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FROM: Judy Spall

SUBJECT: Use of the Cal Comp Plotter and the IBM 1401

The MIT Computation Center has on order a California Computer Products Plotter, Model 555, which is connected to the IBM 1401 through the IBM 1407. The plotter is selected through a 1401 program which must convert data to plotter-actuating signals. The plotter will accept the commands: pen up, pen down, move paper forward, move paper reverse, move pen left and move pen right. The pen up or pen down commands may be given at a rate of 10/second. The move paper and move pen commands may be superimposed on one another with the result of a 45° trace. These two commands may be given at a maximum speed of 300/second where each command causes a step of .01 inches.

Programming the 1401

The IBM 1407 will be selected by giving the instruction

$\frac{L}{M}$ o/c TO BBB d

where the operation code is L or M depending on whether one is reading, plotting or typing from core storage with or without word marks, respectively.

BBB is the starting location in storage from which data is typed, plotted or into which it is read.

d is R, W, S meaning read into storage from typewriter, type from storage starting at BBB, plot from storage starting at BBB, respectively. The R and W modifiers would operate as on the basic 1407 and the S modifier would cause the plotter to operate on each digit in the BBB address until a group mark/word mark was sensed.

The digits 0-9 are converted to plotter commands as follows:

- 0 = Pen down
- 1 = Move + pen
- 2 = Move + pen and + paper
- 3 = Move + paper
- 4 = Move - pen and + paper
- 5 = Move - pen
- 6 = Move - pen and - paper
- 7 = Move - paper
- 8 = Move + pen and - paper
- 9 = Pen up

Control is returned to the 1401 when the digit prior to the group mark/word mark is recognized. Therefore, one may arrange to compute each successive point while a prior point is being plotted. Since the plot rate is 200 steps per second one has 400 character cycles to compute the next point.

