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January 8, 1965

1620 XY PLOT PROGRAM

by

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Modifications or revisions to this program, as they occur, will be announced in the appropriate Catalog of Programs for IBM Data Processing Systems. When such an announcement occurs, users should order a complete new program from the Program Information Department.

DECK KEY

1. FORTRAN source deck -
   1620 XY Plot Program
   Sequence # in cc. 73-80 (MASLP001-MASLP060)
   60 cards.

2. Object deck -
   1620 XY Plot Program
   Sequence # in cc. 75-80 ($\overline{0}$00001-$\overline{0}$00236)
   236 cards.

3. Sample Problem Input
   9 cards.

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PROGRAM BRIEF

A. Purpose

This program will plot data in the first quadrant of the X-Y plane, using a 1443 Printer. Input parameters include:

a) title of plot
b) date of plot
c) title of Y-axis
d) title of X-axis
e) upper limit of the Y-axis
f) scale of the intervals on the Y-axis
g) number of printed lines between indicative information on the Y-axis
h) the character used to plot the data

B. Method

The program begins printing at the upper limit of the plot and decrements at regular intervals until it reaches the abscissa (X axis). Printing takes place from an output array, the elements of which have either blanks or the plot character.

C. Restrictions

The abscissa (X axis) is limited to 113 points.

The input points to be plotted must be Y-coordinate values, arranged on the data cards in increasing order of X starting from the origin.

The indicative information on the Y-axis is limited to six digits.

D. Accuracy

Not applicable.

E. Machine Configuration

A 40K 1620 system with:

a) 1622
b) Indirect Addressing; Automatic Divide
c) 1443 Model 1 (121 print positions)

F. Program Requirements

This program occupies 17,610 core positions.

G. Source Language

This program is written in 1620 FORTRAN II.

H. Program Execution Time

Program execution time depends upon the "length" of the Y-axis to be plotted.

I. Check Out Status

This program has been thoroughly tested. It has been used regularly by one installation for several months.

J. Sample Problem Running Time

The sample problem will run approximately one minute on a 1620-1443 Model 1 and approximately 30 seconds on a 1620 Model II.

K. Comments

This program and its documentation were written by an IBM employee. It is being submitted for general distribution to interested parties in the hope that it might prove helpful to other members of the data processing community. The program and its documentation are in the author's original form. IBM serves only as the distribution agency in supplying this program. Questions concerning the use of the program should be directed to the author's attention.

DETAILED PROGRAM DESCRIPTION

The program reads in parameters that indicate the title of the plot (TITLE), the date of the plot (DATE), the title of the Y axis (YAX1, YAX2), the title of the X axis (XAX), the character used to plot the data (DOT), the upper limit of the Y axis (ULIM), the scale of the interval between the lines of plotted output (GIN), the number of points to be plotted (IPAR), and the number of printed lines between indicative information on the Y axis (CONST).

Then the data to be plotted is read VALU (IPAR). The x print position of the point is obtained from the order of the data items on the input cards; that is, the first input data item will be considered to belong in the first print position along the X axis, the second input data item, in the second, etc. Each data item is the Y-coordinate of the point to be plotted. Note that the x print position is not to be confused with the X-coordinate. The X-coordinate is the x print position times some scale factor.

The program prints the title of the plot, the date of the plot, the title of the Y axis and then begins printing at the upper limit of the plot and decrements at regular intervals until it reaches the abscissa. At each interval the input data items (Y-coordinate values) are examined for a value corresponding to the value of the particular interval. If equals are found at an "interval level", the user's plot character will be printed at that "interval level", representing the Y-value, and in a print position as defined by the order of the input, representing the X-value. Values between interval levels will be plotted at the closest approximate interval. Interval identification is printed as per input parameters. When the plot is complete, the X axis title is printed, END OF JOB is typed, and the program waits at PAUSE 9 for further plots.

To print a new plot with more data items under the same titles for the X and Y axes, the user sets program switch "1" off and hits start. The program then reads a card with the new plot parameters and plot title.

To print a subsequent plot with new titles for the X and Y axes and possibly with a new plot character, the user puts program switch "1" on and hits start. This has the same effect as a "cold start".

