

WAR DEPARTMENT

## SIGNAL CORPS LABORATORIES

IN REPLY REFER TO

FORT MONMOUTH

GAG:D

EXPRESS AND FREIGHT ADDRESS  
LITTLE SILVER, NEW JERSEYPOST OFFICE ADDRESS  
OCEANPORT, NEW JERSEY

March 11, 1933.

Mr. William F. Friedman,  
Cipher Section,  
Office of the Chief Signal Officer,  
War Department,  
Washington, D. C.

My dear Friedman:

With reference to your letter of February 24, 1933 the circuit as proposed by you for adding an additional tape transmitter to the cipher machine has been checked and will undoubtedly work correctly as intended. The photostat copy of your sketch is being retained for future reference.

With regard to sending you an additional tape transmitter, you are advised that there are at present only two such tape transmitters as modified for application to the cipher machine. You have one of these transmitters and the other one is installed on the cipher machine held at these Laboratories. It is not desired to release the one with the laboratory model cipher machine but it is considered preferable to modify an additional standard 110 volt tape transmitter. In order that you may clearly visualize the work required in this modification the tape step-forward magnets of the standard tape transmitter were rewound for operation on 8 volts. In addition to this you will recall that the standard tape transmitter presents all contacts in common for both spacing and marking. It was therefore necessary to provide individual insulated front and rear contacts in these transmitters and to wire those contacts to wedge terminals as in your model. It is estimated that the work required in this connection from a shop standpoint would require approximately one weeks time. The shop at the present time is very busily engaged in certain radio work of a high priority as directed by the Chief Signal Officer. In order to disrupt such priority it would be necessary that you take the matter up with the Engineering & Research Division of your office.

In any event, you should present the desire for an additional transmitter to the Engineering & Research Division in order that these Laboratories may be officially authorized to proceed with the work of the modification of the additional tape transmitter for the cipher machine. Such an

Le. to Mr. William F. Friedman

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authorization will then permit the modification of the transmitter when circumstances permit.

Referring again to the circuit modification, while as stated before there is no doubt about the circuit working electrically, but from the standpoint of cryptographic possibilities it seems to me that you are in degree reducing the secrecy. In the final analysis the secrecy of our machine depends upon the commutations of the cipher wheel. Aside from all other elements, that is, the position of the wheel actually determine the cipher letter. It would seem then that in reducing the resultant average number of positions or steps would in turn increase the frequency of appearance of any given cipher character. However this is a matter for you to determine.

It would seem from the standpoint of distribution of tapes or machine setting to a given receiving station or net that the matter could be very satisfactorily arranged if we would provide the additional five manually operated drums by means of which an arbitrary sequence could be set up for each and every message transmitted, holding the tape proper constant. The sequence of this drum arrangement could be noted on the bottom of each message transmitted, as for example a,y,t,x,g, etc.

In summation of the above it is recommended that you contact representatives of the Engineering & Research Division and request that a directive be given these Laboratories for the modification of an additional tape transmitter for your experimental use in conjunction with the Converter, type TM-136-T1.

Very truly yours,

  
GEORGE A. GRAHAM

GAG:D

Date \_\_\_\_\_

Received from the Signal Corps Laboratories letter dated February 27, 1933, subject, "Description and Operating Instructions for Converter, type M-134-T1", file Project 86.

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(Name)

W.F.Z.

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(Rank)  
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