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Memorandum M-1028

MASSACHUSETTS INSTITUTE OF TECHNOLOGY
DEPARTMENT OF ELECTRICAL ENGINEERING

Report No. 3

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: April 1, 1950 to April 24, 1950

Student Working on Research:

W. N. Papian

Room Number: Barta Building

Expected Date of Completion:

July 21, 1950

Supervisor: J. W. Forrester

Noted by:
Res. Lab. Office_____
Grad. Comm. _____
Supervisor_____

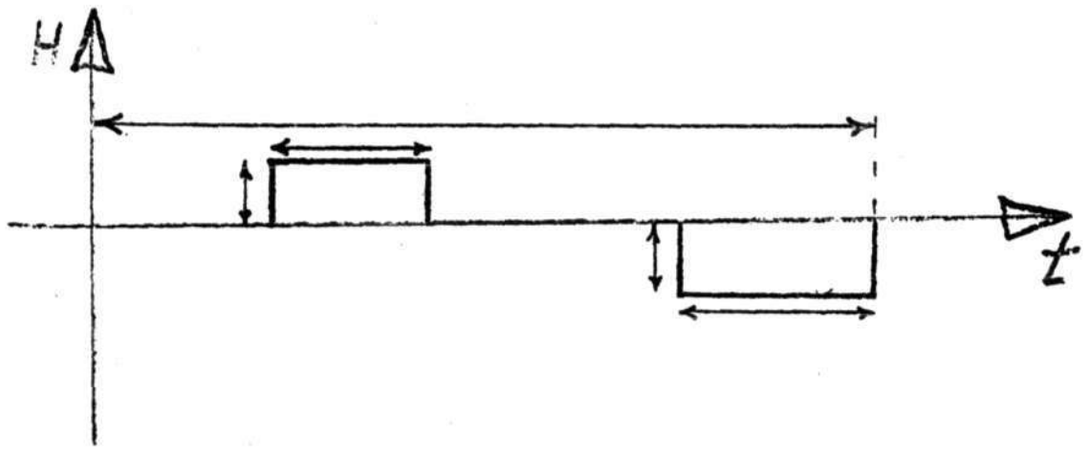
Detail of Work Currently Active: Tests on suitable cores are being run to collect data on stability of stored information and response-times of single units of this type of magnetic memory.

Expected Date of Completion of this Detail: May 8, 1950

Statement of Progress Since Last Report: Include references, with statements of their usefulness.

Response-time tests were made on four cores. Three of these were standard Deltamax tape-wound cores differing only in tape thicknesses, which were 0.0005, 0.001, and 0.002 inches. Results here show shorter times for thinner tapes. The ratios of these response-times (for set values of H) for the 2-to-1 thicknesses vary from 1.4 (for high values of H) to slightly over 2 (for values of H=3 H_c). From the shapes of the curves of the plotted data, it appears as though these ratios continue to increase as H approaches H_c; they might possibly approach 4, the square of the thickness ratios. The fourth core was a Deltamax core with a highly modified B-H characteristic; the plotted data for it had the same shape as the other curves.

The test setup can now subject a core to cyclic magnetizing forces as indicated in the accompanying figure.



Parameters indicated by arrows in the figure may be varied independently over a wide range, and the results may be observed on a synchroscope.

Attempts to see how well the test setup could check for stability of stored information and for response-times turned up some results on one core (MTS 4382) which were very promising for future progress in this work. A high order of stability was accompanied by a 40-μs response-time in this relatively large core. There is reason to believe that this stability can be maintained and response-times cut to less than half of the above by reduction of core-tape thickness and increase in coercive force (H_c) of the core and material. Correspondence in this direction was initiated with the suppliers of the test core.

Signed: William N. Papian
W. N. Papian

WNP:sst