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EUROPEAN ATOMIC ENERGY COMMUNITY - EURATOM

AN IBM 1800 PROGRAM PACKAGE FOR ON-LINE AND OFF-LINE OPERATION OF A CALCOMP DIGITAL INCREMENTAL PLOTTER

by

H. SCHMID

1969

Joint Nuclear Research Center
Geel Establishment - Belgium

Central Bureau for Nuclear Measurements - CBNM

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The plotter programs permit three different modes of plotter operation :

1. The plotter is operated by a Calcomp magnetic tape unit 570 (7 tracks). The tapes for this unit are prepared by the IBM 1800 computer.

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The plotter programs permit three different modes of plotter operation :

1. The plotter is operated by a Calcomp magnetic tape unit 570 (7 tracks). The tapes for this unit are prepared by the IBM 1800 computer.

2. The plotter is operated on-line with the IBM 1800 computer as a slow input/output device working with character interrupts.
3. Plotter data are buffered on magnetic tape. The plotter is working on-line with the IBM 1800 computer in time-sharing mode.

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ABSTRACT

A set of IBM 1800 programs for on-line and off-line operation of a Calcomp digital incremental plotter using 8-vector input command format is described. All subroutines are written in ASSEMBLER language and can be called by FORTRAN or ASSEMBLER main programs. Data stored as arrays or calculated by a user-written subprogram can be plotted with linear and/or logarithmic scales.

The plotter programs permit three different modes of plotter operation :

1. The plotter is operated by a Calcomp magnetic tape unit 570 (7 tracks). The tapes for this unit are prepared by the IBM 1800 computer.
2. The plotter is operated on-line with the IBM 1800 computer as a slow input/output device working with character interrupts.
3. Plotter data are buffered on magnetic tape. The plotter is working on-line with the IBM 1800 computer in time-sharing mode.

KEYWORDS

PROGRAMMING
PLOTTERS
DIGITAL SYSTEMS
COMPUTERS

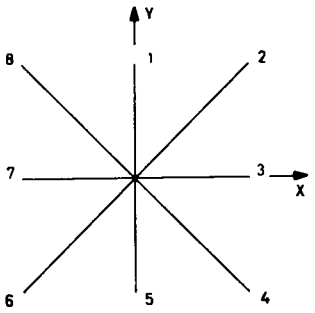
Contents Page

AN IBM 1800 PROGRAM PACKAGE FOR ON-LINE AND OFF-LINE OPERATION OF A CALCOMP DIGITAL INCREMENTAL PLOTTER *)

1. Introduction

This report describes an IBM 1800 program package for on-line and off-line operation of a Calcomp digital incremental plotter using 8-vector input command format (see below).

The Calcomp plotter is constructed for plotting one variable against another variable in digital incremental steps. X-axis movement is caused by rotating the chart paper under the pen. Y-axis deflection is caused by lateral movement of the pen carriage. Appropriate combinations of the carriage motion, rotating the drum and pen-up and pen-down movements are utilized to produce 10 different pen motions which are the basic elements for all designs: pen-up, pen-down and steps in 8 basic directions as shown in the figure (so-called 8-vector input command format).



8-vector input command format

The length of each step is
0.01 inch for Calcomp models 560, 563, 565 and IBM 1627,
0.005 inch for Calcomp models 564 and 566 and
0.01 cm for Calcomp model 506.

The programs of this report refer to model 506. However, they can easily be modified for plotters with step length of 0.005 inch. For plotters with increments of 0.01 inch the specification "centimeter" has to be changed into "inch" in the following descriptions.

The plotter can receive the commands for plotter operation by a Calcomp magnetic tape unit (off-line operation) or directly by the IBM 1800 computer (on-line operation).

The programs supplied by IBM (1) are only basic subroutines, so that there is a considerable programming effort for only simple drawings. Furthermore the possibility of logarithmic scales does not exist and there are no programs provided to operate the plotter in time sharing mode. The following subroutines are independent from the IBM routines, they are entered by CALL statements and parameters are transmitted by the standard method for IBM 1800 FORTRAN, except for three subroutines which are not to be utilized by the user. The programs do not need the plotter and the magnetic tape to be mentioned in the *IOCS control card. All subroutines are written in ASSEMBLER language and may be called by FORTRAN or ASSEMBLER main programs in STANDARD PRECISION. All subroutines save and restore the 3 index registers, but do not save accumulator, Q-register and the status indicators. They have been written for IBM 1800 Time Sharing Execute System (TSX), however a part of them can be changed to run in Card/Papertape System.

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*) Manuscript received on 27 November 1968.

The subroutines require the following machine configuration:

1443 printer for error messages
1053 typewriter for messages for plotter operation mode 3 (see below)
1442 card reader)
2402 magnetic tape) only required for plotter operation mode 1 and 3 (see below)
2310 disk
Calcomp plotter

The necessary variable core depends on the number of subroutines used. About 2900 memory locations are necessary for a complete package with linear scales (DESSN) and about 4900 for a complete package with linear or logarithmic scales (DESLF), but without the IBM library subroutines.

The plotter programs permit the plotting of data stored in arrays and/or calculated by a user-written subroutine with linear and/or logarithmic scales.

Three different modes of plotter operation are provided:

1. The plotter is operated off-line by a Calcomp magnetic tape unit 570 (7 tracks, 200 bytes/inch). The tapes for this unit are prepared by the IBM 1800 computer.
2. The plotter is operated on-line with the IBM 1800 computer similar to any other slow input/output device working with character interrupts.
3. The plotter is operated on-line with the IBM 1800 computer in time-sharing mode. Plotter data for one or more plots are buffered on magnetic tape (7 or 9 tracks). The plotter is started by a process program reading tape data into a memory buffer. Whenever the memory buffer is empty an interrupt is initiated so that new tape data can be read.

This manuel contains the description and the listings of the complete subroutine package, however for nearly all designs it is sufficient to use the subroutines PLOT/PLTIR/FINIM/FINTR, SYMBL, DESSN, DESLG, DESNF and DESLF. Furthermore a detailed description of the three plotter operation modes is given as well as the listings and block diagrams of the interrupt programs, which are used when the plotter is operated on-line in time-sharing mode.

The following subroutine set represents in principle an IBM 1800 version of the Calcomp subroutines of EURATOM Ispra, Italy, written for the computers IBM 7090 and 360 and published by P. Moinil and J. Pire (2). The subroutines already existing have been rewritten in ASSEMBLER language for the IBM 1800 without those ones concerning polar coordinates. But they have been extended in that way, that the data have not necessarily to be stored as arrays but they can be calculated or read from an external storage at plotting time by a user-written subroutine. This is a great advantage for small computers, where the number of necessary memory locations play an important part.

2. Different Modes for Plotter Operation

2.1. Off-Line Operation of the Calcomp

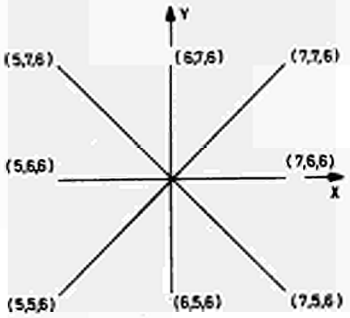
The plotter is operated by a Calcomp magnetic tape unit 570 for 7 tracks. The tapes for this unit are prepared by the IBM 1800 computer in the following original Calcomp code (3):
Plotter data records are separated by block address records, which serve for identification. Only three tracks of the 7-track tape are read by the tape unit 570.

Block address records (Fig. 1) begin with ten 4's, seven 3's and one 1. The next 6 character determine a three digit decimal block address, which is 1 for the begin of the first design, 2 for the second and so on. The 6 block address characters are followed by the 18 synchronisation characters in reverse order. For the purpose of synchronisation the block address data have to be separated from the plotter data by about 5 cm of tape. This can be done by elongating the block address record by about sixty 4's.

Plotter data records (Fig. 2) begin with the same 18 synchronisation characters as the block address records, except that the last must be a 2. The plotter data are recorded in groups of 3 characters. The first character in a group determines the X-motion, the second the Y-motion, and the third the pen-up or pen-down movement as shown in the following table:

	1st char.	2nd char.	3rd char.
7	+X	+Y	pen-down
5	-X	-Y	pen-up
6	no-action	no-action	no-action

The ten possible triplets for the 10 pen motions therefore are:



pen-up (6, 6, 5)
pen-down (6, 6, 7)

Since the pen-up or pen-down motion takes more time than the horizontal pen-motions, about 70 no-action characters (6's) have to be inserted after each pen-up or pen-down triplet. Each plotter data record should be terminated by a 4634 code.

The tape density is 200 bytes/inch.

This method has the advantage not to use valuable computer time for the slow Calcomp plotter. But there is the disadvantage that only one reel can be used for one job, because the Calcomp unit requires each new reel to begin with a block address. However the changing of reels in the IBM 1800 TSX system is controlled by EAC (Error Allert Control) and the programmer has no possibility to start the new reel with a block address.

2.2. On-Line Operation of the Calcomp as slow Input/Output Device

The plotter is operated on-line with the IBM 1800 computer as any other slow input/output device working with character interrupts. In this case the subroutines use the IBM library subroutine PLOTX which has a small buffer of 50 memory locations. However for large plots the IBM 1800 is occupied for a long time looping in the subroutine PLOTX and waiting until a part of the buffer is free for new data. In this mode the plotter subroutines use a minimum of memory locations.

2.3. On-Line Operation of the Calcomp in Time-Sharing Mode

The plotter is operated on-line with the IBM 1800 computer. Plotter data for one or more plots are buffered in the following compact format on magnetic tape. 9 or 7-track tapes can be used. A record has a maximum length of 320 computer words. The first word contains the word count in bit 6-15, bit 0 indicates the last record for a design. Each of the remaining words contains information for 4 plotter steps where 1 to 8 specify the 8 basic directions, 9 pen-down, A pen-up and B-F are not used. If the last word is not complete with 4 plotter steps it is filled up with zeroes. The very last design is terminated by an end-of-file mark (EOF).
The plotting of data buffered on magnetic tape is controlled by TSX interrupt programs (CONSL,PLOTD, PLOTL, PLOTO, PAREA and USER). The execution of a plot is started by consol interrupt with sense switch 4 and 5 on, all others off. The servicing program named CONSL with subroutine PLOTD reads the logical tape number from sense switch 6 and 7 and stores it in skeleton. Then program CONSL initiates via subroutine PLOTO a CALL LEVEL to a low interrupt level (Fig. 3). The servicing program for this level(named PLOTL) is an interrupt core load and reads a number of records from magnetic tape to a data file on disk (PLOTA) and calls a plotting program PLOTO in skeleton. Subroutine PLOTO reads one sector from disk into a skeleton area PAREA and executes the first XIO instruction to start the plotter. Then control is returned via the level program PLOTL to the master interrupt control program (MIC) and the IBM 1800 computer is free for other work.

Depending on the plotter model and the pen movement to be executed the service complete interrupt arrives between 3 and 10 msec later. The interrupt response routine is included in subroutine PLOTO which initiates the following plotter step until the buffer is empty. Then PLOTO reads the next sector from disk etc. When all sectors are plotted a CALL LEVEL is executed and the procedure is repeated with interrupt core load PLOTL (Fig. 4).

The programs have been used with the following level assignment:

Calcomp plotter	.... level	8
CONSL	.... level	12
PLOTL	.... level	14

If the IBM 1800 system executes a RESTART procedure plot operation is not affected, because the skeleton is not changed. If there is a RELOAD plot operation is terminated. To avoid this difficulty some indicators and the buffer area can be storage protected by setting the storage protection switch on. In this case a part of EAC (Error Allert Program) must be changed to avoid the error message:
WOR xxxx IN SKELETON DIFFERS FROM SKEL ON DISK - GO TO COLD START.

Operation procedure at system generation time:

1) Assemble subroutines PAREA, PLOTD, PLOTO and USER and store them in the relocatable users area.
2) Build or rebuild the skeleton with PAREA and PLOTO included. PLOTO and PAREA occupy 586 core locations.
3) Rebuild all core image programs because the interrupt response routine for the plotter is included in skeleton.
4) Open a data file with name PLOTA with about 16 or more sectors (STOREDATA).
5) Clear the file protection of PLOTA (DWRAD).
6) Assemble program CONSL and build an interrupt core load assigned to the programmed interrupt corresponding to the consol interrupt with sense switch 7 off.
7) Assemble program PLOTL and build an interrupt core load assigned to the programmed interrupt of a low level. If another level than level 14 is chosen the CALL LEVEL instruction in card PLOTO104 must be changed.
8) Clear subroutine PLOTX of the IBM 1800 library and assemble and store the IBM 1800 program package with PLOT3, but without PLOT1 and PLOT2.
   Note: Plot operation mode 2 and 3 cannot be used interchangeable with the same TSX system disk.

Operating procedure at plotting time:

1) Mount a scratch tape on a tape unit and prepare the tape card **n (see description of PLOT3 in 3.02). Execute the job which prepares the Calcomp tape using subroutine PLOT3. Rewind the tape after execution of one or more jobs.
2) Press consol interrupt with sense switch 4 and 5 on, all others off. The following message is printed on the typewriter:
   CONSOL INTERRUPT - PROGRAM SELECTED = PLOT PROGRAM
   ENTER MAG. TAPE NO. THROUGH SENSE SWITCHES - START.
   Set sense switch 6 and 7 to the magnetic tape number and press consol start. The sense switches are read and stored in skeleton.
   The following message is printed:
   PLACE SSW 4, 5 AND 6 TO CONTROL PLOT OPERATION - START.
   Set the switches as follows and press consol start:

Sense switch	4	ON	Stop after each design.
		OFF	Stop only after EOF.
	5	ON	Stop the plot operation immediately and reset all indicators. To continue with another plot go to step 2). Plotter data on disk and in memory are lost.
		OFF	Normal operation.
	6	ON	Stop the plot operation immediately, but save all indicators and plotter data on disk and in memory. Continuation of this design is possible by going to step 2).
		OFF	Normal operation.

   Sense switch 4, 5 and 6 may be set at any time.
3) The following messages may occur at plotting time. In each case plotting is terminated. To continue or to start again go to 2).
   END OF BLOCK FOR PLOTTER - TIME = XXXXX (occurs if SSW4 is on).
   PLOTTER TAPE NOT READY - TIME = XXXXX
   TAPE ERROR - TIME = XXXXX
   PLOTTER ERROR - STOP PLOTTING (occurs on Calcomp parity error or plotter not ready).

The characteristics of the interrupt programs are the following:

PAREA

Type of program: Subroutine to be included in skeleton.

Entry point with calling sequence (only ASSEMBLER):

```
CALL    PAREA    (implicit utilization of external symbols)
ORG     *-2
DC      /....
BSS     1
```

Subroutines called by PAREA: none

Core locations used: 324 (144 hexadec.)

Description:

PAREA Subroutine PAREA contains a location for storage of the magnetic tape number and a buffer of 322 words to store one sector of plotter data.

PLOTO

Type of program: Subroutine to be included in skeleton.

Entry point with calling sequence:
CALL PLOTO

Subroutines called by PLOTO: TYPEN, DISKN, LEVEL) IBM 1800 library

PAREA

Core locations used: 262 (106 hexadec.)

Description:

PLOTO Subroutine PLOTO has the most important function when the plotter is operated in time sharing mode. It constructs and executes the XIO operations to control the plotter, decides if new data have to be read from disk or not and when a CALL LEVEL should be executed. It also contains the interrupt response routine for the service complete interrupt of the plotter. Each time when it is entered it reads the sense switches and stops the operation if desired.

PLOTD

Type of program: Subroutine

Entry point with calling sequence:
CALL PLOTD

Subroutines called by PLOTD:

TYPEN	) IBM 1800 library
PAUSE	
PAREA	
PLOTO	

Core locations used: 106 (6A hexadec.)

Description:

PLOTD Subroutine PLOTD is called by a general program servicing the consol interrupt with sense switch 7 off.
PLOTD writes messages on the type-writer (see operation procedure at plotting time, point 2.), reads the magnetic tape number from the sense switches and branches to subroutine PLOTO. PLOTD does not save any index registers, accumulator or Q-register.

USER

Type of program: Subroutine

Entry point with calling sequence (only ASSEMBLER)

```
          CALL      USER
          DC        EOFSW
          .
          .
          .
EOFSW     DC        0
ERRSW     DC        0
TOLSW     DC        0
LNGTH     DC        0
```

Subroutines called by USER: none

Core locations used: 38 (26 hexadec.)

Description:

USER Subroutine USER is to be used as the special condition routine for the read operation in the MAGT routine. It tests the accumulator and sets the switches EOFSW, ERRSW, TOLSW, and LNGTH in the following way:

EOFSW is set non zero if an end-of-file mark has been read.

ERRSW is set non zero if tape errors were detected.

TOLSW is set non zero if the record on tape was longer than the I/O buffer.

LNGTH gives the channel word count at the end of the operation. This length must be added to the length in the I/O area to obtain the real length of the record.

It is the responsibility of the calling program to reset all switches before a tape operation is executed.

CONSL

Type of program: Main program (interrupt core load)

Subroutines called by CONSL: TYPEN, INTEX) IBM 1800 library; PLOTD

Core locations used: 38 (26 hexadec.)

Description:

CONSL Program CONSL has to be assigned to the programmed interrupt corresponding to consol interrupt with sense switch 7 off. It controls sense switch 4 and 5 and if both are on and all others off, it calls program PLOTD. Using other sense switch combinations program CONSL can be extended for other functions.