PROGRAM MODIFICATION

If a Model II 1443 is available, the X axis can be extended beyond 113 positions in order to take advantage of the additional print capacity.

I/O FORMAT

INPUT

Card 1: Plot character/axis titles card

Column	Field Name	Purpose
1	DOT	Character Used to Plot
2	BLK	Blank Character
3-10	DATE	Date of Plot
11-14	YAX1	First Line of Y-AXIS Title
15-18	YAX2	Second Line of Y-AXIS Title
19-70	XAX	X-AXIS Title

Card 2: Plot parameter/plot title card

Column	Field Name	Purpose
1- 3	IPAR	Number of Data Items
4-13	ULIM	Upper Limit of Plot
14-23	GIN	Scale of Interval Between the Lines of Plotted Output
24-27	CONST	Number of Printed Lines Between Indicative Information on Y-AXIS
28-80	TITLE	Title of Plot

Card 3: First data item card

Column	Field Name	Purpose
1-10	VALU(1)	Y-Coordinate for X-Print Position One
11-20	VALU(2)	Y-Coordinate for X-Print Position Two
.	.	.
.	.	.
.	.	.
71-80	VALU(8)	Y-Coordinate for X-Print Position Eight

There should be as many Y values (8 per card) as is indicated by IPAR on Card 2. The number of data item cards, of course, depends upon the number of Y-values.

Last card: Nines card

Column	Field Name	Purpose
1- 3	IPAR	Indicate Last Card

OPERATING INSTRUCTIONS

HOW TO PREPARE THE DATA

For card 1, choose character to plot, decide titles of X and Y axes. Then, keypunch this information along with the date of the plot in the column indicated in the section I/O Format.

For card 2, determine number of data items and the upper limit necessary for the plot. Choose the scale for the interval between plotted lines and the number of printed lines between indicative information on the Y axis. Keypunch this information along with the title of the plot in the columns indicated in the section I/O Format.

For data item cards, be certain to consider the sequence of the Y-values on the cards, as the sequence or order will define the X-print position.

HOW TO USE THE PROGRAM

1. Design the plot.
2. Change FORMAT statement number 5 and FORMAT statement number 41 to meet requirements and definition of specific plot.
3. Recompile program with new FORMAT statements.
4. Clear memory.
5. Load new object program.
6. Enter subroutines.
7. Enter data in following order:
   a) Plot character/axis title card
   b) Plot parameter/plot title card
   c) Data item cards
   d) Last 9's card
8. Ready the printer.

CONSOLE SWITCH SETTINGS

At initial start, all program switches are off. Thereafter, program switch "1" is put on to print a subsequent plot with new titles for the X and Y axes and possibly a new plot character, as well as new plot parameters. Program switch "1" is put off to print a subsequent plot with only new plot parameters and plot title.

PRINTER CARRIAGE TAPE

Channel 1 only - (if plot extends over one page, no page overflow is desired)

HALTS

Pause 9 - at which time switch "1" can be set on or off as required.

SAMPLE PROBLEM EXPLANATION AND OPERATING INSTRUCTIONS

The sample problem is intended to illustrate a typical plot. Essentially, the program plots test hours over a period of 113 months. Notice that the month corresponding to a particular number of test hours, Y-value, is a function of the order of the Y-value on the data item cards. The sample plot has been designed to require only one sheet of forms.

