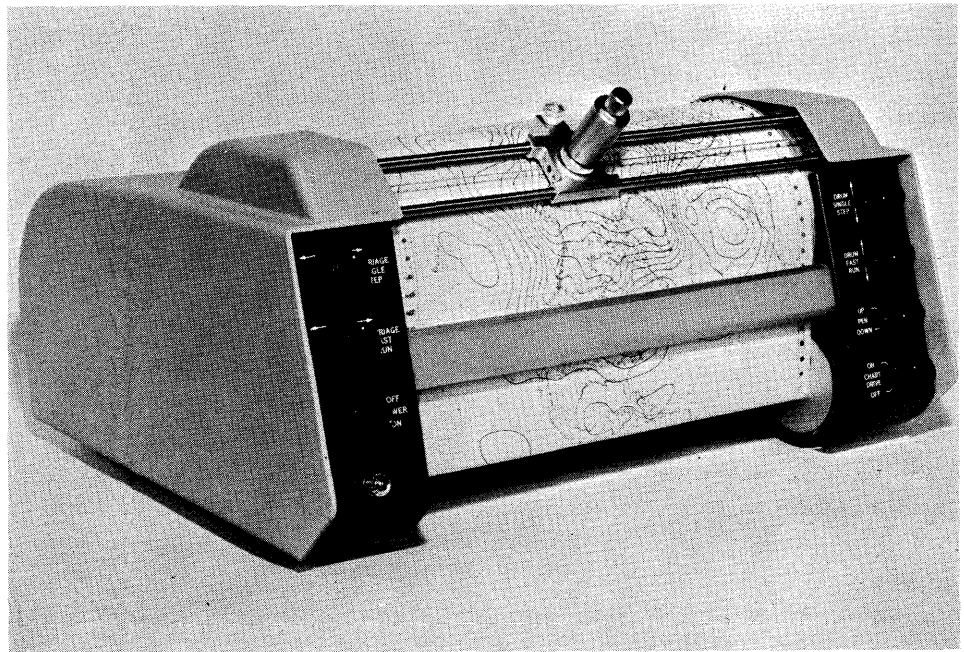


## X-Y PLOTTER

### GENERAL DESCRIPTION

The X-Y Plotter plots, under program control, discrete points, continuous lines, curves, letters, numerals, and symbols. The information to be plotted is received via the Universal Buffer-Controller (UBC) from the Philco 2000 or any input device connected to the UBC. One or two X-Y Plotters may be coupled to any channel of the UBC for concurrent operation.



### PLOTTER CHARACTERISTICS

Continuous lines in both the vertical (Y-axis) and the horizontal (X-axis) planes can be plotted by the Plotter. Plotting along the X-axis is done by moving sprocketed, continuous feed paper on a bi-directional rotating drum. Y-axis plotting is performed by moving a pen across the plotting paper. Diagonal lines are drawn by combinations of X and Y movements; discrete points are made by raising, moving, and then lowering the pen.

## Speed

Plotting is performed at a rate of 300 horizontal or vertical pen movements per second. Movements are made at a density of 100 per inch for a rate of three inches per second. Pen movements for discrete points, up or down, are performed at a rate of 10 per second.

Characters with a one in the filler field are not plotted and are transferred into the Plotter at a speed of approximately 20,000 characters per second.

## Range of Movement

Combinations of pen and paper movements provide for horizontal, vertical, and diagonal plots on a plotting area 11 inches wide.

The Plotter always steps 1/100 inch in either the X or Y direction.

Points on a 45° plane are made by the plotter in a single step of .01414 inches. A plotted diagonal other than 45° must be made up of a series of pen carriage and paper drum movements.

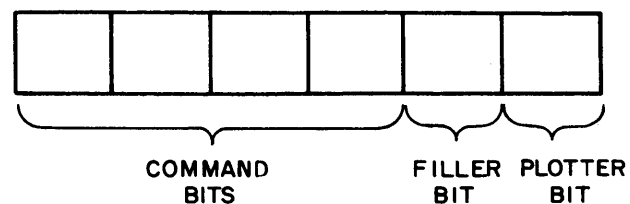
## Simultaneous Operations

One or two Plotters may be connected through a Plotter Controller to one UBC channel for concurrent operation. Since each character sent to the Plotter system specifies the Plotter to be used as well as the plotting movement, data for all Plotters on a channel of the UBC may be intermixed.