PLOTL

Type of program: Main program (interrupt core load)

Subroutines called by PLOTL:

TYPEN, INTEX, MAGT, DISKN, CLOCK, BINDC, HOLPR	IBM 1800 library
USER	
PAREA	
PLOTL	

Data files on disk used by PLOTL: PLOTA (as long as possible, file protection must be cleared).

Core locations used: 620 (26C hexadec.)

Description:

PLOTL Program PLOTL is an interrupt core load assigned to a low interrupt level (these programs use level 14). PLOTL is started by subroutine PLOTQ via a CALL LEVEL statement. It reads records from magnetic tape (the number of records is defined by the length of the data file PLOTA), and stores them on disk in the data file PLOTA and calls subroutine PLOTO. It controls sense switch 4 and stops the operation if necessary.

3. The IBM 1800 Calcomp Program Package

The IBM 1800 program package for the Calcomp plotter consists of the

basic subroutines
- PLOT/PLTIR/FINIM/FINTR
- SYMBL
- NUMBR

the subroutines for data stored as arrays

for linear plots
- MXMN
- DXDY/SCALN
- AXIS
- SCLIN/SCDAS
- SCMRK
- DESSN

for logarithmic plots
- MXMNL
- DXLG
- SCALG
- AXLOG
- SCLLG/SCDLG
- SCMLG

for linear and/or logarithmic plots
- LINE/DASH
- MARK
- LINSC/DASSC
- MRKSC
- DESLG

the subroutines for data stored as arrays and/or calculated by a user-written subroutine

for linear plots
- MXMNF
- SCLIF/SCDAF
- SCMRF
- DESNF

for linear and/or logarithmic plots
- MXMLF
- LINSF/DASSF
- MRKSF
- DESLF

and the subroutines not to be called by the user
- EIFIX/EFLT
- BNEBC
- TABLG

According to the three different modes of plotter operation there are three different subroutines PLOT labeled PLOT1, PLOT2, PLOT3. All other subroutines are independent from the plotter operation mode.

The subroutines are described in the order of the calling hierarchy.

3.01 EIFIX

Entry points with calling sequences:

```
LIBF      EIFIX
LIBF      EFLT
```

Subroutines called by EIFIX: none

Core locations used: 90 (51 hexadec.)

Description:

EIFIX The floating point number in FAC (floating point accumulator) is converted to a double word integer in accumulator and Q-register. Bit 12 of word 55 in the level work area is set to 1 if the integer exceeds the maximum ($2^{31}-1$) or the minimum (-2^{31}) value.

EFLT The double word integer in accumulator and Q-register is converted to floating point number in FAC.

The subroutine is re-entrent.

3.02 PLOT1, PLOT2, PLOT3

Entry points with calling sequences:

```
CALL PLOT (X, Y, I)
CALL PLTIR (X, Y, I)
CALL FINIM (X, Y)
CALL FINTR
```

Subroutines called by PLOT1 and PLOT3:	FLD FMPY CARDN PRNTN PAUSE MAGT	IBM 1800 library
Subroutines called by PLOT2:	EIFIX FLD FMPY PLOTX EIFIX	IBM 1800 library

Core locations used by PLOT1:	788 (314 hexadec.)
by PLOT2:	240 (F0 hexadec.)
by PLOT3:	708 (2C4 hexadec.)

Description:

PLOT — Subroutine PLOT causes the pen to be moved from its present position on the chart to the point with the coordinates X and Y (floating point variables in cm). This motion is carried out with pen-down if I = 2 and pen-up if I = 3. For all other values of I the pen is not changed by PLOT. The coordinates of the pen position on the chart at the first call for PLOT are considered as origin (0., 0.).

PLTIR — PLTIR has the same function as PLOT except that a dashed line is drawn, dash length is 0.3 cm. This motion is carried out starting with pen-down if I = 2 and pen-up if I = 3. For I = 0 the subroutine decides if the line begins with pen-up or pen-down which may be important for strongly curved lines.

FINIM — Subroutine FINIM moves the pen in pen-up position to the point (X, Y), which is regarded as new origin after the execution of FINIM. Furthermore FINIM terminates the preceding design.

FINTR — After the last design has been finished by FINIM, FINTR indicates the final end of all designs.

The maximum absolute value for X and Y is 327.67 cm.

The different functions of the three versions PLOT1, PLOT2 and PLOT3 are the following:

a) off-line mode (PLOT1)

When the subroutine is entered the very first time a card of the form is read

**n

where n in card col. 3 is the magnetic tape unit number (0 to 3). Then the subroutine writes the block address 1 on tape. The subroutine contains a buffer of 300 memory words into which the plotter data are stored. Each time the buffer is full, the data are written on tape. A call for FINIM causes the buffer to be written on tape even when it is not full. Therefore it is necessary to finish each design by CALL FINIM to make sure that all calculated plotter data are written on tape. Furthermore FINIM sets an indicator which causes the following design to begin with a new block address. The block address is incremented by 1 each time it is written on tape. FINTR writes a final block address on tape. Only 7 track tapes can be used.

b) on-line mode (PLOT2)

PLOT2 is the shortest version of the PLOT programs. It calls the PLOTX routine of the IBM library. Entry point FINTR has no meaning, it serves only for compatibility with the other versions.

c) on-line mode in time-sharing (PLOT3)

When PLOT3 is entered the first time a tape card is read as in PLOT1. The subroutine contains a buffer of 320 words into which the plotter data are stored - 4 steps per word. Each time the buffer is full, the plotter data are written on tape. A call for FINIM sets an end-of-design indicator in the first word and writes the buffer on tape even when it is not full. Each design has to be finished by FINIM.
FINTR writes an end-of-file mark on tape. 9 and 7-track tapes may be used, tape density is 800 bytes/inch.

3.03 SYMBL

Entry point with calling sequence:
CALL SYMBL (X, Y, THETA, EBC, N)

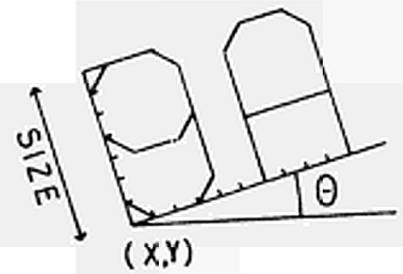
Subroutines called by SYMBL:

FLD/FLDX/FSTO/FSTOX FADD/FADDX/FSUB/FSUBX FMPY FSINE/FCOS HOLEB HOLPR	IBM 1800 library
PLOT	

Core locations used: 626 (272 hexadec.)

Description:

SYMBL Starting with the coordinates X and Y subroutine SYMBL designs a character string of N symbols with the height SIZE (floating point variables in cm) in the direction of the angle THETA in degrees (floating point variable) with the positive X-direction. The coordinates X and Y are the lower left-hand coordinates of the first character except for the centered symbols for which (X, Y) are the coordinates of the centre. The width of the symbols is 4/7 of the height, the distance between two symbols is 2/7 of the height. EBC is the lower address of an array containing the character string in EBCDIC format. In FORTRAN EBC may be defined by a DATA statement or the characters may be read as input data with format A4. Attention must be paid that the text has to be stored in ascending order in memory (inverse to FORTRAN). In ASSEMBLER the EBC statement fulfils these conditions. For negative N the coordinates X and Y are changed by the execution of SYMBL in this way that they contain the coordinates of the end of the character string. This may be helpful for a continuation of the plotted text. Of course for negative N X and Y must not be constants but variables.



All characters available by subroutine SYMBL with the corresponding card and EBCDIC code are given in the following table. The last five characters (marked by C) are centered symbols.

CHARACTERS AVAILABLE BY SUBROUTINE SYMBL

EBCDIC CODE	CHAR	CARD CODE	EBCDIC CODE	CHAR	CARD CODE
C1	A	12-1	F6	6	6
C2	B	12-2	F7	7	7
C3	C	12-3	F8	8	8
C4	D	12-4	F9	9	9
C5	E	12-5	4E	+	12-8-6
C6	F	12-6	60	-	11
C7	G	12-7	4D	(	12-8-5
C8	H	12-8	5D	)	11-8-5
C9	I	12-9	61	/	0-1
D1	J	11-1	7E	=	8-6
D2	K	11-2	6B	,	0-8-3
D3	L	11-3	4B	.	12-8-3
D4	M	11-4	40	BLANK	
D5	N	11-5	5C	*	11-8-4
D6	O	11-6	6C	%	0-8-4
D7	P	11-7	5B	$	11-8-3
D8	Q	11-8	7C	@	8-4
D9	R	11-9	6E	>	0-8-6
E2	S	0-2	4C	<	12-8-4
E3	T	0-3	7A	:	8-2
E4	U	0-4	7F	"	8-7
E5	V	0-5	7B	#	8-3
E6	W	0-6	50	&	12
E7	X	0-7	4F	|	12-8-7
E8	Y	0-8	6F	?	0-8-7
E9	Z	0-9	7D	'	8-5
F0	0	0	4A C	+	12-8-2
F1	1	1	5F C	×	11-8-7
F2	2	2	5A C	✱	11-8-2
F3	3	3	6D C	□	0-8-5
F4	4	4	5E C	◇	11-8-6
F5	5	5			

3.04 BNEBC

Entry point with calling sequence (only ASSEMBLER):

```
CALL    BNEBC
DC      DEST
```

Subroutines called by BNEBC: none

Core locations used: 152 (98 hexadec.)

Description:

BNEBC The double precision integer in accumulator and Q-register is converted to EBCDIC format and is stored in DEST through DEST+5.

3.05 NUMBR

Entry point with calling sequence:
CALL NUMBR (X, Y, SIZE, THETA, FLOAT, N)

Subroutines called by NUMBR:

FLD/FSTO FSUB/FSBR FMPY FAVL	IBM 1800 library
EIFIX/EFLT BNEBC SYMBL	

Core locations used: 168 (A8 hexadec.)

Description:

NUMBR Subroutine NUMBR transforms the floating point number in FLOAT to EBCDIC format (F-format) and plots the characters using subroutine SYMBL. Parameters X, Y, SIZE and THETA are the same as in SYMBL. N indicates the number of decimal positions behind the decimal point, maximal 11. N = 0 means no decimal positions, but the point is plotted. For N = -1 also the decimal point itself is suppressed. Preceding the decimal point a field of 6 characters is provided. The subroutine plots ** if there is an overflow.

3.06 MXMN

Entry point with calling sequence:
CALL MXMN (Y, N, K, YMAX, YMIN)

Subroutines called by MXMN: none

Core locations used: 154 (9A hexadec.)

Description:

MXMN Y specifies the first value of an array, K (negative or positive) is the step size in array Y. MXMN searches N values contained in the array Y with step size K and returnes the maximum value as YMAX and the minimum value as YMIN to the calling program.
The user should be informed about the way in which arrays, specially multi-dimensional arrays, are stored in memory.

Example:
DIMENSION A (2, 6)
A(1, 1 = 1.
A(1, 2) = 2.
:
A(1, 6) = 6.
A(2, 1) = 7.
:
A(2, 6) = 12.
CALL MXMN (A, 6, 2, YMAX, YMIN)
At this point is YMAX = 6.
YMIN = 1.
because the array has the following order in memory

A(1, 1) A(2, 1) A(1, 2) A(2, 2) ...

K = 2

A positive K corresponds to descending order, a negative K to ascending order in memory.

3.07 MXMNF

Entry point with calling sequence:
EXTERNAL CALCF
CALL MXMNF (Y, N, K, YMAX, YMIN, IF, CALCF)

Subroutines called by MXMNF: CALCF (see below)

Core locations used: 196 (C4 hexadec.)

Description:

MXMNF For IF = 0 MXMNF works like subroutine MXMN and parameter CALCF has no meaning.
For IF ≠ 0 MXMNF calculates N values by calling a user-written subroutine
SUBROUTINE CALCF (VALUE, NI, IF)
where VALUE means the calculated value,
NI signifies an integer variable running from 1 to N and IF has the same value as the input parameter IF in MXMNF. Parameter IF allows to use one subroutine CALCF for different calls to MXMNF.
Then MXMNF determines the maximum and minimum value of the N calculated values and returns them as YMAX and YMIN to the calling program. Other parameters than NI, IF may be introduced to the subroutine by COMMON statements. Of course, CALCF is a dummy name.

Note: Subroutine CALCF may also be used to read previously calculated data from an external buffer storage, for instance disk.

3.08 MXMNL

Entry point with calling sequence:
CALL MXMNL (Y, N, K, YMAXL, YMINL)

Subroutines called by MXMNL:

FLDX/FSTOX FADD FMPY FLN	IBM 1800 library
MXMN	

Core locations used: 58 (3A hexadec.)

MXMNL Parameters Y, N, K have the same meaning as in MXMN. MXMNL searches the maximum and minimum value of N values contained in the array Y with step size K, increments these values by 2^{-128} to avoid the calculation of log 0, and calculates the logarithms to the base 10. The results are returned to the calling program as YMAXL and YMINL. There is no check for negative values.

3.09 MXMLF

Entry point with calling sequence:

```
EXTERNAL CALCF
CALL MXMLF (Y, N, K, YMAXL, YMINL, IF, CALCF)
```

Subroutines called by MXMLF:

FLDX/FSTOX FADD FMPY FLN	IBM 1800 library
MXMNF	

Core locations used by MXMLF: 68 (44 hexadec.)

Description:

MXMLF For IF = 0 MXMLF works like subroutine MXMNL and parameter CALCF has no meaning.
For IF $\neq$ 0 MXMLF determines the maximum and minimum value of N values calculated by the user-written subroutine CALCF (see MXMNF), increments them by 2^{-128}, calculates their logarithms (base 10) and stores them in YMAXL and YMINL. There is no check for negative values.

3.10 DXDY

Entry points with calling sequences:
CALL DXDY (SIZE, YMAX, YMIN, DY, DY1, DL, NEXP)
CALL SCALN (SIZE, Y, N, K, YMIN, DY, DY1, DL, NEXP)

Subroutines called by DXDY:

FLD/FSTO	IBM 1800 library
FADD/FSUB/FSUBX	IBM 1800 library
FAVL	IBM 1800 library
FMPY/FMPYX	IBM 1800 library
FDIV	IBM 1800 library
FAXI	IBM 1800 library
SNR	IBM 1800 library
PRNTN	IBM 1800 library
DMPHX	IBM 1800 library
EXIT	IBM 1800 library
EIFIX/EFLT	
MXMN	

Core locations used: 480 (1E0 hexadec.)

Description:

DXDY Subroutine DXDY calculates the necessary parameters DY, DY1, DL, NEXP for plotting an axis of the length SIZE and the minimum functional value YMIN and the maximum functional value YMAX. Then it recalculates the minimum value so that YMIN corresponds to the assigned value of the first tic mark of the scale.
DY is the functional increment for 1 cm on the chart paper.
$DY1 * 10^{NEXP}$ is the functional increment between two tic marks, which have a distance of DL in cm. The exponent NEXP is chosen in that way that DY1 can be taken from the following table:

$DY/10^{NEXP}$	DY1	DL
10.	10.	1.
13.3333333	20.	1.5
16.	20.	1.25
20.	20.	1.
25.	25.	1.
33.3333333	50.	1.5
40.	50.	1.25
50.	50.	1.
66.6666667	100.	1.5
80.	100.	1.25

DY1 and NEXP will be used for subroutine axis.

SCALN

Subroutine SCALN searches the maximum and minimum value of N values contained in the array Y with step size K and utilizes these values to determine YMIN, DY, DY1, DL and NEXP which serve for the graduation of an axis of the length SIZE. Then it substitutes the N values in the array Y by new values according to the following formula:

$$Y' = \frac{Y-YMIN}{DY}$$

There is no check that the N values do not exceed the array Y.

If the subroutine detects an error, it prints a message and a core dump on the 1443 printer. This may occur for incorrect input values (f. i. YMAX <YMIN) or for ill-conditioned parameters, for instance:

```
YMIN = -0.1E + 38
YMAX=  0.1E + 38
SIZE =  10.
```

3.11 TABLG

Entry point with calling sequence (only ASSEMBLER):
CALL TABLG

Subroutines called by TABLG: none

Core locations used: 82 (52 hexadec.)

Description:

TABLG Subroutine TABLG contains tables with constants to be used in subroutine DXLG and AXLOG. TABLG may not be called by the user.

3.12 DXLG

Entry point with calling sequences:
CALL DXLG (SIZE, YMAXL, YMINL, DY, NT, K4, UNIT, JST)

Subroutines called by DXLG:

FLD/FSTO FADD/FADDX/FSUB/ FSUBX/FSBR FMPY FDIV/FDVR IFIX FLOAT FXPN FLN PRNTN DMPHX EXIT	IBM 1800 library
TABLG	

Core locations used: 300 (12C hexadec.)

Description:

DXLG Subroutine DXLG determines from the input values YMAXL and YMINL - previously calculated by MXMNL or MXMLF - the parameters DY, NT, K4, UNIT and JST which are necessary to design a logarithmic axis of the length SIZE. Then YMINL is recalculated as the functional value assigned to the first tic mark.
The meaning of DY, NT, K4, UNIT and JST are the following:
DY is the logarithm to the base 10 of the functional increment per 1 cm of the chart paper.
UNIT is the length in cm for one decade. (UNIT = 1./DY)
JST is an indicator for calculating UNIT.