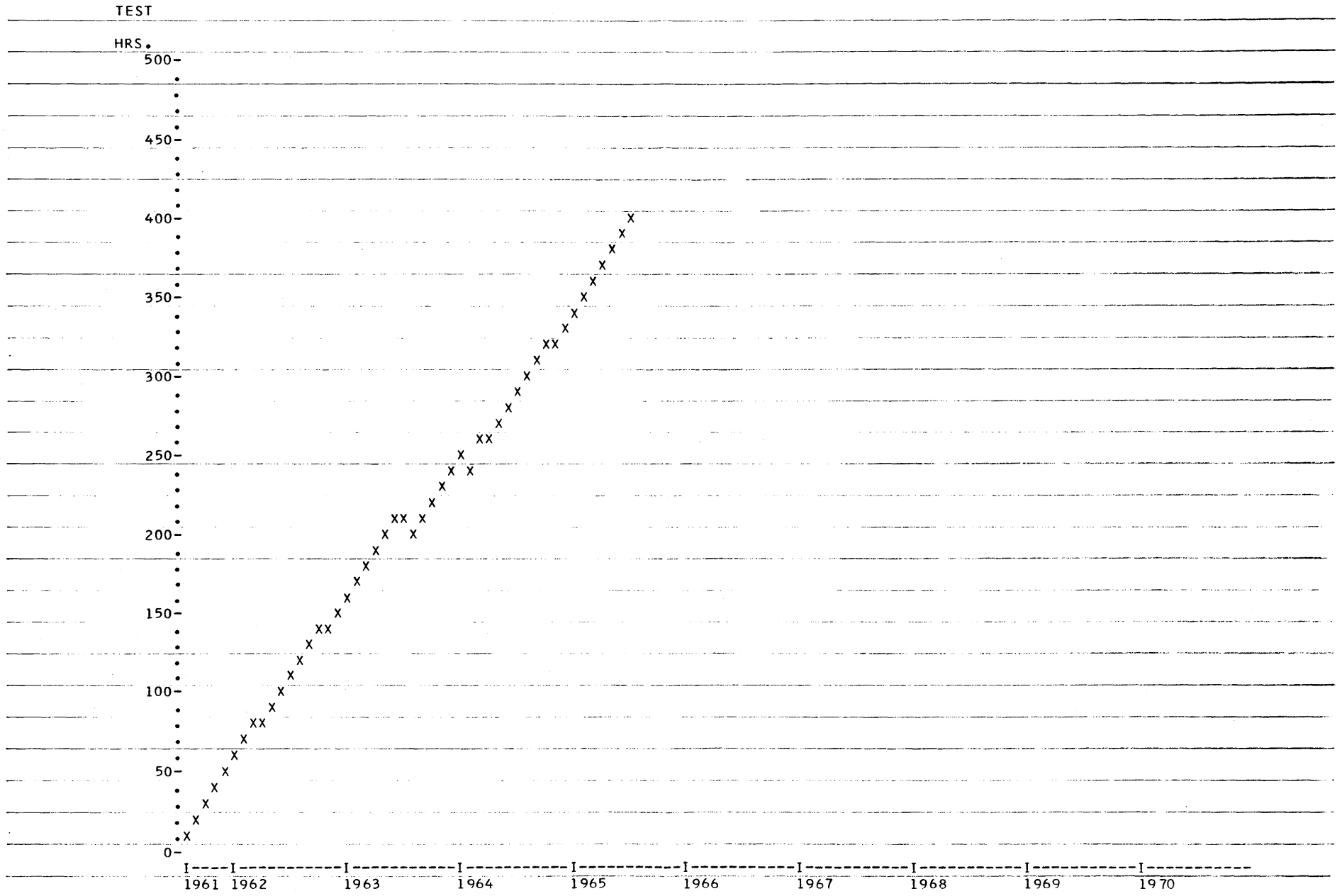
To run the sample problem:

1. Clear memory
2. Load the object program
3. Enter subroutines
4. Enter data in following order:
   a) Plot character/axis title card
   b) Plot parameters/plot title card
   c) Data item cards
   d) Last 9's card
5. Ready the printer

On the following page is the plot produced from the sample program data. SUGGESTION: The installation using this plot program has microfilmed the plots and then enlarged them to desired size for reporting forms.

SAMPLE PLOT FOR MASLP-10-IXP

10/27/64



12.