## PROGRAM CHARACTERISTICS

Single character (6-bit) codes designate the pen or paper movement to be performed and which one of the two Plotters connected to a UBC channel is to perform the designated action. The first four bits of each character, the command bits, designate the movement; the filler bit specifies a filler or non-filler character; and the plotter bit designates which of the two Plotters is to be used.

### CHARACTER FORMAT:



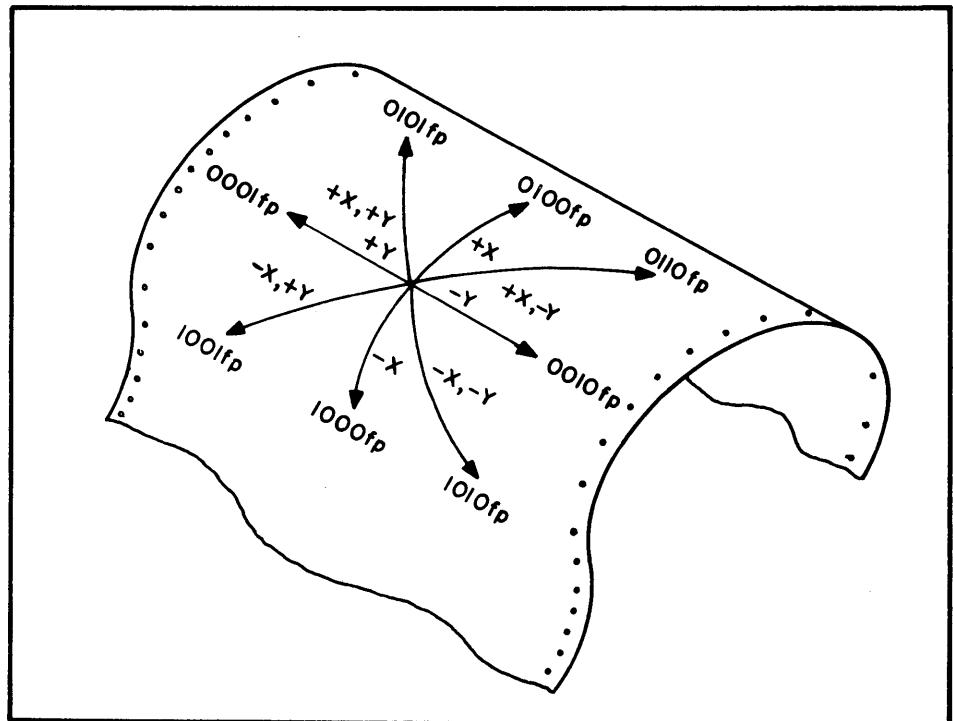
Plotter characters are transferred into the UBC from the computer or an input-output device in groups of one block (128 words or 1024 characters). The first word of each block contains data select information for the UBC (refer to section UBC of the Philco 2000 Input-Output Manual, TM-16). This word is transferred from the UBC to the Plotter only when write-all mode is employed.

The following 6-bit configurations are used with the Plotter:

0000fp Pen Up	0100fp +X
0001fp +Y	1000fp -X
0010fp -Y	1001fp -X,+Y
0101fp +X,+Y	1010fp -X,-Y
0110fp +X,-Y	1111fp Pen Down

where:

- Y indicates a movement toward the right margin
- +Y indicates a movement toward the left margin
- +X indicates a movement toward the top of the paper
- X indicates a movement toward the bottom of the paper
- f indicates a filler character (0 = non-filler, 1 = filler)
- p indicates the specified Plotter (0 = first Plotter, 1 = second Plotter)



The vectors indicate pen motion relative to the last point on or above the paper.

If the pen is on the right or left margin and a code is issued which would move the pen beyond the margin, that movement is not made. However, any component of the code along the paper is executed.

Any code not defined, or a pen up or pen down code issued when the pen is already up or down results in no pen movement.

## CHECKING FEATURES

Any codes other than those listed on page 3 are considered invalid. Every character should enter the X-Y Plotter Controller with odd parity; any even parity is an error. Invalid codes or parity errors set the parity error indicator; however, neither of these errors terminates transmission at that time. At the end of a block, a parity error indication is transferred to the UBC.

## PLOTTING ACCESSORIES

Special chart paper, in green, orange, or black translucent, and interchangeable plotting pens, in black, blue, red, and green, are available.