For JST = 0 $\quad UNIT = \dfrac{SIZE}{YMAXL - YMINL}$

For JST $\neq$ 0 UNIT takes one of the values 27., 18., 12., 9., 6., 4., 2.5 or 1.

NT defines the type of logarithmic scale as shown in the following table:

NT	UNIT	Type of logarithmic scale
1	≥ 27.	1., 1.1, ... , 1.9, 2., 2.2, . . . , 3., 3.25, . . . , 4., 4.25, . . . , 5., 5.5, 6., 6.5, 7., 7.5, 8., 9., 1.
2	27. > UNIT ≥ 18.	1., 1.2, . . . , 1.8, 2., 2.25, . . . , 3., 3.25, . . . , 4., 4.5, 5., 5.5, 6., 6.5, 7., 8., 1.
3	18. > UNIT≥ 12.	1., 1.25, . . . , 2., 2.5, 3., 3.5, 4., 4.5, 5., 6., 8., 1.
4	12. > UNIT≥ 9.	1., 1.5, 2., 2.5, 3., 3.5, 4., 5., 7., 1.
5	9. > UNIT≥ 6.	1., 1.5, 2., 3., 5., 7., 1.
6	6. > UNIT≥ 4.	1., 2., 4., 6., 1.
7	4. > UNIT≥ 2.5	1., 3., 1.
8	2.5> UNIT≥ 1.	1., 1.

For UNIT < 1. the following scales are plotted:

9	1 > UNIT≥ 1/2	$10^i, 10^{i+1}, 10^{i+2}, \ldots$	
10	1/2> UNIT≥ 1/3	$10^i, 10^{i+2}, 10^{i+4}, \ldots$	
.			
.			
.			
8+n	1/n > UNIT≥ 1/(N+1)	$10^i, 10^{i+n}, 10^{i+2n}, \ldots$	$(n \leq 6)$

K4 is an index which indicates the position of YMINL in the table of scales above.
Example: For NT = 5 and YMINL = 2. is K4 = 3, because 2. is the third number in the scale for NT = 5.

If an error is detected, message and core dump are printed on the 1443 printer. This arrives for incorrect input parameters (YMAXL > YMINL) or if JST=0 and UNIT < 1/7.

3.13 SCALG

Entry point with calling sequence:
CALL SCALG (SIZE, Y, N, K, YMINL, DY, NT, K4, UNIT, JST)

Subroutines called by SCALG:

FLD/FSTO FADD/FSUB FMPY FLN	IBM 1800 library
MXMNL	
DXLG	

Core locations used: 98 (62 hexadec.)

Description:

SCALG Subroutine SCALG searches the maximum and minimum value of N values contained in the array Y with step size K, increments them by 2^{-128} and calculates their logarithms (base 10). These results as well as SIZE and JST serve as input when subroutine DXLG is called. DXLG calculates the parameters DY, NT, K4 and UNIT and calculates the minimum and its logarithm and stores it in YMINL. Finally SCALG replaces the array Y by a new one which may be directly plotted. The following formula is used:

$$Y'(I) = \frac{\log(Y(I)) - YMINL}{DY}$$

There is no check for negative values in the array Y and no check if I exceeds the dimension of Y.

3.14 AXIS

Entry point with calling sequence:
CALL AXIS (X, Y, SIZE, THETA, EBC, NO, YMIN, DY1, DL, NEXP)

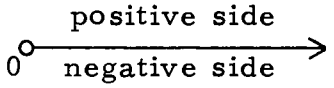
Subroutines called by axis:

FLD/FLDX/FSTO/FSTOX	
FADD/FADDX/FSUB	)
FMPY/FMPYX	)
FCOSN/FSIN	)
SNR	) IBM 1800
FDIV	) library
IFIX	)
FLOAT	)
FAXI	)
FABS	)
PLOT	
NUMBR	
SYMBL	

Core locations used: 464 (1D0 hexadec.)

Description:

AXIS Starting with the point (X, Y) subroutine AXIS designs a linear axis of the length SIZE in direction THETA (in degrees) to the positive X-direction. EBC determines the label of the axis, it is the lower address of an array containing NO characters in EBCDIC format. For negative NO label, tic marks and scale numbers are drawn on the negative side of the axis, otherwise on the positive side:



Parameters YMIN, DY1, DL and NEXP should be previously calculated by DXDY. YMIN is the functional value of the begin of the axis, DL means the length in cm between two tic marks, $DY1 * 10^{NEXP}$ is the functional increment between two tic marks.

3.15 AXLOG

Entry point with calling sequence:
CALL AXLOG (X, Y, SIZE, THETA, EBC, NO, YMINL, NT, K4, UNIT)

Subroutines called by AXLOG:

FLD/FLDX/FSTO/FSTOX	IBM 1800 library
FADD/FADDX/FSUB/FSBR	IBM 1800 library
FMPY/FMPYX	IBM 1800 library
FCOSN/FSIN	IBM 1800 library
SNR	IBM 1800 library
IFIX	IBM 1800 library
FLOAT	IBM 1800 library
FXPN	IBM 1800 library
FDIV	IBM 1800 library
FLN	IBM 1800 library
PLOT	
TABLG	
NUMBR	
SYMBL	

Core locations used: 566 (236 hexadec.)

Description:

AXLOG Starting with the point (X, Y) subroutine AXLOG designs a logarithmic axis of the length SIZE in direction THETA (in degrees) to the positive X-direction. EBC determines the label of the axis, it is the lower address of an array containing NO characters in EBCDIC format. If NO is positive, label, tic marks and scale numbers are drawn on the positive side of the axis, otherwise on the negative side. Parameters YMINL, NT, K4 and UNIT should be determined previously by DXLG. YMINL is the logarithm of the functional value of the begin of the axis, UNIT means the length in cm for 1 decade, NT determines the type of the scale and K4 the position of YMINL in the table for the scale (see subroutine DXLG).

3.16 LINE

Entry points with calling sequences:
CALL LINE (X, Y, N, NX, NY)
CALL DASH (X, Y, N, NX, NY)

Subroutine called by LINE: PLOT/PLTIR

Core locations used: 72 (48 hexadec.)

Description:

The arrays X and Y contain each N values with step sizes NX and NY respectively. These N pairs of values are the coordinates of N points.

LINE Subroutine LINE draws a full line through these N points.

DASH Subroutine DASH draws a dashed line through these N points.

3.17 MARK

Entry point with calling sequence:
CALL MARK (X, Y, N, NX, NY, EBC)

Subroutine called by MARK: SYMBL

Core locations used: 58 (3A hexadec.)

Description:

MARK The arrays X and Y contain each N values with step sizes NX and NY and determine the coordinates of N points. Subroutine MARK designs at each point the character which is contained in EBC (left-hand side adjusted, EBCDIC format). The centered symbols are specially provided for this subroutine.

3.18 SCLIN

Entry points with calling sequences:
CALL SCLIN (X, Y, N, NX, NY, XMIN, DX, YMIN, DY)
CALL SCDAS (X, Y, N, NX, NY, XMIN, DX, YMIN, DY)

Subroutines called by SCLIN: FLD/FSTO, FSUB, FDIV (IBM 1800 library); PLOT/PLTIR

Core locations used: 108 (6C hexadec.)

Description:

The subroutine searches N pairs of values in the arrays X and Y with step sizes NX and NY and performs the transformation:

$$X1 = \frac{X-XMIN}{DX} \qquad \text{and}$$

$$Y1 = \frac{Y-YMIN}{DY}$$

The arrays X and Y are not affected by the execution of the subroutine.

SCLIN Subroutine SCLIN draws a full line through the points with the coordinates (X1, Y1).

SCDAS Subroutine SCDAS draws a dashed line through the points with the coordinates (X1, Y1).

XMIN and DX, YMIN and DY should be previously calculated by DXDY.

3.19 SCLIF

Entry points with calling sequences:

```
EXTERNAL CALCF
CALL SCLIF (X, Y, N, NX, NY, XMIN, DX, IFX, YMIN, DY, IFY, CALCF)
CALL SCDAF (X, Y, N, NX, NY, XMIN, DX, IFX, YMIN, DY, IFY, CALCF)
```

Subroutines called by SCLIF:

FLD/FSTO)
FSUB)IBM 1800 library
FDIV)

PLOT/PLTIR
CALCF

Core locations used: 174 (AE hexadec.)

Description:

For IFX = IFY = 0 SCLIF works as subroutine SCLIN. If one of these indicators is not zero the user has to provide a subroutine
SUBROUTINE CALCF (VALUE, NI, IF)
where VALUE is the calculated X or Y value
NI is an integer running from 1 to N and
IF has the value of IFX or IFY depending on whether \ ALUE is the calculated value of the X or Y coordinate.
The subroutine determines N pairs of values either from the array X with step size NX if IFX = 0, respectively Y with step size NY if IFY = 0, or by a user-written subroutine CALCF if IFX and/or IFY are not equal 0. Then the subroutine performs the transformation:

$$X1 = \frac{X-XMIN}{DX} \qquad \text{and}$$

$$Y1 = \frac{Y-YMIN}{DY}$$

The arrays X and Y are not changed by the execution of the subroutine.

SCLIF Subroutine SCLIF draws a full line through the N points (X1, Y1).

SCDAF Subroutine SCDAF draws a dashed line through the N points (X1, Y1).
XMIN, DX, YMIN and DY should be previously calculated by DXDY.

3.20 SCMRK

Entry point with calling sequence:
CALL SCMRK (X, Y, N, NX, NY, XMIN, DX, YMIN, DY, EBC)

Subroutines called by SCMRK: FLD/FSTO, FSUB, FDIV (IBM 1800 subroutines); SYMBL

Core locations used: 92 (5C hexadec.)

Description:

SCMRK The subroutine searches N pairs of values in the arrays X and Y with step sizes NX and NY and performs the transformation

$$X1 = \frac{X-XMIN}{DX} \quad \text{and}$$

$$Y1 = \frac{Y-YMIN}{DY}$$

The arrays X and Y are not affected by the execution of the subroutine.
Subroutine SCMRK marks each point (X1, Y1) by the character defined by EBC (left-hand adjusted, EBCDIC format). The centered symbols are specially provided for this subroutine.

XMIN, DX, YMIN and DY should be previously calculated by DXDY.

3.2.1 SCMRF

Entry point with calling sequence:

```
EXTERNAL CALCF
CALL SCMRF (X, Y, N, NX, NY, XMIN, DX, IFX, YMIN, DY, IFY, CALCF,
            EBC)
```

Subroutines called by SCMRF: FLD/FSTO, FSUB, FDIV (IBM 1800 library); SYMBL; CALCF

Core locations used: 154 (9A hexadec.)

Description:

SCMRF For IFX = IFY = 0 SCMRF has the same function as SCMRK. If one of these indicators is not zero the user has to provide a subroutine
SUBROUTINE CALCF (VALUE, NI, IF)
where VALUE is the calculated X or Y value,
NI is an integer running from 1 to N and
IF has the value of IFX or IFY depending on whether VALUE is the calculated X or Y coordinate. In this case X and/or Y are dummy parameters.
The subroutine determines N pairs of values either from the array X with step size NX if IFX = 0, respectively array Y with step size NY if IFY = 0, or by a user-written subroutine CALCF if IFX and/or IFY not equal 0. Then the subroutine performs the transformation:

$$X1 = \frac{X-XMIN}{DX}$$

$$Y1 = \frac{Y-YMIN}{DY}$$

The arrays X and Y are not affected by the execution of SCMRF. Subroutine SCMRF marks each point (X1, Y1) by the symbol defined in EBC (left-hand side adjusted, EBCDIC format). For parameters XMIN, DX, YMIN, DY see subroutine DXDY.

3.22 SCLLG

Entry points with calling sequences:
CALL SCLLG (X, Y, N, NX, NY, XMINL, DX, YMINL, DY)
CALL SCDLG (X, Y, N, NX, NY, XMINL, DX, YMINL, DY)

Subroutines called by SCLLG:

FLD/FSTO	)
FADD/FSUB	) IBM 1800
FDIV	) library
FMPY	)
FLN	)
PLOT/PLTIR	

Core locations used: 124 (7C hexadec.)

Description:

The subroutine searches N pairs of values from the arrays X and Y with step sizes NX and NY and performs the transformation

$$X1 = \frac{\log X - XMINL}{DX}$$

$$Y1 = \frac{\log Y - YMINL}{DY}$$

without changing the arrays X and Y.

SCLLG Subroutine SCLLG connects the N points (X1, Y1) by a full line.

SCDLG Subroutine SCDLG draws a dashed line through the N points (X1, Y1).

For parameters XMINL, DX, YMINL and DY see DXLG.

3.23 SCMLG

Entry point with calling sequence:
CALL SCMLG (X, Y, N, NX, NY, XMINL, DX, YMINL, DY, EBC)

Subroutines called by SCMLG:

FLD/FSTO FADD/FSUB FDIV FMPY FLN	IBM 1800 library
SYMBL	

Core locations used: 108 (6C hexadec.)

Description:

SCMLG The subroutine searches N pairs of values from the arrays X and Y with step sizes NX and NY and performs the transformation

$$X1 = \frac{\log X - XMINL}{DX}$$

$$Y1 = \frac{\log Y - YMINL}{DY}$$

without changing the arrays X and Y.
The subroutine marks the N points (X1, Y1) by the special symbol given in EBC (left-hand side adjusted, EBCDIC format). For parameters XMINL, DX, YMINL and DY see DXLG.

3.24 LINSC

Entry points with calling sequences:
CALL LINSC (X, Y, N, NX, NY, IX, XMIN, DX, IY, YMIN, DY)
CALL DASSC (X, Y, N, NX, NY, IX, XMIN, DX, IY, YMIN, DY)

Subroutines called by LINSC:

FLD/FSTO FADD/FSUB FDIV FMPY FLN	IBM 1800 library
PLOT/PLTIR	

Core locations used: 132 (84 hexadec.)

Description:

The subroutine searches N pairs of values from the array X and Y with step sizes NX and NY and performs the transformation

$$X1 = \frac{X-XMIN}{DX} \quad \text{for IX = 0 or } X1 = \frac{\log X-XMIN}{DX} \quad \text{for IX = 1}$$

$$Y1 = \frac{Y-YMIN}{DY} \quad \text{for IY = 0 or } Y1 = \frac{\log Y-YMIN}{DY} \quad \text{for IY = 1}$$

without changing the arrays X and Y.

LINSC Subroutine LINSC draws a full line through the N points (X1, Y1).

DASSC Subroutine DASSC draws a dashed line through the N points (X1, Y1).

This subroutine permits the plotting of linear, semi-logarithmic and logarithmic designs. Parameters XMIN, DX, YMIN and DY should be previously calculated by DXDY or DXLG.

3.25 LINSF

Entry points with calling sequences:

```
EXTERNAL CALCF
CALL LINSF (X, Y, N, NX, NY, IX, XMIN, DX, IFX, IY, YMIN, DY,
            IFY, CALCF)
CALL DASSF (X, Y, N, NX, NY, IX, XMIN, DX, IFX, IY, YMIN, DY,
            IFY, CALCF)
```

Subroutines called by LINSF:

FLD/FSTO FADD/FSUB FDIV FMPY FLN	IBM 1800 library
PLOT/PLTIR	
CALCF	

Core locations used: 202 (CA hexadec.)

Description:

The subroutine determines N pairs of values either from the array X with step size NX if IFX = 0, respectively array Y with step size NY if IFY = 0, or by a user-written subroutine CALCF if IFX and/or IFY not equal 0. Then the subroutine performs the transformation:

$$X1 = \frac{X-XMIN}{DX} \text{ for IX = 0 or } X1 = \frac{\log X-XMIN}{DX} \text{ for IX = 1}$$

$$Y1 = \frac{Y-YMIN}{DY} \text{ for IY = 0 or } Y1 = \frac{\log Y-YMIN}{DY} \text{ for IY = 1}$$

without changing the arrays X and Y.

LINSF Subroutine LINSF draws a full line through the N points (X1, Y1).

DASSF Subroutine DASSF draws a dashed line through the N points (X1, Y1).

For parameters XMIN, DX, YMIN and DY see DXDY and DXLG.

3.26 MRKSC

Entry point with calling sequence:
CALL MRKSC (X, Y, N, NX, NY, IX, XMIN, DX, IY, YMIN, DY, EBC)

Subroutine called by MRKSC:

FLD/FSTO FADD/FSUB FDIV FMPY FLN	IBM 1800 library
SYMBL	

Core locations used: 116 (74 hexadec.)

Description:

MRKSC The subroutine searches N pairs of values from the arrays X and Y with step sizes NX and NY and performs the transformation

$$X1 = \frac{X-XMIN}{DX} \quad \text{for IX} = 0 \quad \text{or} \quad X1 = \frac{\log X-XMIN}{DX} \quad \text{for IX} = 1$$

$$Y1 = \frac{Y-YMIN}{DY} \quad \text{for IY} = 0 \quad \text{or} \quad Y1 = \frac{\log Y-YMIN}{DY} \quad \text{for IY} = 1$$

without changing the arrays X and Y.
The subroutine marks the N points (X1, Y1) by the special symbol contained in EBC (left-hand side adjusted, EBCDIC format). Parameters XMIN, DX, YMIN and DY should be previously calculated by DXDY or DXLG.

