

IN REPLY
REFER TOWAR DEPARTMENT
OFFICE OF THE CHIEF SIGNAL OFFICER
WASHINGTON

8

March 15, 1937

Mr. W. D. Hershberger,
4113 Walnut Street,
Philadelphia, Pennsylvania.

Dear Hershberger:

Mr. Friedman and I have been working on a means of securing secrecy, primarily in voice communication, and, having arrived at a point where we very much wish to know whether or not there are any "bugs" in the idea which would prevent its satisfactory operation, would very much appreciate it if you would give us the benefit of your experience at the Laboratories in connection with your studies on magnetic recordings on steel tapes.

Briefly, the idea is this: To eliminate the expense of filter systems and/or complex synchronizing devices, we struck upon the idea of mixing the audio frequencies occurring during a small unit of time with the audio frequencies which occur during two or three succeeding units of time. To secure the time-delay necessary for this, we propose to record magnetically the audio frequencies on a moving steel tape, the movement of which through a short distance would give us a delay of the order of $1/50$ second.

Our first question is this: If two or more audio frequencies are successively impressed on a steel tape, will the resultant be the algebraic sum of the individual ordinates at each point?

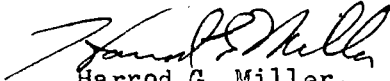
Our second question is: Would the fidelity of the impression and pick-up from the steel tapes be such that the components of the original impressing currents could be sorted out according to the time (that is, distance along the tape) they occur, and fed back to cancel themselves out of the succeeding units which they are garbling?

I am enclosing two photostats, the one with the moveable steps representing what occurs in the transmitting station (at the top) and the receiving station (at the bottom). In the figure in the top the group of frequencies which occur in the first unit of time is represented by A; the group of frequencies which occur during the second interval of time, by B; those during the third interval of time, by C; etc.

I hope that the rest of the prints are self-explanatory.

As I said above, Mr. Friedman and I will very much appreciate any thoughts you may have on the theoretical feasibility of this scheme.

Very truly yours,


Harrod G. Miller,
Captain, Signal Corps.

Encl. - 2 photostats

1st Memo Ind.

8

OCSigO, WP&T Div., June 30, 1936 - To: Research and Development Division.

Forwarded.

W. S. Rumbough,
Major, Signal Corps.

Encls. (no change)