W.P. & T. Div.

WAR DEPARTMENT
OFFICE OF THE CHIEF SIGNAL OFFICER
WASHINGTON

alp

March 1, 1933

MEMORANDUM TO: Research & Development Division.

In accordance with the suggestion made in a conference with Lieut. Elder, there is attached hereto a draft of "Military Characteristics of a cipher machine for use in message centers of division and higher headquarters. Your comments are requested.

S. B. Akin,
Major, Signal Corps.

Attached:
Draft (dupl.)

WAR PLANS AND TRAINING DIVISION

DATE 4/25/33

TO: _____

Ex. O.	Lt. Rhoads
Fiscal Sec.	Lt. Corderman
Met'l Div.	Mr. Friedman
Pers. Div.	Mr. Rowlett
Photo. Div.	Mr. Sinkov
P. & T. Div.	Mr. Kullbach
R. & D. Div.	Mr. Hurt
Sup. Div.	Miss Cloyes
W.D. Msg. Cen.	Miss Newkirk
Maj. Akin	Miss Pearson
Capt. Moran	Miss Janssen
Capt. Baldwin	Mr. Clark
✓ Capt. Borden.	

FOR:
✓ Comment
Recommendation
Concurrence or recommendation
Notation & File in (Your Div. / Gen. Files / W.P. & T.Div.
Notation and return
Notation and mail
Notation and
transmission to Ex. O.
Preparation of draft of reply
for signature by _____
Signal Corps Bulletin
Your action
Your information
Approval.

FROM: Major Akin
Captain Moran
Captain Baldwin
Captain Borden ✓
Mr. Friedman ✓

REMARKS:
This seems to be o/k
FOB

MILITARY CHARACTERISTICS OF CIPHER MACHINE FOR USE IN MESSAGE CENTERS OF DIVISION AND HIGHER HEADQUARTERS

a. This machine should be designed for the fundamental purpose of enciphering and deciphering messages with speed, accuracy, and great security.

b. It should consist of two units, (1) a cryptographic unit provided with a 26-element keyboard, and (2) a printer unit suitable for making a permanent record, preferably a page printer. The cryptographic unit is the part in which the enciphering or deciphering operations take place; the printer unit is associated with the cryptographic unit and merely prints the cipher text, in case of encipherment, or the plain text, in case of decipherment. The cryptographic unit should be so constructed that in case of printer failure cryptographic operation may be continued by means of electric light-bulb indicators on a lamp board.

c. The weight of the cryptographic unit including its carrying case, should not exceed 25 pounds; that of the printer unit, including its carrying case, 35 pounds. Both units should be fairly rugged in construction, capable of withstanding the jarring incident to vehicular transportation when a Headquarters moves to a new location.

d. The apparatus should be designed to operate on 8-volt storage battery supply at temporary and semi-temporary headquarters; on 60 cycles, 110 volts, A.C. power supply at permanent headquarters and offices.

e. The cryptographic operations should be controlled by an external element which is variable and is not an intrinsic part of the mechanism itself, such as a perforated tape similar to that employed in printing telegraph apparatus. The underlying cryptographic principle should be that of a continuous, nonrepeating, unintelligible or random-mixed key sequence of characters governing the encipherment of successive letters.

f. The minimum speed of operation in enciphering and printing a message should be approximately 60 characters per minute; the optimum speed would be that to be expected of a competent typist, approximately 200 - 250 characters per minute.

g. In its ultimate form the whole apparatus should be capable of being associated directly with a transmitter for wire or radio communication, so that operation of a local cryptographic keyboard will cause signals to be transmitted which will actuate a distant printer upon which the cipher message may be typed in its cryptographed form, or, if practicable, directly into its plain-text form, passing automatically through the intermediate stage of decryptographing on the cryptographic unit.