3.27 MRKSF

Entry point with calling sequence:

```
EXTERNAL CALCF
CALL MRKSF (X, Y, N, NX, NY, IX, XMIN, DX, IFX, IY, YMIN, DY,
            IFY, CALCF, EBC)
```

Subroutines called by MRKSF:

FLD/FSTO FADD/FSUB FDIV FMPY FLN	IBM 1800 library
SYMBL	
CALCF	

Core locations used: 180 (B4 hexadec.)

Description:

MRKSF The subroutine determines N pairs of values either from the array X with step size NX if IFX = 0, respectively array Y with step size NY if IFY = 0, or by a user-written subroutine CALCF if IFX and/or IFY not 0.
Then the subroutine performs the transformation

$$X1 = \frac{X-XMIN}{DX} \text{ for IX = 0 or } X1 = \frac{\log X-XMIN}{DX} \text{ for IX = 1}$$

$$Y1 = \frac{Y-YMIN}{DY} \text{ for IY = 0 or } Y1 = \frac{\log Y-YMIN}{DY} \text{ for IY = 1}$$

without changing the arrays X and Y.
The subroutine marks the N points (X1, Y1) by a special symbol given in EBC (left-hand side adjusted, EBCDIC format). For parameters XMIN, DX, YMIN and DY see DXDY and DXLG.

3.28 DESSN

Entry point with calling sequence:
CALL DESSN (X, Y, N, NX, NY, M, MX, MY, SIZX, SIZY, EBCX, NOX, EBCY, NOY, NC)

Subroutines called by DESSN:

FLD/FSTO) IBM 1800 library
FSUB)

MXMN
DXDY
AXIS
SCLIN/SCDAS
SCMRK

Core locations used: 334 (14E hexadec.)

Description:

DESSN Subroutine DESSN produces a complete plot of M curves, each with N points, with a linear X-axis of the length SIZX and a linear Y-axis of the length SIZY. Both axis are starting at (0., 0.). The X-axis is labeled by NOX characters given in EBCX, the Y-axis by NOY characters given in EBCY. If the character count is negative tic marks, scale numbers and label are drawn on the negative side of the axis, otherwise on the positive side.
The coordinates of the M curves are found in the following way from the arrays X and Y:
The first curve is determined by the array X and Y with step sizes NX and NY. The start coordinates for the following curves are found by incrementing the start addresses (positions in the arrays) of the preceding curve by step sizes MX and MY.
The meaning of NC is the following:
NC = 0 indicates that the points are connected by full lines, NC = 1 indicates that the points are connected by dashed lines, and NC = -1 indicates that the points are marked by centered symbols, defined by the subroutine. The first curve is marked by +, the second by x, the third by ±, the fourth by □ and the fifth by ◇ . If there are more than 5 curves the symbols are repeated.
Furthermore if SIZY is negative the axis are not designed and the scaling constants of the preceding plot are utilized. This permits to design several curves with different parameters in one design.

It is important to note that the arrays X and Y are not affected by the execution of DESSN.

3.29 DESNF

Entry point with calling sequence:

```
EXTERNAL CALCF
CALL DESNF (X, Y, N, NX, NY, M, MX, MY, SIZX, SIZY, FIX, IFY,
            EBCX, NOX, EBCY, NOY, NC, CALCF)
```

Subroutines called by DESNF:

FLD/FSTO, FSUB) IBM 1800 library

MXMNF
DXDY
AXIS
SCLIF/SCDAF
SCMRF

Core locations used: 340 (154 hexadec.)

Description:

DESNF For IFX = IFY = 0 subroutine DESNF has the same function as DESSN.
If one of these indicators is unequal zero the user has to provide a subroutine
SUBROUTINE CALCF (VALUE NI, IF)
where VALUE is the calculated functional value,
NI is an integer running from 1 to N and
IF has the value of IFX or IFY depending on whether VALUE is the calculated value of the X or Y coordinate.
For M greater 1, MX and/or MY is added to IFX respectively IFY to define the second function for the second curve etc.
Attention must be paid that initial values in CALCF are not destroyed because the subroutine is entered twice for each coordinate - the first time for searching the maximum and minimum value, the second time at plotting time. VALUE must be a well-defined function of NI and IF.

Examples:

A:

The X-coordinates have the values 10., 11., 12., . . .
If there is no place to store these values the following user-written subroutine may be used:

```
SUBROUTINE CALCF (VALUE, NI, IF)
DATA X0/9./
VALUE = X0+FLOAT(NI)
RETURN
END
```

B:

The function Y = SIN(X) * EXP(X) is to be plotted.
The following statements fulfil the requirements:

main program

```
  EXTERNAL CALCF
  CALL  DESNF (0., 0., N, 0, 0, 1, 0, 0, SIZX, SIZY, 1, 2, EBCX,
                NOX, EBCY, NOY, 0, CALCF)
```

subroutine

```
  SUBROUTINE  CALCF (VALUE, NI, IF)
  COMMON DX
  X = FLOAT (NI-1) * DX
  GOTO (1, 3), IF
1 VALUE = X
2 RETURN
3 VALUE = SIN(X) * EXP(X)
  GOTO 2
  END
```

3.30 DESLG

Entry point with calling sequence:
CALL DESLG (X, Y, N, NX, NY, M, MX, MY, SIZX, SIZY, IX, IY, EBCX, NOX, EBCY, NOY, NC)

Subroutines called by DESLG:

FLD/FSTO, FSUB) IBM 1800 library

MXMN
MXMNL
DXDY
DXLG
AXIS
AXLOG
LINSC/DASSC
MRKSC

Core locations used: 414 (19E hexadec.)

Description:

DESLG For IX = IY = 0 subroutine DESLG has the same function as DESSN. If one or both indicators are equal 1 the corresponding axis is plotted with logarithmic scales. All other parameters are the same as in DESSN.

3.31 DESLF

Entry point with calling sequence:

```
EXTERNAL CALCF
CALL DESLF (X, Y, N, NX, NY, M, MX, MY, SIZX, SIZY, IX, IY,
            IFX, IFY, EBCX, NOX, EBCY, NOY, NC, CALCF)
```

Subroutines called by DESLG:

FLD/FSTO, FSUB — IBM 1800 library

MXMNF
MXMLF
DXDY
DXLG
AXIS
AXLOG
LINSF/DASSF
MRKSF

Core locations used: 426 (1A8 hexadec.)

Description:

DESLF For IX = IY = 0 subroutine DESLF has the same function as DESNF. If one or both indicators are equal 1 the corresponding axis is plotted with logarithmic scales. All other parameters are the same as in DESNF.

Acknowledgements

The author wants to thank Dr. H. Horstmann for his continuous interest in this work and the helpful discussions during the test period of the programs.
I am also obliged to Mr. H. Claessen, IBM Brussels, for the subroutine USER and for his support concerning system engineering problems, and to the operators Mr. Cervini and Mr. Meloni for their help at the IBM 1800 computer.

4. References

1) IBM Systems Reference Library, IBM 1130/1800 Plotter Subroutines, Form C26-3755-0

2) P. Moinil, J. Pire, Programmation relative au Calcomp, Report EUR 2280 f (1965)

3) Nederlandse Computer Maatschappij, Reference Manuel SCOOP Programming System for Digital Incremental Plotters (1963).

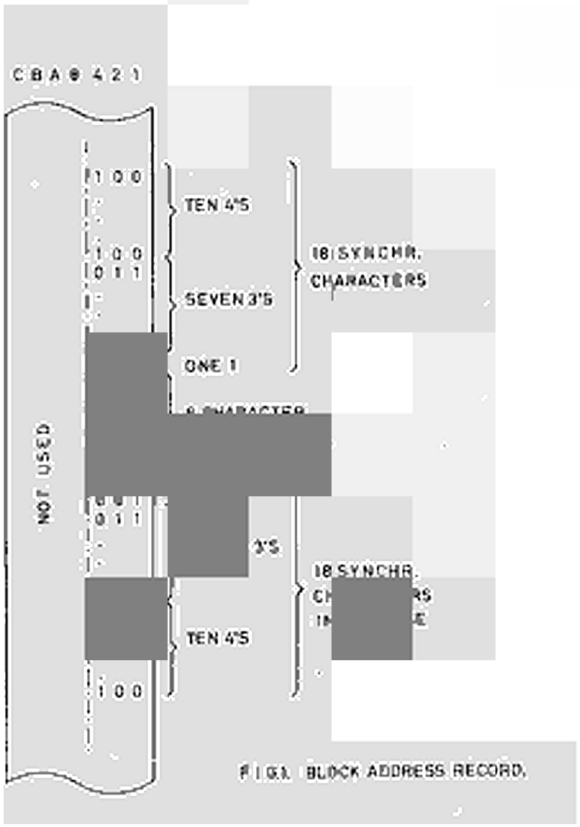


FIG. BLOCK ADDRESS RECORD.