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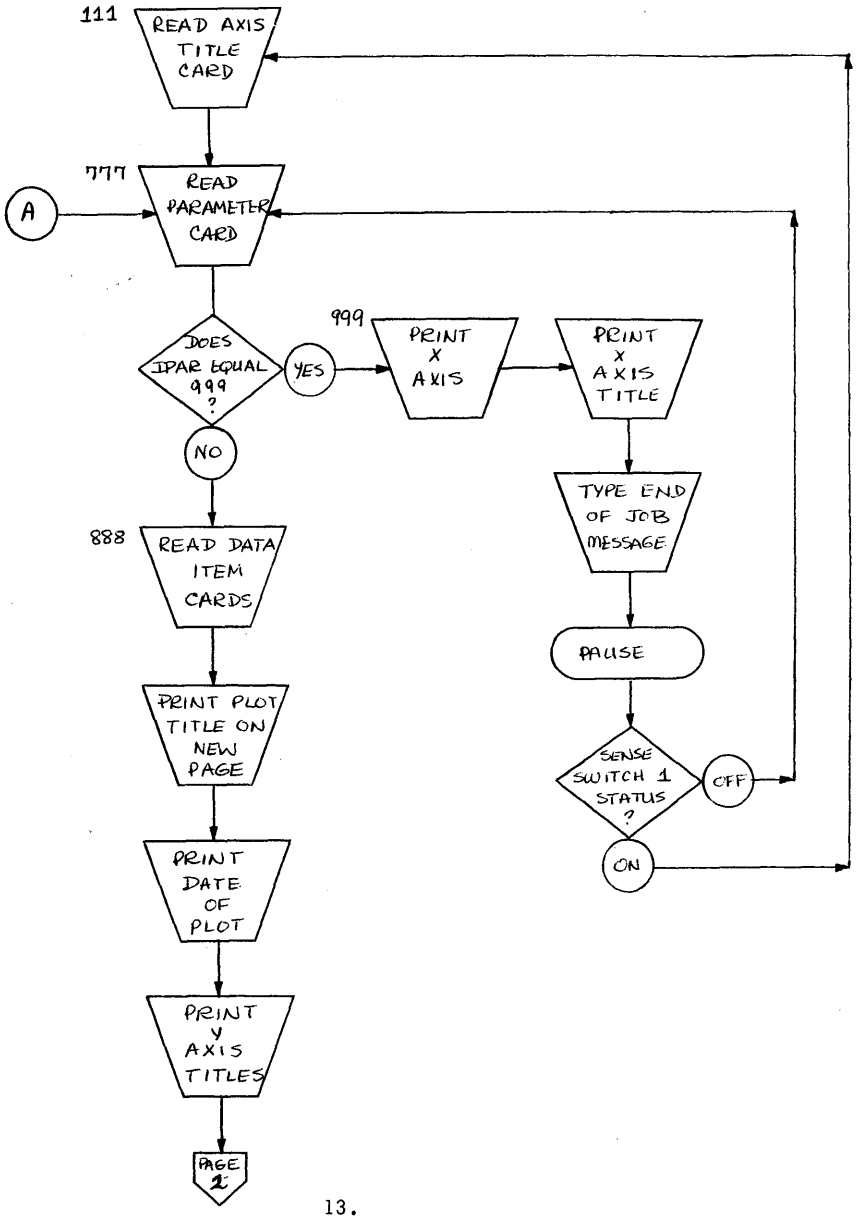
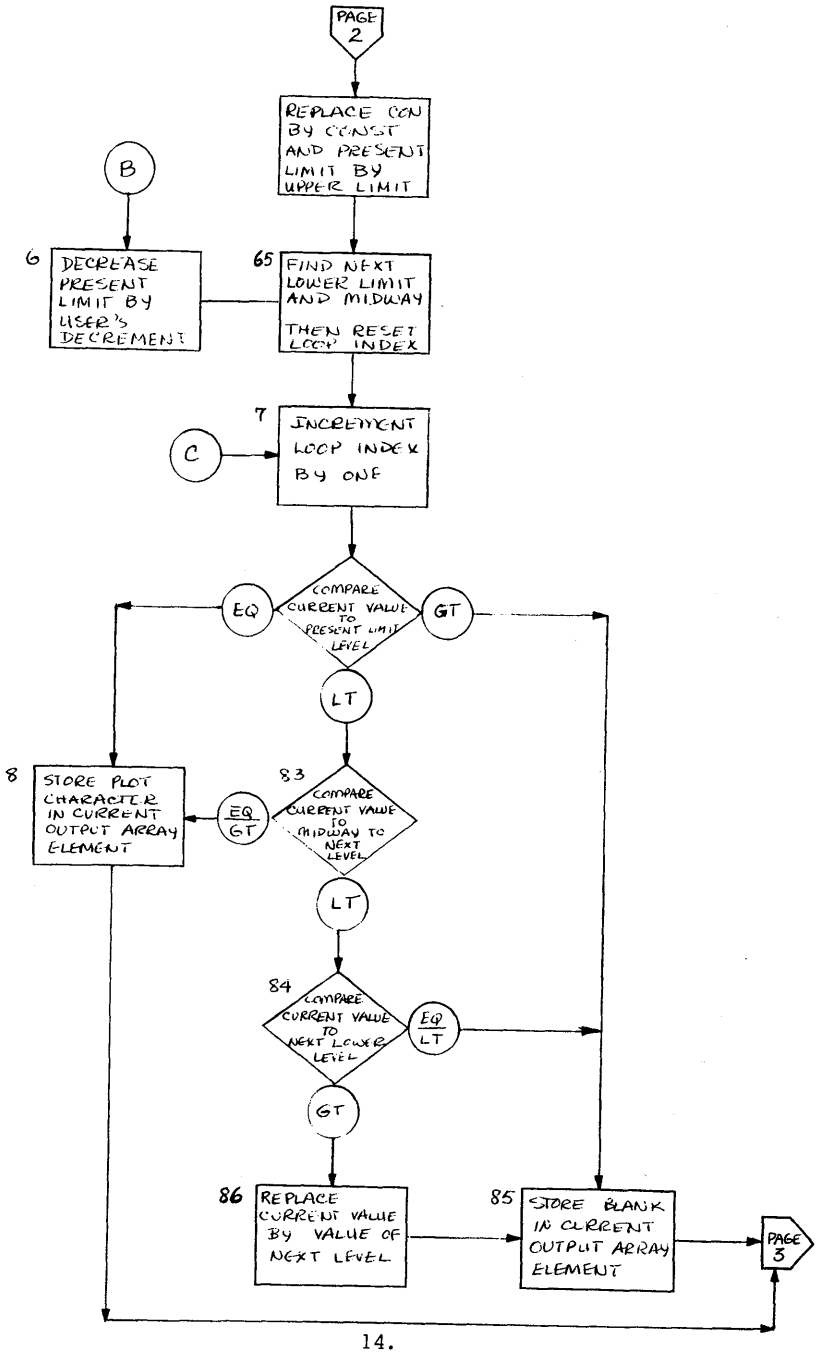
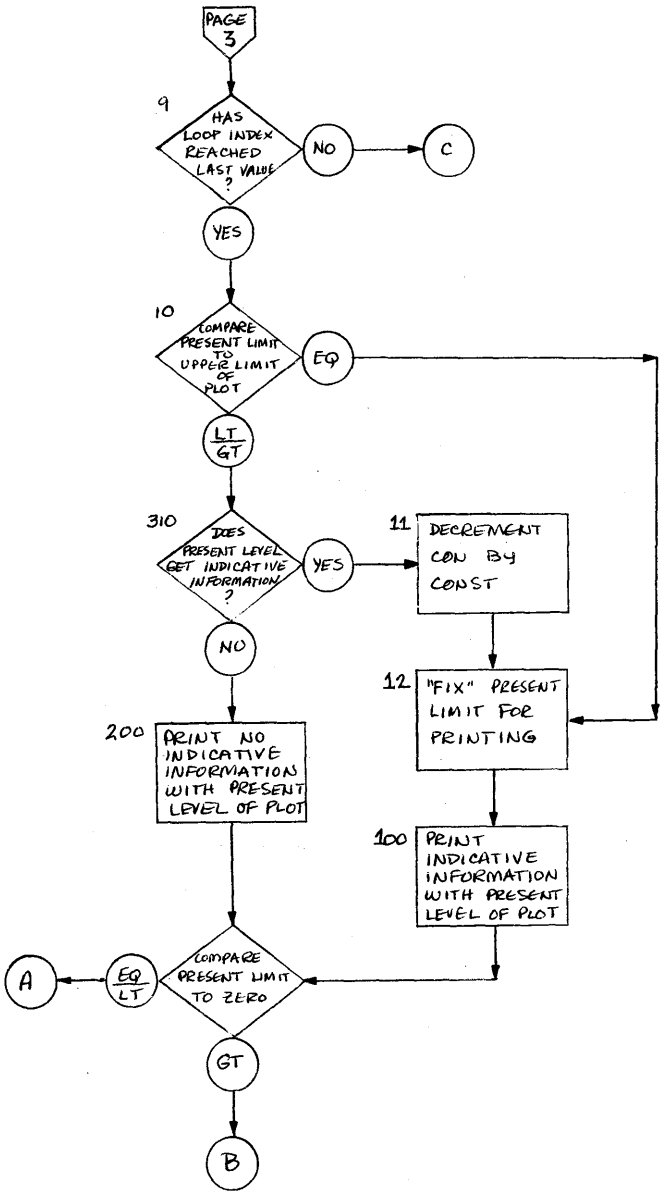
BLOCK DIAGRAM FOR MASLP-10-IXP








```
 1            DIMENSION TITLE ( 13),VALU(113),SPOT(113),XAX(13),DATE(2)
 2        111 READ 1,DOT ,BLK,DATE,YAX1,YAX2,XAX
 3          1 FORMAT (2A1,4A4,13A4)
 4        777 READ 2 , IPAR, ULIM, GIN,CONST,TITLE
 5          2 FORMAT (I3,2F10.0,F4.0,13A4)
 6            IF(IPAR-999)888,999,999
 7        888 READ 3, (VALU(IT),IT=1,IPAR,1)
 8          3 FORMAT (8F10.0 )
 9            PRINT 4,TITLE
10          4 FORMAT (1H1,29X,13A4,/)
11            PRINT 38, DATE
12         38 FORMAT (1HO,68X,2A4)
13            PRINT 39, YAX1
14         39 FORMAT (1HO,A4)
15            PRINT 40, YAX2
16         40 FORMAT (1HO,A4)
