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Memorandum M-1106

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Electronic Computer Division  
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Massachusetts Institute of Technology  
Cambridge, Massachusetts

CLASSIFICATION CHANGED TO:  
Auth: DD 254  
By: R. E. EVETT  
Date: 12/2/59

SUBJECT: BI-WEEKLY REPORT, Project 6782, September 29, 1950.

To: J. W. Forrester

1. GENERAL

(R. A. Nelson)

As part of the planning for our project I wrote a memorandum to Mr. Forrester on our status at the end of three months of work and the likely direction to be taken in the next three months. Generally speaking, initial orientation has now been completed for Dodd, Katz, and myself, and a start has been made in coding the Mk 47 system. This will be finished and then investigated for ways to make it fit in best with digital techniques, which will involve studies of table look-up vs function generation, prediction methods, and smoothing. This work will be chiefly Dodd's responsibility. Katz will start very shortly to consider problems of the response of guns as servo systems to orders furnished discontinuously. The division of effort mentioned in the Bi-Weekly Report of July 21 (M-1069) still seems appropriate.

In addition to miscellaneous reports, I have read certain parts of interest of the original Mk 65 report.

(A. Katz)

The past two weeks have been spent in orientation with respect to the fire-control problem. I have been reading the manual on naval ordnance and practicing coding.

2. THE FIRE CONTROL PROBLEM

2.3 Coordinate Transformation

(R. A. Nelson)

Mk 47 uses an approximate expression for horizontal parallax correction that goes to infinity for an ordered gun elevation of 90°, although the system is supposed to be able to handle this case. I have derived the exact expression for this which reduces to a meaningful correction for overhead targets. Deck tilt does not complicate the correction if the orders to be corrected have already been transformed to deck coordinates.

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3. CODING

(J. M. Dodd)

No further coding has been completed during this period. The Linear Rates Section will probably be the next section to be finished, but at present it waits upon the final formulation of the code for exponential smoothing (the kind of smoothing used by the Mk 47 Computer).

Some difficulty has been experienced in trying to code the expressions for gun parallax correction, because at least one of the equations used by Mk 47 blows up under certain circumstances. It is our intention, however, to attempt first to code the approximation and then later to try to obtain an exact expression which will be valid at all times.

cc: R. R. Everett  
H. Fahnestock  
W. G. Welchman  
C. R. Wieser

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