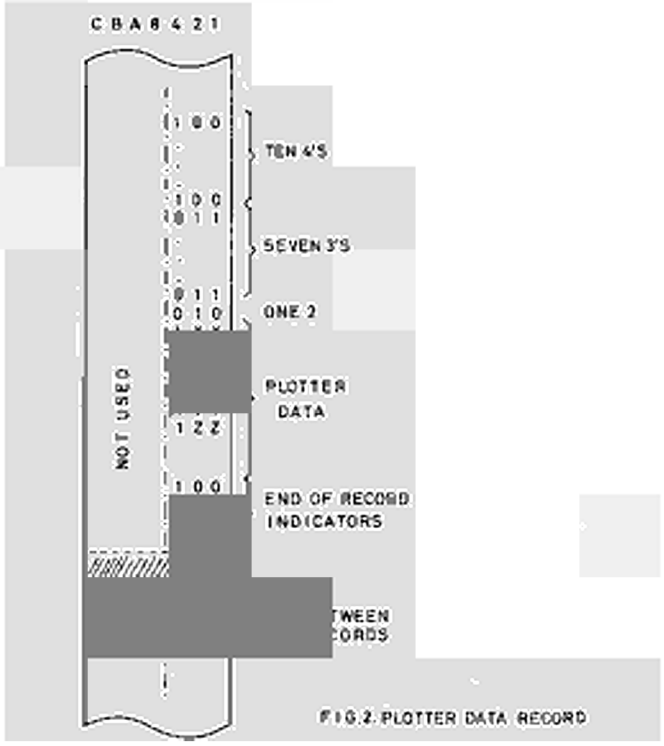


FIG.2. PLOTTER DATA RECORD

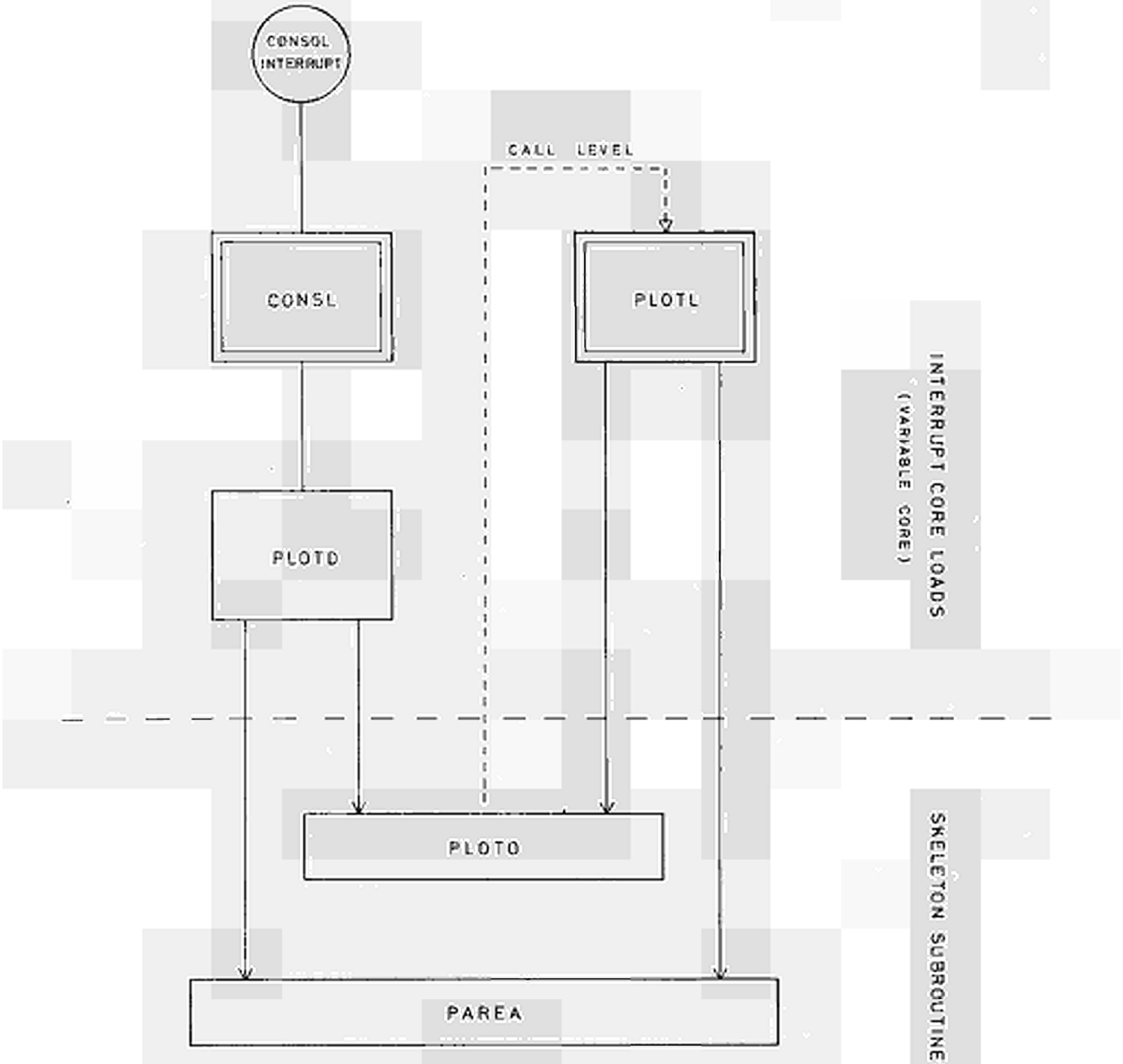


FIG.3. PROGRAM LINKAGE FOR PLOTTING IN TIME SHARING MODE

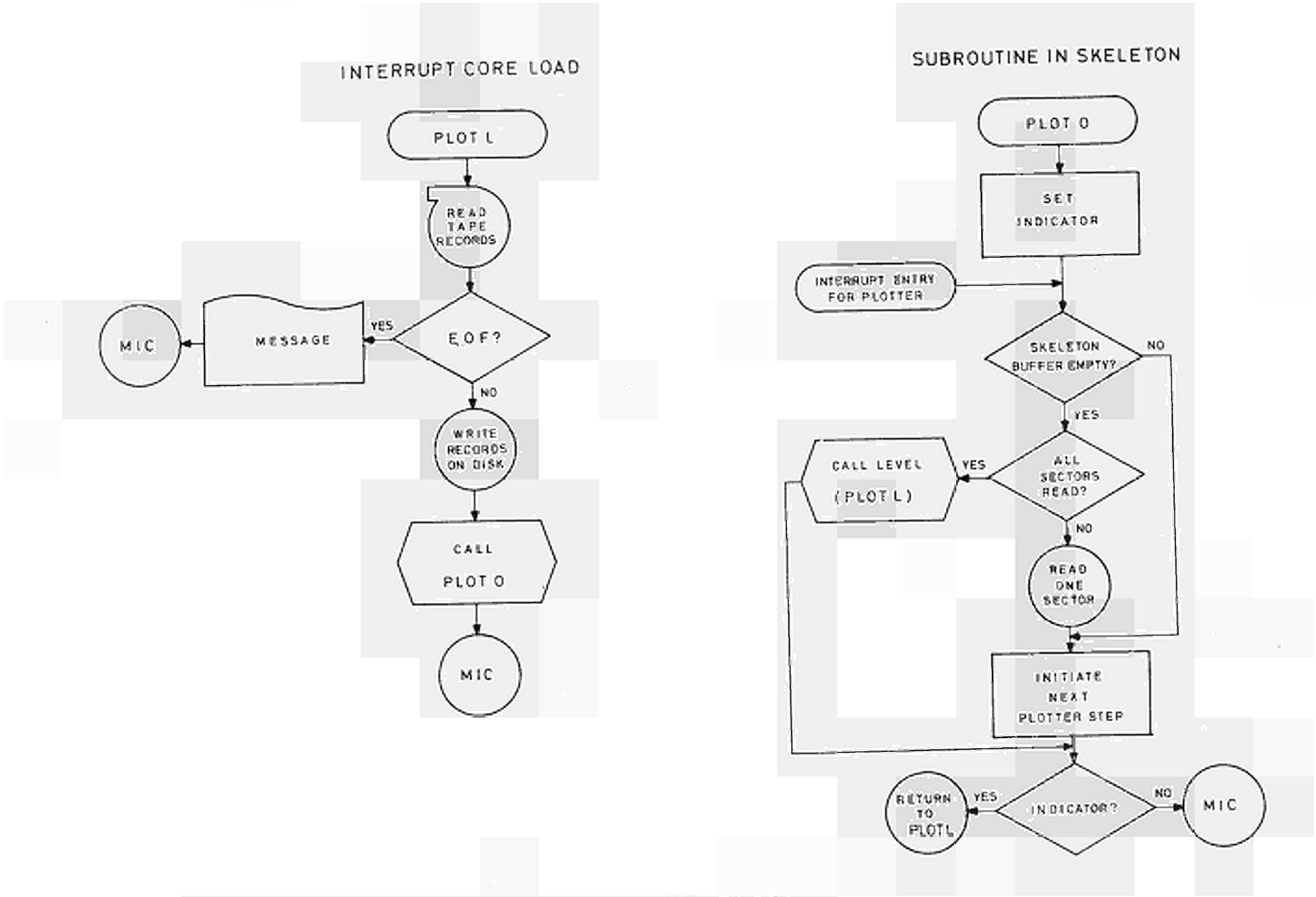


FIG.4. BLOCK DIAGRAMS OF PLOTO AND PLOTL

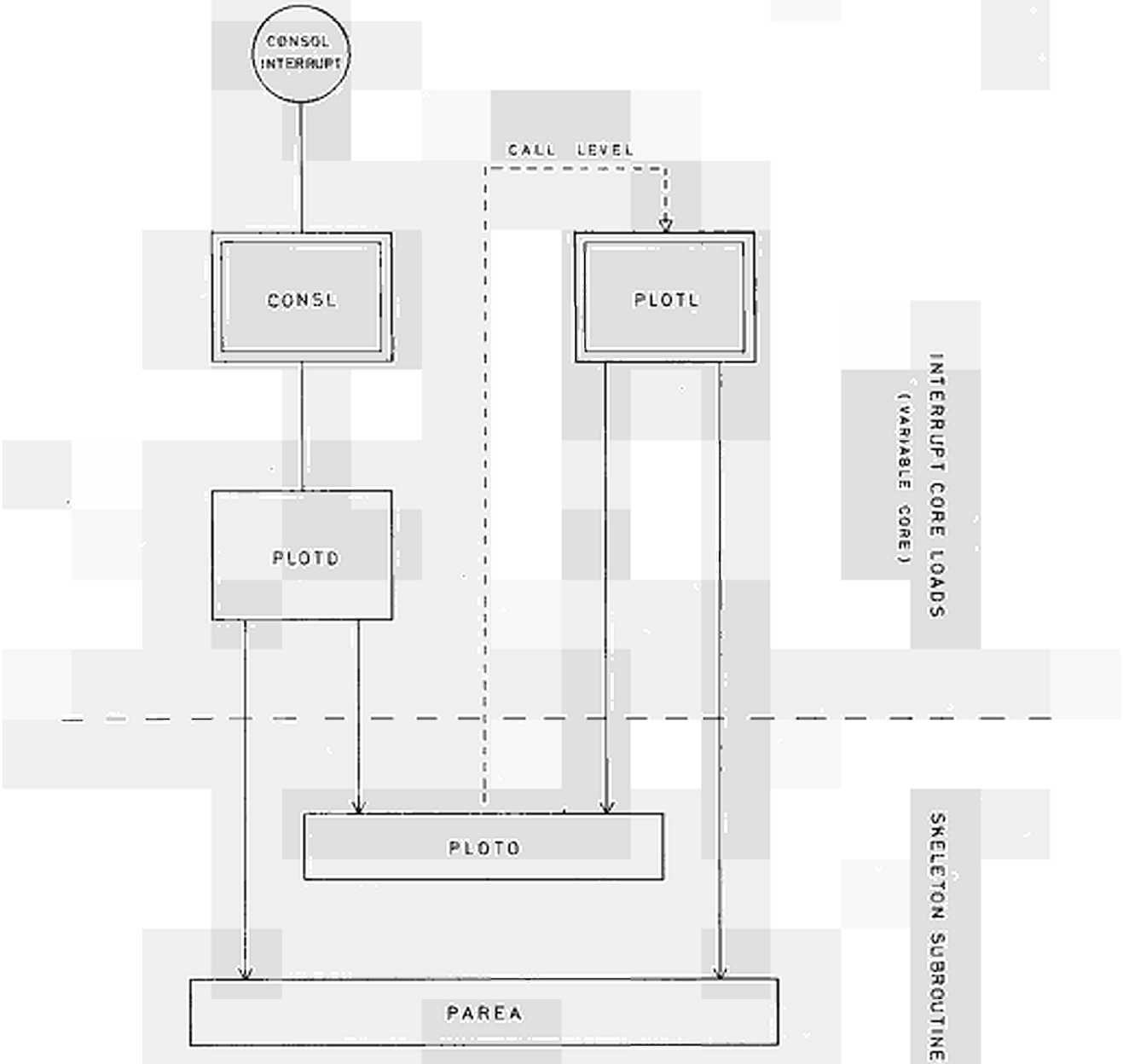


FIG.3. PROGRAM LINKAGE FOR PLOTTING IN TIME SHARING MODE

```
                        ************************************************** PLOT0002
                        *  IBM 1800 SUBROUTINES FOR CALCOMP 506/1800.    * PLOT0003
                        ************************************************** PLOT0004
                        *                                                * PLOT0005
                        *     SUBROUTINE PLOTO                           * PLOT0006
                        *                                                * PLOT0007
                        *     CALLING SEQUENCE                           * PLOT0008
                        *     ---------------                            * PLOT0009
                        *     CALL    PLOTO                              * PLOT0010
                        *                                                * PLOT0011
                        *  SUBROUTINE PLOTO MUST BE INCLUDED IN SKELETON. * PLOT0012
                        *  IT IS CALLED BY AN INTERRUPT CORE LOAD AND    * PLOT0013
                        *  OPERATES THE PLOTTER ON INTERRUPT BASIS ONLY.  * PLOT0014
                        *  PLOTA IS A SKELETON AREA IN WHICH THE PLOTTER  * PLOT0015
                        *  DATA ARE STORED. PLOTA AND SOME INDICATORS     * PLOT0016
                        *  ARE STORAGE PROTECTED.                         * PLOT0017
                        *                                                * PLOT0018
                        ************************************************** PLOT0019
0000     174D68D6       PLOTO ISS    1 PLOTO                              PLOT0020
0000 0   0005                  DC     5                                    PLOT0021
0001 1   000B                  DC     INTRT                                PLOT0022
0002                           ORG    *-2                                  PLOT0023
0000 0   0000          PLOTO   DC     0                                    PLOT0024
0001 0   691F                  STX    1 XR1+1                              PLOT0025
0002 0   6A20                  STX    2 XR2+1                              PLOT0026
0003 0   6B21                  STX    3 XR3+1                              PLOT0027
0004 01  6C0000E4              STX    L RETRN                              PLOT0028
0006 01  650000E5              LDX    L1 R                                 PLOT0029
0008 00  67800067              LDX    I3 TVLOC                             PLOT0030
000A 0   701D                  MDX    SCAN                                 PLOT0031
                        *                                                   PLOT0032
                        *     INTERRUPT ENTRY                               PLOT0033
                        *                                                   PLOT0034
000B 00  67800067      INTRT   LDX    I3 TVLOC                             PLOT0035
000D 01  650000E5              LDX    L1 R                                 PLOT0036
000F 0   09F9                  XIO    1 SEDSW-R                            PLOT0037
0010 00  4C90005A              BSC    I 90,-       TEST FALSE INTERRUPT    PLOT0038
0012 0   1001                  SLA    1                                    PLOT0039
0013 01  4C100028              BSC    L SCAN,-     TEST PARITY ERROR       PLOT0040
                        *                                                   PLOT0041
0015 20  23A17155      ERROR   LIBF   TYPEN                                PLOT0042
0016 0   2001                  DC     /2001                                PLOT0043
0017 1   00F5                  DC     MES1-1                               PLOT0044
0018 0   0000          ENDBF   DC     0                                    PLOT0045
0019 01  740000E4      END     MDX    L RETRN,0                            PLOT0046
001B 0   7002                  MDX    END1                                 PLOT0047
001C 00  4C80005A              BSC    I 90                                 PLOT0048
001E 0   1010          END1    SLA    16                                   PLOT0049
001F 0   D1FF                  STO    1 RETRN-R                            PLOT0050
0020 00  65000000      XR1     LDX    L1 *-*                               PLOT0051
0022 00  66000000      XR2     LDX    L2 *-*                               PLOT0052
0024 00  67000000      XR3     LDX    L3 *-*                               PLOT0053
                        *                                                   PLOT0054
0026 01  4C800000              BSC    I PLOTO      RETURN                  PLOT0055
                        *                                                   PLOT0056
0028 0   09FB          SCAN    XIO    1 SENSE-R    TEST BUSY               PLOT0057
0029 0   100F                  SLA    15           NOT READY ERROR         PLOT0058
```

```
002A 01 4C020019          BSC  L  END,C                                  PLOT0059
002C 01 4C280015          BSC  L  ERROR,+Z                               PLOT0060
                     *                                                   PLOT0061
002E 00 6600007F          LDX  L2 CON                                    PLOT0062
0030 0  0AB3              XIO   2 MK1-CON     MASK ALL LEVELS            PLOT0063
0031 0  0AB5              XIO   2 MK2-CON                                PLOT0064
0032 0  CAEF              LDD   2 SMASK-CON                              PLOT0065
0033 0  D9F5              STD   1 SAVMK-R                                PLOT0066
0034 0  C2AF              LD    2 UNMK1-CON                              PLOT0067
0035 0  D1F7              STO   1 CMASK-R                                PLOT0068
0036 0  C2B1              LD    2 UNMK2-CON                              PLOT0069
0037 0  D1F8              STO   1 CMASK-R+1                              PLOT0070
0038 0  C2B3              LD    2 MK1-CON                                PLOT0071
0039 0  D2AF              STO   2 UNMK1-CON                              PLOT0072
003A 0  D2EF              STO   2 SMASK-CON                              PLOT0073
003B 0  C2B5              LD    2 MK2-CON                                PLOT0074
003C 0  D2B1              STO   2 UNMK2-CON                              PLOT0075
003D 0  D2F0              STO   2 SMASK+1-CON                            PLOT0076
003E 01 2C40009C          STS  L  S6+1,/40    CLEAR STORAGE PROT. BIT    PLOT0077
0040 01 2C40009E          STS  L  S7+1,/40                               PLOT0078
0042 01 2C400018          STS  L  ENDBF,/40                              PLOT0079
0044 01 2C4000DE          STS  L  COUNT,/40                              PLOT0080
0046 01 2C400078          STS  L  LASTS,/40                              PLOT0081
0048 01 65800072          LDX  I1 S15+1                                  PLOT0082
004A 0  C102              LD    1 2                                      PLOT0083
004B 0  1002              SLA     2                                      PLOT0084
004C 01 4C280068          BSC  L  S06,+Z                                 PLOT0085
004E 01 650000E5          LDX  L1 R                                      PLOT0086
0050 0  09FF              XIO   1 SENSW-R                                PLOT0087
0051 0  1006              SLA     6                                      PLOT0088
0052 01 4C020057          BSC  L  S0,C                                   PLOT0089
0054 01 4C10005B          BSC  L  S02,-                                  PLOT0090
0056 0  705E              MDX     S12                                    PLOT0091
0057 0  1010         S0   SLA     16                                     PLOT0092
0058 0  D0BF              STO     ENDBF                                  PLOT0093
0059 0  D01E              STO     LASTS                                  PLOT0094
005A 0  705A              MDX     S12                                    PLOT0095
005B 01 74000018     S02  MDX  L  ENDBF,0     TEST IF NECESSARY TO READ  PLOT0096
005D 0  703D              MDX     S6          DISK - NO                  PLOT0097
005E 01 74000078          MDX  L  LASTS,0     TEST IF LAST SECTOR WAS    PLOT0098
0060 0  700D              MDX     S1          READ - NO                  PLOT0099
0061 0  6816         S05  STX     LASTS       YES                        PLOT0100
0062 0  1010              SLA     16                                     PLOT0101
0063 0  D0B4              STO     ENDBF                                  PLOT0102
0064 30 13165153          CALL    LEVEL                                  PLOT0103
0066 1  00F2              DC      K14                                    PLOT0104
0067 0  704D              MDX     S12                                    PLOT0105
0068 00 2D400002     S06  STS  L1 2,/40                                  PLOT0106
006A 0  D102              STO   1 2                                      PLOT0107
006B 01 650000E5          LDX  L1 R                                      PLOT0108
006D 0  70F3              MDX     S05                                    PLOT0109
                     *                                                   PLOT0110
006E 0  68A9         S1   STX     ENDBF                                  PLOT0111
006F 00 66000141          LDX  L2 321                                    PLOT0112
0071 30 17059141     S15  CALL    PAREA                                  PLOT0113
0073                      ORG     *-2                                    PLOT0114
0071 0  2E40              DC      /2E40       CLEAR STORAGE PROT. BIT    PLOT0115
```

```
0072     0001              BSS     1                                  PLOT0116
0073 0   72FF              MDX   2 -1                                 PLOT0117
0074 0   70FC              MDX     S15                                PLOT0118
0075 20  04262495          LIBF    DISKN       READ DISK              PLOT0119
0076 30  17059141          CALL    PAREA                              PLOT0120
0078                       ORG     *-2                                PLOT0121
0076 0   1000              DC      /1000                              PLOT0122
0077     0001              BSS     1                                  PLOT0123
0078 0   0000        LASTS DC      0                                  PLOT0124
0079 20  04262495    S2    LIBF    DISKN                              PLOT0125
007A 30  17059141          CALL    PAREA       TEST OP. COMPLETE      PLOT0126
007C                       ORG     *-2                                PLOT0127
007A 0   0100              DC      /0100                              PLOT0128
007B     0001              BSS     1                                  PLOT0129
007C 0   70FC              MDX     S2                                 PLOT0130
007D 01  65800072          LDX   I1 S15+1                             PLOT0131
007F 0   C101              LD    1 1           INCREMENT SECTOR ADDRESS PLOT0132
0080 0   806F              A       K1                                 PLOT0133
0081 0   D101              STO   1 1                                  PLOT0134
0082 00  66000141          LDX   L2 321                               PLOT0135
0084 30  17059141    S25   CALL    PAREA                              PLOT0136
0086                       ORG     *-2                                PLOT0137
0084 0   2E41              DC      /2E41       WRITE STORAGE PROT. BIT PLOT0138
0085     0001              BSS     1                                  PLOT0139
0086 0   72FF              MDX   2 -1                                 PLOT0140
0087 0   70FC              MDX     S25                                PLOT0141
0088 0   C102              LD    1 2                                  PLOT0142
0089 0   E06A              AND     XC000                              PLOT0143
008A 01  4C18008E          BSC   L S4,+-                              PLOT0144
008C 0   1010              SLA     16                                 PLOT0145
008D 0   D0EA              STO     LA$TS                              PLOT0146
                 *                                                    PLOT0147
008E 0   C102        S4    LD    1 2                                  PLOT0148
008F 0   1002              SLA     2                                  PLOT0149
0090 0   1802              SRA     2                                  PLOT0150
0091 01  650000E5          LDX   L1 R                                 PLOT0151
0093 01  4C080061          BSC   L  S05,+                             PLOT0152
0095 0   D1F9              STO   1 COUNT-R                            PLOT0153
0096 0   C0DB              LD      S15+1                              PLOT0154
0097 0   810C              A     1 K3-R                               PLOT0155
0098 0   D005              STO     S7+1                               PLOT0156
0099 0   6310              LDX   3 16                                 PLOT0157
009A 0   6B01              STX   3 *+1                                PLOT0158
009B 00  67000000    S6    LDX   L3 *-*                               PLOT0159
009D 00  C4000000    S7    LD    L  *-*                               PLOT0160
009F 0   73FC              MDX   3 -4                                 PLOT0161
00A0 0   1B00              SRA   3 0                                  PLOT0162
00A1 0   E10E              AND   1 MASK-R                             PLOT0163
00A2 01  4C080061          BSC   L  S05,+                             PLOT0164
00A4 0   D001              STO     *+1                                PLOT0165
00A5 00  C5000000          LD    L1 *-*                               PLOT0166
00A7 0   D1FB              STO   1 CHAR-R                             PLOT0167
00A8 0   09FD              XIO   1 WRITE-R                            PLOT0168
00A9 0   7300              MDX   3 0                                  PLOT0169
00AA 0   7009              MDX     S11                                PLOT0170
00AB 0   6310              LDX   3 16                                 PLOT0171
00AC 01  7401009E          MDX   L  S7+1,1                            PLOT0172
```

```
00AE 01 74FF00DE        MDX  L  COUNT,-1                                  PLOT0173
00B0 0  7003            MDX      S11                                      PLOT0174
00B1 0  1010            SLA      16                                       PLOT0175
00B2 01 D4000018        STO  L   ENDBF                                    PLOT0176
00B4 0  6BE7      S11   STX    3 S6+1                                     PLOT0177
00B5 01 2C410018  S12   STS  L   ENDBF,/41                                PLOT0178
00B7 01 2C4100DE        STS  L   COUNT,/41                                PLOT0179
00B9 01 2C410078        STS  L   LASTS,/41                                PLOT0180
00BB 01 2C41009C        STS  L   S6+1,/41                                 PLOT0181
00BD 01 2C41009E        STS  L   S7+1,/41                                 PLOT0182
00BF 00 6600007F        LDX  L2  CON                                      PLOT0183
00C1 01 740000E4        MDX  L   RETRN,0                                  PLOT0184
00C3 0  7003            MDX      MAINL                                    PLOT0185
00C4 0  4007            BSI      UNMSK                                    PLOT0186
                  *                                                       PLOT0187
00C5 00 4C80005A        BSC  I   90          EXIT ADDRESS OF I/O ROUT.  PLOT0188
                  *                                                       PLOT0189
00C7 0  1010      MAINL SLA      16                                       PLOT0190
00C8 0  D1FF            STO    1 RETRN-R                                  PLOT0191
00C9 0  4002            BSI      UNMSK                                    PLOT0192
00CA 01 4C000020        BSC  L   XR1                                      PLOT0193
                  *                                                       PLOT0194
00CC 0  0000      UNMSK DC       0                                        PLOT0195
00CD 0  C80C            LDD      SAVMK                                    PLOT0196
00CE 0  DAEF            STD    2 SMASK-CON                                PLOT0197
00CF 0  C00C            LD       CMASK                                    PLOT0198
00D0 0  D2AF            STO    2 UNMK1-CON                                PLOT0199
00D1 0  C00B            LD       CMASK+1                                  PLOT0200
00D2 0  D2B1            STO    2 UNMK2-CON                                PLOT0201
00D3 0  0AAF            XIO    2 UNMK1-CON                                PLOT0202
00D4 0  0AB1            XIO    2 UNMK2-CON                                PLOT0203
00D5 0  0A21            XIO    2 IMASK-CON                                PLOT0204
00D6 0  0A23            XIO    2 IMASK+2-CON                              PLOT0205
00D7 01 4C8000CC        BSC  I   UNMSK                                    PLOT0206
                  *                                                       PLOT0207
00DA 00 00000000  SAVMK DEC      0                                        PLOT0208
00DC 00 00000000  CMASK DEC      0                                        PLOT0209
00DE 0  0000      SEDSW DC       0          SENSE AND RESET               PLOT0210
00DF 0  2F01            DC       /2F01                                    PLOT0211
00E0 0  0000      SENSE DC       0          SENSE NO RESET                PLOT0212
00E1 0  2F00            DC       /2F00                                    PLOT0213
00E2 1  00E0      WRITE DC       CHAR                                     PLOT0214
00E3 0  2900            DC       /2900                                    PLOT0215
00E4 0  0000      SENSW DC       0                                        PLOT0216
00E5 0  0760            DC       /0760                                    PLOT0217
00DE              COUNT EQU      SEDSW                                    PLOT0218
00E0              CHAR  EQU      SENSE                                    PLOT0219
                  *                                                       PLOT0220
00E6 0  0800      TABLE DC       /0800      1 =    +Y                     PLOT0221
00E7 0  4800            DC       /4800      2 = +X+Y                      PLOT0222
00E8 0  4000            DC       /4000      3 = +X                        PLOT0223
00E9 0  5000            DC       /5000      4 = +X-Y                      PLOT0224
00EA 0  1000            DC       /1000      5 =    -Y                     PLOT0225
00EB 0  3000            DC       /3000      6 = -X-Y                      PLOT0226
00EC 0  2000            DC       /2000      7 = -X                        PLOT0227
00ED 0  2800            DC       /2800      8 = -X+Y                      PLOT0228
00EE 0  0400            DC       /0400      9 = PEN UP                    PLOT0229
```

```
00EF 0  8000            DC      /8000       A = PEN DOWN                PLOT0230
00E4            RETRN   EQU     SENSW                                   PLOT0231
00F0 0  0001    K1      DC      1                                       PLOT0232
00F1 0  0003    K3      DC      3                                       PLOT0233
00F2 0  000E    K14     DC      14                                      PLOT0234
00F3 0  000F    MASK    DC      /000F                                   PLOT0235
00F4 0  C000    XC000   DC      /C000                                   PLOT0236
00F5 0  0010            DC      MES2-MES1                               PLOT0237
00F6    0020    MES1    DMES    'RPLOTTER ERROR - STOP PLOTTING.'E      PLOT0238
0106    0000    MES2    BSS     0                                       PLOT0239
00E5            R       EQU     TABLE-1                                 PLOT0240
0032            MK1     EQU     50                                      PLOT0241
0034            MK2     EQU     52                                      PLOT0242
002E            UNMK1   EQU     46                                      PLOT0243
0030            UNMK2   EQU     48                                      PLOT0244
007F            CON     EQU     127                                     PLOT0245
0067            TVLOC   EQU     103                                     PLOT0246
006E            SMASK   EQU     110                                     PLOT0247
00A0            IMASK   EQU     160                                     PLOT0248
0106                    END                                             PLOT0249
```