17            CON=CONST
18            PLIM=ULIM
19            GO TO 65
20          6 PLIM=PLIM-GIN
21         65 TEMP2=PLIM-(GIN/2.)
22            TEMP = PLIM-GIN
23            IT=0
24          7 IT=IT+1
25            IF (VALU(IT)-PLIM) 83,8,85
26         83 IF ( VALU(IT)-TEMP2)84,8,8
27         84 IF ( VALU(IT)-TEMP)85,85,86
28         86 VALU(IT) = TEMP
29            GO TO 85
30          8 SPOT(IT)=DOT
31            GO TO 9
32         85 SPOT(IT)=BLK
33          9 IF ( IT-IPAR ) 7,10 ,10
34         10 IF ( PLIM-ULIM) 310,12,310
35        310 IF ( PLIM-(ULIM-(CON*GIN)))200,11,200
36         11 CON=CON+CONST
37         12 LIM=PLIM
38        100 PRINT 110, LIM, (SPOT(IT),IT=1,IPAR,1)
39        110   FORMAT(1H ,I6,1H-,10A1,10A1,10A1,10A1,10A1,10A1,10A1,10A1,10A1,
              110A1,3A1)
40            GO TO 220
41        200 PRINT 210,(SPOT(IT),IT=1,IPAR,1)
42        210   FORMAT(7H       ,1H.,10A1,10A1,10A1,10A1,10A1,10A1,10A1,10A1,
              110A1,10A1,3A1)
43        220 IF(PLIM)777,777,6
44        999 PRINT 5
45          5 FORMAT (8H        ,113HI----I----------I----------I----------I-
              1----------I----------I----------I----------I----------I-------
              2----)
46            PRINT 41
47         41 FORMAT (8H        ,113H1961 1962        1963        1964        19
              165        1966        1967        1968        1969        1970
              2    )
48            PRINT 42  ,     XAX
```

```
   42 FORMAT (1HO,29X,13A4,//)
998 FORMAT (12H END OF JOB.,//)
    TYPE 998
    PAUSE 9
    IF ( SENSE SWITCH 1 ) 111,777
    END
```

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