papian

PROGRESS REPORT TO THE DEPARTMENT COMMITTEE ON GRADUATE STUDY AND RESEARCH

SUBJECT OF RESEARCH: M. S. Thesis: A Co-Incident Current Magnetic Memory Unit

Period Covered by this Report: May 19 to July 5, 1950

Student Working on Research:

W. N. Papian

Building: Barta

Noted by:
Res. Lab. Office _____
Grad. Comm. _____
Supervisor _____

Expected Date of Completion:

July 21, 1950

Supervisor: J. W. Forrester

Detail of Work Currently Active: The thesis chapter covering core response times is being written.

Expected Date of Completion of this Detail: July 17, 1950.

Statement of Progress Since Last Report:

There are no new significant experimental results to report.

A field trip was made to two firms which are manufacturing and developing magnetic ferrites. The purpose of this trip was to find out whether much was known about producing ferritic cores with good rectangular shaped B-H characteristics, and whether outside companies could be induced to do some work in that direction. The answers to both questions seem to be largely negative, so that it becomes worth considering the possibilities of launching such a development program here.

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A dozen sample metallic cores were received from a steel company. These are essentially smaller versions of the promising core MTS 4382; rough tests indicate that they can be switched in about 20 μs, and have fine information-retention ratios. Plans were begun to incorporate 4 of these into a two-dimensional storage array which can be expanded later to a three-dimensional, 8-core, array, to be used for demonstration and as an introduction to the problems involved in a working assembly.

The draft of the introductory chapter of the thesis has been written, and a start made on the chapter on response times. Calculations were made and curves drawn to show the growth of flux in the cross section of a thin ribbon of magnetic material for the linear case (μ constant). A rough approximate method was developed for adapting these curves to the special non-linear case where the material saturates completely above some flux value. Curves of flux versus time and their first derivatives were then plotted for that case. The curves of $d\phi/dt$ have a fair qualitative resemblance to the shapes of the pulses obtained experimentally.

WNP:kms

Signed: William N. Papian
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