NO ERRORS IN ABOVE ASSEMBLY.

PLOTO
DUP FUNCTION COMPLETED

```
                                ************************************************* PLOTD002
                                *                                               * PLOTD003
                                *  PLOTD IS CALLED BY PROGRAM CONSL, THE SERVICING* PLOTD004
                                *  PROGRAM FOR CONSOL INTERRUPT.  PLOTD READS THE * PLOTD005
                                *  SENSE SWITCHES, EXTRACTS THE TAPE NUMBER FROM  * PLOTD006
                                *  SSW 6 AND 7 AND STORES IT IN SKELETON. THAN IT * PLOTD007
                                *  CALLS PLOTO.                                 * PLOTD008
                                *                                               * PLOTD009
                                ************************************************* PLOTD010
0000     174D68C4               ENT     PLOTD                                    PLOTD011
0000 0   0000           PLOTD  DC      0                                         PLOTD012
0001 20  23A17155               LIBF    TYPEN                                    PLOTD013
0002 0   2001                   DC      /2001                                    PLOTD014
0003 1   002A                   DC      MES1-1                                   PLOTD015
0004 0   0000                   DC      0                                        PLOTD016
0005 20  17064885               LIBF    PAUSE                                    PLOTD017
0006 0   0000                   DC      0                                        PLOTD018
0007 01  C4800025               LD   I  PAREA+1                                  PLOTD019
0009 0   D001                   STO     *+1                                      PLOTD020
000A 00  65000000               LDX  L1 *-*                                      PLOTD021
000C 00  6600007F               LDX  L2 CON                                      PLOTD022
000E 0   0AB3                   XIO   2 MK1-CON                                  PLOTD023
000F 0   0AB5                   XIO   2 MK2-CON                                  PLOTD024
0010 0   0817                   XIO     SENSW                                    PLOTD025
0011 0   E014                   AND     MASK                                     PLOTD026
0012 0   1808                   SRA     8                                        PLOTD027
0013 00  2D40FFFF               STS  L1 -1,/40                                   PLOTD028
0015 0   D1FF                   STO   1 -1                                       PLOTD029
0016 00  2D41FFFF               STS  L1 -1,/41                                   PLOTD030
0018 0   0AAF                   XIO   2 UNMK1-CON                                PLOTD031
0019 0   0AB1                   XIO   2 UNMK2-CON                                PLOTD032
001A 20  23A17155               LIBF    TYPEN                                    PLOTD033
001B 0   2001                   DC      /2001                                    PLOTD034
001C 1   004C                   DC      MES3-1                                   PLOTD035
001D 0   0000                   DC      0                                        PLOTD036
001E 20  17064885               LIBF    PAUSE                                    PLOTD037
001F 0   0000                   DC      0                                        PLOTD038
0020 30  174D68D6               CALL    PLOTO                                    PLOTD039
0022 01  4C800000               BSC  I  PLOTD                                    PLOTD040
0024 30  17059141       PAREA   CALL    PAREA                                    PLOTD041
                        *                                                        PLOTD042
0026 0   0300           MASK   DC      /0300                                    PLOTD043
0028     0000                   BSS  E  0                                        PLOTD044
0028 0   0000           SENSW  DC      0                                        PLOTD045
0029 0   0760                   DC      /0760                                    PLOTD046
002A 0   0021                   DC      MES2-MES1                                PLOTD047
002B     0022           MES1   DMES     PLOT PROGRAM'RENTER MAG. TAPE NO. '      PLOTD048
003C     0020                   DMES    THROUGH SENSE SWITCHES - START.'E        PLOTD049
004C     0000           MES2   BSS     0                                        PLOTD050
004C 0   001C                   DC      MES4-MES3                                PLOTD051
004D     0020           MES3   DMES    'RPLACE SSW 4,5 AND 6 TO CONTROL '       PLOTD052
005D     0018                   DMES    PLOT OPERATION - START.'E                PLOTD053
0069     0000           MES4   BSS     0                                        PLOTD054
002E                    UNMK1  EQU     46                                       PLOTD055
0030                    UNMK2  EQU     48                                       PLOTD056
0032                    MK1    EQU     50                                       PLOTD057
0034                    MK2    EQU     52                                       PLOTD058
007F                    CON    EQU     127                                      PLOTD059
006A                           END                                              PLOTD060
```

NO ERRORS IN ABOVE ASSEMBLY.

```
                        ****************************************************  USER 002
                        *                                                  *  USER 003
                        *  SUBROUTINE USER                                 *  USER 004
                        *  ---------------                                 *  USER 005
                        *                                                  *  USER 006
                        *  CALLING SEQUENCE                                *  USER 007
                        *     CALL    USER                                 *  USER 008
                        *     DC      EOFSW                                *  USER 009
                        *  THIS SUBROUTINE IS TO BE USED AS SPECIAL        *  USER 010
                        *  CONDITION ROUTINE FOR THE READ FUNCTION WITH    *  USER 011
                        *  LIBF    MAGT. IT TESTS THE ACCUMULATOR AND SETS *  USER 012
                        *  THE FOLLOWING SWITCHES.                         *  USER 013
                        *  EOFSW DC        *-*                             *  USER 014
                        *  ERRSW DC        *-*                             *  USER 015
                        *  TOLSW DC        *-*                             *  USER 016
                        *  LNGTH DC        *-*                             *  USER 017
                        *  EOFSW IS SET NONZERO IF END-OF-FILE IS DETECTED *  USER 018
                        *  ERRSW IS SET NONZERO IF TAPE ERRORS WERE        *  USER 019
                        *        DETECTED.                                 *  USER 020
                        *  TOLSW IS SET NONZERO IF THE RECORD WAS TOO LONG *  USER 021
                        *        FOR THE BUFFER.                           *  USER 022
                        *  LNGTH GIVES THE CHANNEL WORD COUNT AT THE END   *  USER 023
                        *        OF THE OPERATION. THIS LNGTH MUST BE      *  USER 024
                        *        ADDED TO THE LENGTH IN THE I/O AREA TO    *  USER 025
                        *        OBTAIN THE REAL LENGTH OF THE RECORD.     *  USER 026
                        *                                                  *  USER 027
                        *              M. CLAESSENS, IBM BRUSSELS          *  USER 028
                        ****************************************************  USER 029
0000     24885640               ENT     USER                                USER 030
0000 0   0000           USER    DC      0                                   USER 031
0001 0   690F                   STX   1 SAV1&1                              USER 032
0002 01  65800000               LDX   I1 USER                               USER 033
0004 0   6901                   STX   1 *+1                                 USER 034
0005 00  65800000               LDX   I1 *-*                                USER 035
0007 0   901B                   S       K1          ACC#1                   USER 036
0008 01  4C180016               BSC   L  US1,&-     YES,BRANCH              USER 037
000A 0   9018                   S       K1          ACC#2                   USER 038
000B 01  4C180019               BSC   L  US2,&-     YES,BRANCH              USER 039
000D 0   9016                   S       K2          ACC#4                   USER 040
000E 01  4C180020               BSC   L  US4,&-     YES,BRANCH              USER 041
0010 00  65000000     SAV1      LDX   L1 *-*                                USER 042
0012 01  74010000               MDX   L  USER,1                             USER 043
0014 01  4C800000               BSC   I  USER                               USER 044
0016 0   C000           US1     LD      *                                   USER 045
0017 0   D100                   STO   1 0                                   USER 046
0018 0   70F7                   MDX     SAV1                                USER 047
0019 0   1090           US2     SLT     16                                  USER 048
001A 0   8008                   A       K1                                  USER 049
001B 01  4C08001E               BSC   L  *&1,&      TEST IF TOO  LONG       USER 050
001D 0   D102                   STO   1 2           YES                     USER 051
001E 0   D103                   STO   1 3           NO                      USER 052
001F 0   70F0                   MDX     SAV1                                USER 053
0020 0   C000           US4     LD      *                                   USER 054
0021 0   D101                   STO   1 1                                   USER 055
0022 0   70F6                   MDX     US2                                 USER 056
0023 0   0001           K1      DC      1                                   USER 057
0024 0   0002           K2      DC      2                                   USER 058
0026                            END                                         USER 059

    NO ERRORS IN ABOVE ASSEMBLY.
USER
DUP FUNCTION COMPLETED
```

```
                         ************************************************** CONSL002
                         *                                                * CONSL003
                         *     SENSE SWITCH 0-6 DETERMINE THE CALLED SUBR. * CONSL004
                         *                                                * CONSL005
                         ************************************************** CONSL006
0000 20 23A17155  START   LIBF    TYPEN                                     CONSL007
0001  0  2001             DC      /2001                                     CONSL008
0002  1  0011             DC      MES1-1                                    CONSL009
0003  0  0000             DC      0                                         CONSL010
0004  0  0809             XIO     SENSW       SENSE THE SENSE SWITCHES      CONSL011
0005  0  B00A             CMP     X0C00                                     CONSL012
0006  0  7004             MDX     A0                                        CONSL013
0007  0  7003             MDX     A0                                        CONSL014
0008 30 174D68C4           CALL    PLOTD                                     CONSL015
000A  0  7001             MDX     EXIT        BRANCH TO TAPE PROGRAM        CONSL016
000B  0  1000     A0      NOP                                               CONSL017
                         *                                                  CONSL018
                         *     THIS NOP OPERATION CAN BE SUBSTITUTED BY     CONSL019
                         *     OTHER COMPARE INSTRUCTIONS FOR OTHER FUNCT.  CONSL020
                         *     OF CONSOL INTERRUPT.                         CONSL021
                         *                                                  CONSL022
000C 30 09563167  EXIT    CALL    INTEX                                     CONSL023
000E      0000            BSS  E  0                                         CONSL024
000E  0   0000    SENSW   DC      0                                         CONSL025
000F  0   0760            DC      /0760                                     CONSL026
0010  0   0C00    X0C00   DC      /0C00                                     CONSL027
0011  0   0014            DC      MES2-MES1                                 CONSL028
0012      001D    MES1    DMES    'R'RCONSOL INTERRUPT - PROGRAM '          CONSL029
0020      000B            DMES    SELECTED = 'E                             CONSL030
0026      0000    MES2    BSS     0                                         CONSL031
0026      0000            END     START                                     CONSL032
```

NO ERRORS IN ABOVE ASSEMBLY.

