

Memorandum M-2254

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Digital Computer Laboratory
Massachusetts Institute of Technology
Cambridge, Massachusetts

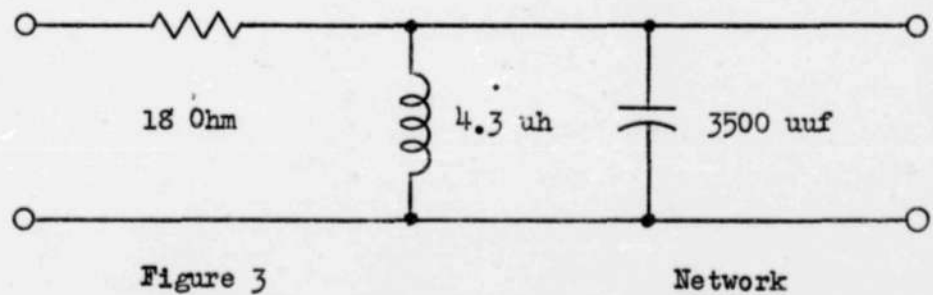
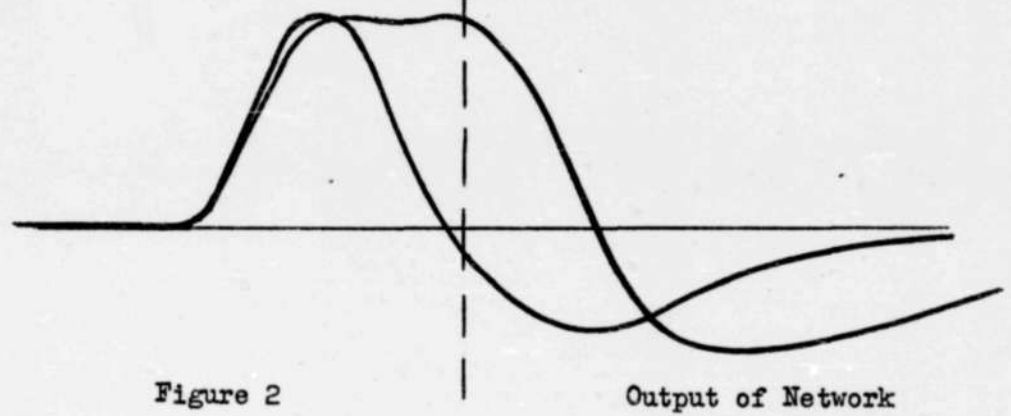
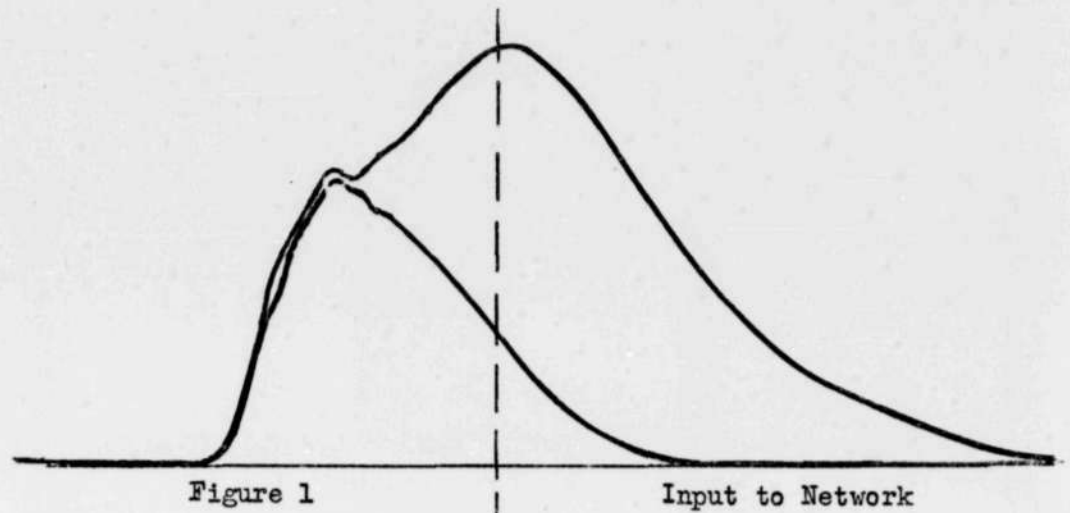
SUBJECT: SENSING THE SLOPE OF MAGNETIC MEMORY OUTPUT
To: William N. Papiian
From: Kenneth H. Olsen
Date: June 19, 1953

Abstract: In the MTC memory, the amplitude of the output voltage is sensed to tell if it is a "one" or a "zero". If the slope of the output is sensed, the "one" to "zero" ratio may be greater.

In M. T. C. the amplitude of the output voltage of the coincident-current magnetic memory is sampled at a fixed time. Pulses above a fixed level are considered "ones" and those below are considered "zeros". Sensing may be more straight forward if, instead of the amplitudes, the slopes of the output pulses are sampled because at a fixed time the slope of a "zero" is negative while that of a "one" is positive.

A voltage proportional to the slope can be obtained by differentiating the output of the memory but this attenuates the amplitude of the signal significantly and accentuates the noise. If this signal is only "partly differentiated", the difference in slope may still be discernible without a great loss in amplitude. If a capacitor is put across the "differentiator", it will filter out some of the noise and may help the circuit recover quickly.

Figure 1 shows the output signals from a memory core in an experimental set-up. The "zeros" are made unusually large to exaggerate the effect of noise. When the signal is put through the network of Figure 3, the output is as shown in Figure 2.



Sensing Amplifier "Differentiator"

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It can be seen that even with this large "zero" there is a time when the "one" is positive and the "zero" is negative. With smaller "zeros" there is a much greater time when this difference is evident.

Signed Kenneth H. Olsen
(Kenneth H. Olsen)

KHO:hpm