CONSL
DUP FUNCTION COMPLETED

```
                        ************************************************** PLOTL002
                        *  IBM 1800 SUBROUTINES FOR CALCOMP 506/1800.    * PLOTL003
                        ************************************************** PLOTL004
                        *                                                * PLOTL005
                        *  PLOTL IS TO BE EXECUTED AS INTERRUPT CORE LOAD.* PLOTL006
                        *  PLOTL READS A NUMBER OF TAPE RECORDS AND STORES* PLOTL007
                        *  THEM ON DISK IN THE DATA FILE NAMED PLOTA.    * PLOTL008
                        *  THAN PLOTL CALLS THE SKELETON SUBROUTINE PLOTO * PLOTL009
                        *  WHICH STARTS THE PLOTTER.                     * PLOTL010
                        *                                                * PLOTL011
                        ************************************************** PLOTL012
0000 01 C480004F   START LD    I  PAREA+1     WAS IT END OF BLOCK         PLOTL013
0002 0  D001          STO       *+1                                      PLOTL014
0003 00 65000000   P15 LDX   L1 *-*                                      PLOTL015
0005 0  C102          LD     1  2                                        PLOTL016
0006 01 4C100017      BSC   L  P2,-                                      PLOTL017
0008 0  0837          XIO      SENSW       YES                           PLOTL018
0009 0  1004          SLA      4           STOP IF SSW 4 IS ON           PLOTL019
000A 01 4C100017      BSC   L  P2,-                                      PLOTL020
000C 01 440000A3      BSI   L  CLOCK                                     PLOTL021
000E 1  0212          DC       MES2-3                                    PLOTL022
000F 20 23A17155      LIBF     TYPEN                                     PLOTL023
0010 0  2001          DC       /2001                                     PLOTL024
0011 1  0200          DC       MES1-1                                    PLOTL025
0012 0  0000          DC       0                                         PLOTL026
0013 0  1010          SLA      16                                        PLOTL027
0014 0  D102          STO    1 2                                         PLOTL028
0015 01 4C000096      BSC   L  P12+2                                     PLOTL029
                      *                                                  PLOTL030
0017 0  C1FF          P2  LD     1 -1        SEARCH TAPE NUMBER          PLOTL031
0018 0  E841          OR       P5                                        PLOTL032
0019 0  D040          STO      P5                                        PLOTL033
001A 0  C1FF          LD     1 -1                                        PLOTL034
001B 0  E870          OR       P11                                       PLOTL035
001C 0  D06F          STO      P11                                       PLOTL036
001D 0  C1FF          LD     1 -1                                        PLOTL037
001E 0  1005          SLA      5                                         PLOTL038
001F 0  E823          OR       SEDSW+1                                   PLOTL039
0020 0  D022          STO      SEDSW+1                                   PLOTL040
                      *                                                  PLOTL041
0021 0  C023          LD       DSA+1                                     PLOTL042
0022 0  D027          STO      SECAD                                     PLOTL043
0023 00 6600007F      LDX   L2 CON                                       PLOTL044
0025 0  0AB3          XIO    2 MK1-CON                                   PLOTL045
0026 0  0AB5          XIO    2 MK2-CON                                   PLOTL046
0027 00 2D400001      STS   L1 1,/40                                     PLOTL047
0029 0  D101          STO    1 1                                         PLOTL048
002A 00 2D410001      STS   L1 1,/41                                     PLOTL049
002C 0  0AAF          XIO    2 UNMK1-CON                                 PLOTL050
002D 0  0AB1          XIO    2 UNMK2-CON                                 PLOTL051
                      *                                                  PLOTL052
002E 0  0813          XIO      SEDSW       SELECT TAPE                   PLOTL053
002F 01 66800044      LDX   I2 DSA         XR2 HAS SECTOR COUNT          PLOTL054
0031 0  0810          XIO      SEDSW       SENSE DSW OF TAPE UNIT        PLOTL055
0032 0  E019          AND      K3                                        PLOTL056
0033 01 4C180056      BSC   L  P3,+-                                     PLOTL057
0035 0  F016          EOR      K3                                        PLOTL058
0036 01 4C180056      BSC   L  P3,+-                                     PLOTL059
                      *                                                  PLOTL060
0038 0  406A          BSI      CLOCK       TAPE NOT READY                PLOTL061
0039 1  0227          DC       MES4-3                                    PLOTL062
```

```
003A 20 23A17155          LIBF     TYPEN                                  PLOTL063
003B  0  2001             DC       /2001                                  PLOTL064
003C  1  0215             DC       MES3-1                                 PLOTL065
003D  0  0000             DC       0                                      PLOTL066
003E  0  7055             MDX      P12                                    PLOTL067
                     *                                                    PLOTL068
                     *    CONSTANTS                                       PLOTL069
                     *                                                    PLOTL070
0040     0000             BSS  E   0                                      PLOTL071
0040  0  0000        SENSW DC       0                                      PLOTL072
0041  0  0760             DC       /0760                                  PLOTL073
0042  0  0000        SEDSW DC       0                                      PLOTL074
0043  0  7700             DC       /7700                                  PLOTL075
                     *                                                    PLOTL076
0044 31 174D68C1    DSA   DSA      PLOTA                                  PLOTL077
0047                      ORG      DSA+2                                  PLOTL078
                     *                                                    PLOTL079
0046  0  0000        EOFSW DC       0                                      PLOTL080
0047  0  0000        ERRSW DC       0                                      PLOTL081
0048  0  0000        TOLG  DC       0                                      PLOTL082
0049  0  0000        LNGTH DC       0                                      PLOTL083
004A  0  0000        SECAD DC       0                                      PLOTL084
004B  0  0000        IHOUR DC       0                                      PLOTL085
004C  0  0003        K3    DC       3                                      PLOTL086
004D  0  4000        X4000 DC       /4000                                  PLOTL087
                     *                                                    PLOTL088
004E 30 17059141    PAREA CALL     PAREA                                  PLOTL089
0050     0006       CDCOD BSS      6                                      PLOTL090
                     *                                                    PLOTL091
0056  0  6103        P3    LDX    1 3          XR1 HAS ERROR RETRIES      PLOTL092
0057  0  C066              LD       K320                                   PLOTL093
0058  0  D066              STO      AREA                                   PLOTL094
0059 20 140478C0    P4    LIBF     MAGT                                   PLOTL095
005A  0  2000       P5    DC       /2000                                  PLOTL096
005B  1  00BF             DC       AREA                                   PLOTL097
005C  1  00B7             DC       USER                                   PLOTL098
005D 20 140478C0          LIBF     MAGT                                   PLOTL099
005E  0  0000             DC       0                                      PLOTL100
005F  0  70FD             MDX      *-3                                    PLOTL101
0060 01 74000046          MDX    L EOFSW,0      TEST EOF                  PLOTL102
0062  0  702B             MDX      EOF                                    PLOTL103
0063 01 74000047          MDX    L ERRSW,0      TEST TAPE ERROR           PLOTL104
0065  0  701A             MDX      ERROR                                  PLOTL105
0066  0  72FF             MDX    2 -1           DECREMENT SECTOR COUNT    PLOTL106
0067  0  7003             MDX      P6                                     PLOTL107
0068  0  C057             LD       AREA+1       INSERT LAST SECTOR BIT    PLOTL108
0069  0  E8E3             OR       X4000                                  PLOTL109
006A  0  D055             STO      AREA+1                                 PLOTL110
006B  0  C0DE       P6    LD       SECAD                                  PLOTL111
006C  0  D052             STO      AREA                                   PLOTL112
006D 20 04262495          LIBF     DISKN        WRITE DISK                PLOTL113
006E  0  3000             DC       /3000                                  PLOTL114
006F  1  00BE             DC       AREA-1                                 PLOTL115
0070  0  0000             DC       0                                      PLOTL116
0071 01 7401004A          MDX    L SECAD,1                                PLOTL117
0073 20 04262495    P7    LIBF     DISKN                                  PLOTL118
0074  0  0100             DC       /0100                                  PLOTL119
0075  1  00BE             DC       AREA-1                                 PLOTL120
0076  0  70FC             MDX      P7                                     PLOTL121
0077  0  7200             MDX    2 0                                      PLOTL122
0078  0  7001             MDX      P75                                    PLOTL123
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```
0079 0  7003          MDX     P8                                          PLOTL124
007A 0  C045   P75     LD      AREA+1                                      PLOTL125
007B 01 4C100056       BSC  L  P3,-        BRANCH IF NOT END OF BLOCK      PLOTL126
               *                                                          PLOTL127
007D 30 174D68D6  P8   CALL    PLOTO                                       PLOTL128
               *                                                          PLOTL129
007F 0  7021           MDX     INTEX                                       PLOTL130
               *                                                          PLOTL131
0080 0  1010   ERROR  SLA     16                                          PLOTL132
0081 0  D0C5           STO     ERRSW                                       PLOTL133
0082 0  71FF           MDX  1  -1                                          PLOTL134
0083 0  7007           MDX     P10                                         PLOTL135
0084 0  401E           BSI     CLOCK                                       PLOTL136
0085 1  024B           DC      MES10-3                                     PLOTL137
0086 20 23A17155       LIBF    TYPEN                                       PLOTL138
0087 0  2001           DC      /2001                                       PLOTL139
0088 1  023F           DC      MES9-1                                      PLOTL140
0089 0  0000           DC      0                                           PLOTL141
008A 0  7009           MDX     P12                                         PLOTL142
008B 20 140478C0  P10  LIBF    MAGT                                        PLOTL143
008C 0  7000      P11  DC      /7000                                       PLOTL144
008D 0  70CB           MDX     P4                                          PLOTL145
               *                                                          PLOTL146
               *       END-OF-FILE ENCOUNTERED ON MAG. TAPE               PLOTL147
               *                                                          PLOTL148
008E 0  4014   EOF     BSI     CLOCK                                       PLOTL149
008F 1  023C           DC      MES8-3                                      PLOTL150
0090 20 23A17155       LIBF    TYPEN                                       PLOTL151
0091 0  2001           DC      /2001                                       PLOTL152
0092 1  022A           DC      MES7-1                                      PLOTL153
0093 0  0000           DC      0                                           PLOTL154
0094 01 65800004  P12  LDX  I1 P15+1                                       PLOTL155
0096 0  C026           LD      X2000                                       PLOTL156
               *                                                          PLOTL157
0097 0  627F           LDX     2 CON                                       PLOTL158
0098 0  0AB3           XIO     2 MK1-CON                                   PLOTL159
0099 0  0AB5           XIO     2 MK2-CON                                   PLOTL160
009A 00 2D400002       STS  L1 2,/40                                       PLOTL161
009C 0  D102           STO     1 2                                         PLOTL162
009D 00 2D410002       STS  L1 2,/41                                       PLOTL163
009F 0  0AAF           XIO     2 UNMK1-CON                                 PLOTL164
00A0 0  0AB1           XIO     2 UNMK2-CON                                 PLOTL165
               *                                                          PLOTL166
00A1 30 09563167  INTEX CALL    INTEX       RETURN TO MAINLINE              PLOTL167
               *                                                          PLOTL168
               *                                                          PLOTL169
00A3 0  0000   CLOCK   DC      0                                           PLOTL170
00A4 01 668000A3       LDX  I2 CLOCK                                       PLOTL171
00A6 0  C200           LD      2 0                                         PLOTL172
00A7 0  D009           STO     C                                           PLOTL173
00A8 30 034D60D2       CALL    CLOCK                                       PLOTL174
00AA 1  004B           DC      IHOUR                                       PLOTL175
00AB 0  C09F           LD      IHOUR                                       PLOTL176
00AC 20 02255103       LIBF    BINDC                                       PLOTL177
00AD 1  0050           DC      CDCOD                                       PLOTL178
00AE 20 085935D9       LIBF    HOLPR                                       PLOTL179
00AF 0  0000           DC      0                                           PLOTL180
00B0 1  0051           DC      CDCOD+1                                     PLOTL181
00B1 0  0000      C    DC      *-*                                         PLOTL182
00B2 0  0005           DC      5                                           PLOTL183
00B3 01 740100A3       MDX  L  CLOCK,1                                     PLOTL184
```

```
00B5 01 4C8000A3          BSC  I  CLOCK                                    PLOTL185
                          *                                                PLOTL186
00B7 0  0000              USER DC     0                                    PLOTL187
00B8 30 24885640          CALL    USER                                     PLOTL188
00BA 1  0046              DC      EOFSW                                    PLOTL189
00BB 01 4C8000B7          BSC  I  USER                                     PLOTL190
                          *                                                PLOTL191
00BD 0  2000              X2000 DC    /2000                                PLOTL192
00BE 0  0140              K320  DC    320                                  PLOTL193
00BF 0  0000              AREA  DC    0                                    PLOTL194
00C0    0140                    BSS   320                                  PLOTL195
                          *                                                PLOTL196
0200 0  0014                    DC    MES2-MES1                            PLOTL197
0201    0023              MES1  DMES  'REND OF BLOCK FOR PLOTTER - TIME = 'EPLOTL198
0215    0003              MES2  BES   3                                    PLOTL199
0215 0  0014                    DC    MES4-MES3                            PLOTL200
0216    0022              MES3  DMES  'RPLOTTER TAPE NOT READY - TIME = 'E PLOTL201
022A    0003              MES4  BES   3                                    PLOTL202
022A 0  0014                    DC    MES8-MES7                            PLOTL203
022B    0023              MES7  DMES  'REND OF FILE PLOTTER TAPE - TIME = 'EPLOTL204
023F    0003              MES8  BES   3                                    PLOTL205
023F 0  000E                    DC    MES10-MES9                           PLOTL206
0240    0016              MES9  DMES  'RTAPE ERROR - TIME = 'E             PLOTL207
024E    0003              MES10 BES   3                                    PLOTL208
0032                      MK1   EQU   50                                   PLOTL209
0034                      MK2   EQU   52                                   PLOTL210
002E                      UNMK1 EQU   46                                   PLOTL211
0030                      UNMK2 EQU   48                                   PLOTL212
007F                      CON   EQU   127                                  PLOTL213
024E    0000                    END   START                                PLOTL214

     NO ERRORS IN ABOVE ASSEMBLY.
PLOTL
DUP FUNCTION COMPLETED
```

```
                        ************************************************** EIFIX002
                        *  IBM 1800 SUBROUTINES FOR CALCOMP 506/570.     * EIFIX003
                        ************************************************** EIFIX004
                        *                                                * EIFIX005
                        *  SUBROUTINE EIFIX/EFLT                         * EIFIX006
                        *                                                * EIFIX007
                        *  CALLING SEQUENCE (ONLY ASSEMBLER)             * EIFIX008
                        *  ----------------                              * EIFIX009
                        *                                                * EIFIX010
                        *     LIBF    EIFIX       INPUT FLOATING POINT   * EIFIX011
                        *                           NUMBER IN FAC        * EIFIX012
                        *                         OUTPUT INTEGER IN A AND Q* EIFIX013
                        *                         BIT 12 OF XR3+55 IS SET* EIFIX014
                        *                         TO 1 IF RESULT EXCEEDS * EIFIX015
                        *                         THE MAX. OR MIN. VALUE.* EIFIX016
                        *     LIBF    EFLT        INPUT INTEGER IN A AND Q * EIFIX017
                        *                         OUTPUT FLOATING POINT  * EIFIX018
                        *                           NUMBER IN FAC        * EIFIX019
                        *                         THE SUBR. IS RE-ENRANT.* EIFIX020
                        *                                                * EIFIX021
                        ************************************************** EIFIX022
                              LIBR                                        EIFIX023
0000    05246267              ENT     EIFIX                               EIFIX024
002F    051938C0              ENT     EFLT                                EIFIX025
                        *                                                 EIFIX026
                        *     SUBROUTINE EIFIX                            EIFIX027
                        *                                                 EIFIX028
0000 0  0000          EIFIX DC      0                                     EIFIX029
0001 00 448000AC            BSI  I  TVSAV                                 EIFIX030
0003 0  C329                LD    3 41        SEARCH EXPONENT           EIFIX031
0004 0  9029                S       K128                                  EIFIX032
0005 01 4C30000B            BSC  L  E3,-Z                                 EIFIX033
0007 0  10A0                SLT     32        SET A AND Q IN LWA EQUAL  EIFIX034
0008 0  DB32          E2    STD   3 QZFIX+6   ZERO                      EIFIX035
0009 00 448000AD      EXIT  BSI  I  TVEXT                                 EIFIX036
000B 0  D332          E3    STO   3 QZFIX+6                               EIFIX037
000C 0  C020                LD      K31                                   EIFIX038
000D 0  9332                S     3 QZFIX+6                               EIFIX039
000E 01 4C28001A            BSC  L  E4,+Z                                 EIFIX040
0010 00 D4000036            STO  L  WK4                                   EIFIX041
0012 00 66800036            LDX  I2 WK4                                   EIFIX042
0014 0  CB2A                LDD   3 42        SEARCH MANTISSA IN FAC    EIFIX043
0015 0  1A80                SRT   2 0                                     EIFIX044
0016 01 4C100008            BSC  L  E2,-                                  EIFIX045
0018 0  880D                AD      D1                                    EIFIX046
0019 0  70EE                MDX     E2                                    EIFIX047
001A 0  C011          E4    LD      B12         ERROR                     EIFIX048
001B 0  EB37                OR    3 55                                    EIFIX049
001C 0  CB2A                LDD   3 42                                    EIFIX050
001D 01 4C100021            BSC  L  E5,-                                  EIFIX051
001F 0  C808                LDD     MIN                                   EIFIX052
0020 0  70E7                MDX     E2                                    EIFIX053
0021 0  C808          E5    LDD     MAX                                   EIFIX054
0022 0  70E5                MDX     E2                                    EIFIX055
                        *                                                 EIFIX056
                        *     CONSTANTS                                   EIFIX057
                        *                                                 EIFIX058
0024 00 00000000      D0    DEC     0                                     EIFIX059
0026 00 00000001      D1    DEC     1                                     EIFIX060
0028 0  8000          MIN   DC      /8000                                 EIFIX061
0029 0  0000                DC      0                                     EIFIX062
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002A 0  7FFF          MAX    DC       /7FFF                                  EIFIX063
002B 0  FFFF          XFFFF  DC       /FFFF                                  EIFIX064
002C 0  0008          B12    DC       /0008                                  EIFIX065
002D 0  001F          K31    DC       31                                     EIFIX066
002E 0  0080          K128   DC       128                                    EIFIX067
                      *                                                       EIFIX068
                      *      SUBROUTINE EFLT                                  EIFIX069
                      *                                                       EIFIX070
002F 0  0000          EFLT   DC       0                                      EIFIX071
0030 00 448000AC             BSI   I  TVSAV                                  EIFIX072
0032 0  6220                 LDX    2 32                                     EIFIX073
0033 0  CB32                 LDD    3 QZFIX+6     SEARCH INT. IN ACCUM. OF   EIFIX074
0034 0  B8EF                 DCM      D0          LEVEL WORK AREA            EIFIX075
0035 0  7002                 MDX      E6                                     EIFIX076
0036 0  7010                 MDX      E9                                     EIFIX077
0037 0  700C                 MDX      E8                                     EIFIX078
0038 0  12C0          E6     SLC    2 0                                      EIFIX079
0039 0  1881                 SRT      1                                      EIFIX080
003A 0  E0EF                 AND      MAX                                    EIFIX081
003B 00 76000080      E7     MDX   L2 128                                    EIFIX082
003D 0  DB2A          E75    STD    3 42          STORE MANTISSA IN FAC      EIFIX083
003E 00 6E000036             STX   L2 WK4                                    EIFIX084
0040 00 C4000036             LD    L  WK4                                    EIFIX085
0042 0  D329                 STO    3 41       STORE EXP. TO FAC            EIFIX086
0043 0  70C5                 MDX      EXIT                                   EIFIX087
0044 0  6200          E8     LDX    2 0                                      EIFIX088
0045 0  18A0                 SRT      32                                     EIFIX089
0046 0  70F6                 MDX      E75                                    EIFIX090
0047 0  F0E3          E9     EOR      XFFFF                                  EIFIX091
0048 0  D32A                 STO    3 42                                     EIFIX092
0049 0  1090                 SLT      16                                     EIFIX093
004A 0  F0E0                 EOR      XFFFF                                  EIFIX094
004B 0  1890                 SRT      16                                     EIFIX095
004C 0  C32A                 LD     3 42                                     EIFIX096
004D 0  88D8                 AD       D1                                     EIFIX097
004E 0  12C0                 SLC    2 0                                      EIFIX098
004F 0  1881                 SRT      1                                      EIFIX099
0050 0  E0D9                 AND      MAX                                    EIFIX100
0051 0  F0D9                 EOR      XFFFF                                  EIFIX101
0052 0  D32A                 STO    3 42                                     EIFIX102
0053 0  1090                 SLT      16                                     EIFIX103
0054 0  F0D6                 EOR      XFFFF                                  EIFIX104
0055 0  1890                 SRT      16                                     EIFIX105
0056 0  C32A                 LD     3 42                                     EIFIX106
0057 0  88CE                 AD       D1                                     EIFIX107
0058 0  70E2                 MDX      E7                                     EIFIX108
                      *                                                       EIFIX109
00AC                  TVSAV  EQU      172                                    EIFIX110
00AD                  TVEXT  EQU      173                                    EIFIX111
002C                  QZFIX  EQU      44                                     EIFIX112
0036                  WK4    EQU      54                                     EIFIX113
005A                         END                                            EIFIX114
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NO ERRORS IN ABOVE ASSEMBLY.
EIFIX EFLT
DUP FUNCTION COMPLETED

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                *****************************************************  PLOT1002
                *  IBM 1800 SUBROUTINES FOR CALCOMP 506/570.        *  PLOT1003
                *****************************************************  PLOT1004
                *                                                   *  PLOT1005
                *  CALLING SEQUENCE                                 *  PLOT1006
                *  ----------------                                 *  PLOT1007
                *  1.FORTRAN                                        *  PLOT1008
                *     CALL PLOT(X,Y,I)                              *  PLOT1009
                *     CALL PLTIR(X,Y,I)                             *  PLOT1010
                *     CALL FINIM(X,Y)                               *  PLOT1011
                *     CALL FINTR                                    *  PLOT1012
                *  2.ASSEMBLER                                      *  PLOT1013
                *     CALL     PLOT                                 *  PLOT1014
                *     DC       X          ABSCISSE                  *  PLOT1015
                *     DC       Y          ORDINATE                  *  PLOT1016
                *     DC       I          IND. FOR PEN UP OR DOWN   *  PLOT1017
                *     CALL     PLTIR                                *  PLOT1018
                *     DC       X                                    *  PLOT1019
                *     DC       Y                                    *  PLOT1020
                *     DC       I                                    *  PLOT1021
                *     CALL     FINIM                                *  PLOT1022
                *     DC       X                                    *  PLOT1023
                *     DC       Y                                    *  PLOT1024
                *     CALL     FINTR                                *  PLOT1025
                *                                                   *  PLOT1026
                *****************************************************  PLOT1027
001E    174D68C0        ENT      PLOT                                  PLOT1028
0000    174E3259        ENT      PLTIR                                 PLOT1029
0016    06255254        ENT      FINIM                                 PLOT1030
000F    062558D9        ENT      FINTR                                 PLOT1031
                *                                                      PLOT1032
0000 0  0000    PLTIR DC         0          ENTRY PLTIR                PLOT1033
0001 01 4400014F        BSI  L   SAVE                                  PLOT1034
0003 01 65800000        LDX  I1  PLTIR      SEARCH ADDRESS OF 1. PAR.  PLOT1035
0005 0  1010            SLA      16                                    PLOT1036
0006 0  D307            STO   3  IND2-R     IND2=0                     PLOT1037
0007 00 C5800002        LD    I1 2          SEARCH PARAMETER I         PLOT1038
0009 01 4C180023        BSC  L   A3,+-      TEST IF I=0                PLOT1039
000B 0  62E2            LDX   2  -30        NO                         PLOT1040
000C 01 6E0001B2        STX  L2  IND        IND=-30                    PLOT1041
000E 0  7014            MDX      A3                                    PLOT1042
                *                                                      PLOT1043
000F 0  0000    FINTR DC         0          ENTRY FINTR                PLOT1044
0010 01 4400014F        BSI  L   SAVE                                  PLOT1045
0012 0  1010            SLA      16                                    PLOT1046
0013 00 D7000009        STO  L3  IND4-R     IND4=0                     PLOT1047
0015 0  700D            MDX      A3                                    PLOT1048
                *                                                      PLOT1049
0016 0  0000    FINIM DC         0          ENTRY FINIM                PLOT1050
0017 01 4400014F        BSI  L   SAVE                                  PLOT1051
0019 01 65800016        LDX  I1  FINIM                                 PLOT1052
001B 0  1010            SLA      16                                    PLOT1053
001C 0  D308            STO   3  IND3-R     IND3=0                     PLOT1054
001D 0  7005            MDX      A3                                    PLOT1055
                *                                                      PLOT1056
001E 0  0000    PLOT  DC         0          ENTRY PLOT                 PLOT1057
001F 01 4400014F        BSI  L   SAVE                                  PLOT1058
0021 01 6580001E        LDX  I1  PLOT                                  PLOT1059
                *                                                      PLOT1060
0023 01 740001C1    A3  MDX  L   ACTPN,0    TEST IF NEW PLOT           PLOT1061
0025 0  707C            MDX      A15        NO                         PLOT1062
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0026 01 740001C2        MDX  L  BLNUM,0     YES, TEST IF FIRST PLOT     PLOT1063
0028 0  7022            MDX     A7          NO                          PLOT1064
0029 00 67800067        LDX  I3 TVLOC       YES                         PLOT1065
002B 20 03059115   A4   LIBF    CARDN       READ CONTROL CARD           PLOT1066
002C 0  1000            DC      /1000                                   PLOT1067
002D 1  01E7            DC      CARD                                    PLOT1068
002E 0  0000            DC      0                                       PLOT1069
002F 20 03059115   A5   LIBF    CARDN       TEST IF OPERATION COMPLETE  PLOT1070
0030 0  0000            DC      0                                       PLOT1071
0031 0  70FD            MDX     A5                                      PLOT1072
0032 01 670001AC        LDX  L3 R           XR3 HAS RELOCATION ADDRESS  PLOT1073
0034 0  C33C            LD    3 CARD+1-R                                PLOT1074
0035 0  933A            S     3 AST-R       TEST IF A CALCOMP CONTROL   PLOT1075
0036 01 4C180043        BSC  L  A6,+-       CARD                        PLOT1076
0038 00 67800067        LDX  I3 TVLOC       ERROR                       PLOT1077
003A 20 176558D5        LIBF    PRNTN                                   PLOT1078
003B 0  3F00            DC      /3F00                                   PLOT1079
003C 20 176558D5        LIBF    PRNTN                                   PLOT1080
003D 0  2100            DC      /2100       PRINT MESSAGE               PLOT1081
003E 1  0238            DC      MES1-1                                  PLOT1082
003F 0  0000            DC      0                                       PLOT1083
0040 20 17064885        LIBF    PAUSE       WAIT NUMBER 3               PLOT1084
0041 1  01D4            DC      K3                                      PLOT1085
0042 0  70E8            MDX     A4          BRANCH TO READ CONTROL      PLOT1086
0043 0  C33E       A6   LD    3 CARD+3-R    CARD DETERMINE UNIT NUMBER  PLOT1087
0044 0  6206            LDX   2 6                                       PLOT1088
0045 0  1240            SLCA  2 0                                       PLOT1089
0046 0  6A50            STX   2 A12                                     PLOT1090
0047 0  C329            LD    3 K4-R                                    PLOT1091
0048 0  904E            S       A12                                     PLOT1092
0049 0  EB1F            OR    3 MASKW-R                                 PLOT1093
004A 0  D04C            STO     A12                                     PLOT1094
                        *                                               PLOT1095
                        *       CONSTRUCT THE BLOCK ADDRESS             PLOT1096
                        *                                               PLOT1097
004B 01 740101C2   A7   MDX  L  BLNUM,1     INCREMENT BLOCK ADDRESS     PLOT1098
004D 0  C319            LD    3 X0301-R                                 PLOT1099
004E 0  D339            STO   3 AREA+9-R                                PLOT1100
004F 0  6203            LDX   2 3           XR2=3                       PLOT1101
0050 0  1090            SLT     16          CLEAR Q-REGISTER            PLOT1102
0051 0  C316            LD    3 BLNUM-R     LOAD BLOCKADDRESS IN ACCUM  PLOT1103
0052 0  1890       A8   SRT     16                                      PLOT1104
0053 0  AB2A            D     3 K10-R       DIVIDE BY 10                PLOT1105
0054 0  D30B            STO   3 SAVEA-R     SAVE QUOTIENT               PLOT1106
0055 0  108E            SLT     14          TREATE REMAINDER            PLOT1107
0056 0  1006            SLA     6                                       PLOT1108
0057 0  1082            SLT     2                                       PLOT1109
0058 0  EB31            OR    3 AREA+1-R                                PLOT1110
0059 01 D60001E5        STO  L2 AREA+9      PUT DECODED BLOCK ADDRESS   PLOT1111
005B 0  C30B            LD    3 SAVEA-R     IN OUTPUT AREA              PLOT1112
005C 0  72FF            MDX   2 -1          XR2=XR2-1                   PLOT1113
005D 0  70F4            MDX     A8                                      PLOT1114
005E 0  C31A            LD    3 X0103-R                                 PLOT1115
005F 0  D33D            STO   3 AREA+13-R                               PLOT1116
0060 0  CB36            LDD   3 AREA+6-R    INSERT CONSTANTS 0303       PLOT1117
0061 0  DB3E            STD   3 AREA+14-R                               PLOT1118
0062 0  D340            STO   3 AREA+16-R                               PLOT1119
0063 0  CB32            LDD   3 AREA+2-R                                PLOT1120
0064 0  D341            STO   3 AREA+17-R                               PLOT1121
0065 0  62E2            LDX   2 -30         XR2=-30                     PLOT1122
0066 01 DE00020C   A9   STD  L2 AREA+48     INSERT CONSTANTS 0404       PLOT1123
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0068 0  7202              MDX   2 2          XR2=XR2-2                  PLOT1124
0069 0  70FC              MDX     A9                                     PLOT1125
006A 0  622F              LDX   2 47         XR2=47                     PLOT1126
006B 01 6C0001B6          STX   L INDW                                  PLOT1127
006D 0  400D              BSI     A10        BRANCH TO OUTPUT           PLOT1128
006E 01 740101E5          MDX   L AREA+9,1                              PLOT1129
0070 01 6E0000FD          STX   L2 COUNT+1                              PLOT1130
0072 01 740001B5          MDX   L IND4,0     WAS ENTRY POINT FINTR      PLOT1131
0074 0  702D              MDX     A15        NO                         PLOT1132
0075 01 6C0001B5          STX   L IND4       YES                        PLOT1133
0077 01 44000157          BSI   L RSTOR      RESTORE INDEX REGISTERS    PLOT1134
0079 01 4C80000F          BSC   I FINTR      RETURN                     PLOT1135
                     *                                                  PLOT1136
                     *    SUBROUTINE FOR WRITING CALCOMP BUFFER ON TAPE PLOT1137
                     *                                                  PLOT1138
007B 0  0000         A10  DC      0                                     PLOT1139
007C 01 740001B6          MDX   L IND W,0    TEST INDW                  PLOT1140
007E 0  700C              MDX     A11                                    PLOT1141
007F 01 6C0001B6          STX   L INDW                                  PLOT1142
0081 0  C31B              LD    3 X0606-R                               PLOT1143
0082 0  1888              SRT     8                                     PLOT1144
0083 01 EE0001DD          OR    L2 AREA+1                               PLOT1145
0085 01 D60001DD          STO   L2 AREA+1                               PLOT1146
0087 0  1088              SLT     8                                     PLOT1147
0088 0  7202              MDX   2 2                                     PLOT1148
0089 01 D60001DC          STO   L2 AREA                                 PLOT1149
008B 0  CB2E         A11  LDD   3 END-R                                 PLOT1150
008C 01 D60001DD          STO   L2 AREA+1                               PLOT1151
008E 0  1090              SLT     16                                    PLOT1152
008F 01 D60001DE          STO   L2 AREA+2                               PLOT1153
0091 0  7202              MDX   2 2                                     PLOT1154
0092 01 6E0001DC          STX   L2 AREA                                 PLOT1155
0094 00 67800067          LDX   I3 TVLOC     TRANSFER VECTOR LOCATION   PLOT1156
0096 20 140478C0          LIBF    MAGT       WRITE TAPE                 PLOT1157
0097 0  0000         A12  DC      *-*                                   PLOT1158
0098 1  01DC              DC      AREA                                  PLOT1159
0099 1  0160              DC      USER       USER SUBROUTINE            PLOT1160
009A 0  6209              LDX   2 9          XR2=9                      PLOT1161
009B 20 140478C0     A13  LIBF    MAGT       TEST IF OP. COMPLETE       PLOT1162
009C 0  0000              DC      0                                     PLOT1163
009D 0  70FD              MDX     A13                                   PLOT1164
009E 01 670001AC          LDX   L3 R          XR3 HAS RELOCATION CONST.  PLOT1165
00A0 01 4C80007B          BSC   I A10                                   PLOT1166
                     *                                                  PLOT1167
                     *    END OF WRITING CALCOMP BUFFER ON TAPE         PLOT1168
                     *                                                  PLOT1169
00A2 00 C5800002     A15  LD    I1 2          LOAD PARAMETER I           PLOT1170
00A4 01 740001B4          MDX   L IND3,0     WAS ENTRY POINT FINIM      PLOT1171
00A6 0  7001              MDX     A16        NO                         PLOT1172
00A7 0  C328              LD    3 K3-R                                  PLOT1173
00A8 01 668000FD     A16  LDX   I2 COUNT+1                              PLOT1174
00AA 0  B315              CMP   3 ACTPN-R                               PLOT1175
00AB 0  7000              MDX     *                                     PLOT1176
00AC 0  43B7              BSI   3 PEN-R      PEN MOTION                 PLOT1177
00AD 0  6A4F              STX   2 COUNT+1                               PLOT1178
00AE 0  62FE              LDX   2 -2         XR2=-2                     PLOT1179
00AF 00 CD800000     A17  LDD   I1 0                                    PLOT1180
00B1 0  DB00              STD   3 X-R                                   PLOT1181
00B2 00 67800067          LDX   I3 TVLOC                                PLOT1182
00B4 20 064C4000          LIBF    FLD                                   PLOT1183
00B5 1  01AC              DC      X          XT=INT(100*X)              PLOT1184
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00B6 20 06517A00          LIBF   FMPY                                    PLOT1185
00B7 1  01B0              DC     D200P                                   PLOT1186
00B8 20 05246267          LIBF   EIFIX      YT=INT(100*Y)                PLOT1187
00B9 01 670001AC          LDX    L3 R                                    PLOT1188
00BB 0  8B02              AD      3 D1-R                                 PLOT1189
00BC 0  108F              SLT     15                                     PLOT1190
00BD 01 D60001BD          STO    L2 XT+2                                 PLOT1191
00BF 01 960001C5          S      L2 PENX+2                               PLOT1192
00C1 01 D60001BF          STO    L2 DX+2      DX=XT-PENX                 PLOT1193
00C3 01 4C1000C7          BSC    L  A18,-     ABSDX=/XT-PENX/            PLOT1194
00C5 0  A326              M       3 KM1-R                                PLOT1195
00C6 0  1090              SLT     16           DY=YT-PENY                 PLOT1196
00C7 01 D60001C1    A18   STO    L2 ABSDX+2   ABSDY=/YT-PENY/            PLOT1197
00C9 01 C60001BD          LD     L2 XT+2      PENX=XT                    PLOT1198
00CB 01 D60001C5          STO    L2 PENX+2    PENY=YT                    PLOT1199
00CD 0  7101              MDX     1 1         XR1=XR1+1                  PLOT1200
00CE 0  7201              MDX     2 1         XR2=XR2+1                  PLOT1201
00CF 0  70DF              MDX       A17       BRANCH IF XR2 NOT ZERO     PLOT1202
                    *                                                    PLOT1203
00D0 01 6D00001E          STX    L1 RETRN     SAVE RETURN ADDRESS        PLOT1204
00D2 0  62FE              LDX     2 -2        XR2=-2                     PLOT1205
00D3 0  1010              SLA     16                                     PLOT1206
00D4 0  D30C              STO     3 XYPLC-R   XYPLC=0                    PLOT1207
00D5 01 C60001BF    A20   LD     L2 DX+2      DETERMINE CONSTANTS OF     PLOT1208
00D7 01 4C2800DC          BSC    L  A21,+Z    MOTIONS                    PLOT1209
00D9 01 C60001CE          LD     L2 PXC+2     DX=POS.                    PLOT1210
00DB 0  7002              MDX       A22                                  PLOT1211
00DC 01 C60001D0    A21   LD     L2 MXC+2     DX=NEG.                    PLOT1212
00DE 01 D60001AE    A22   STO    L2 XPLTC+2                              PLOT1213
00E0 01 E60001CB          AND    L2 MASK+2                               PLOT1214
00E2 0  EB0C              OR      3 XYPLC-R   SET UP DIAGONAL COMMAND    PLOT1215
00E3 0  D30C              STO     3 XYPLC-R                              PLOT1216
00E4 0  7201              MDX     2 1         XR2=XR2+1                  PLOT1217
00E5 0  70EF              MDX       A20                                  PLOT1218
                    *                                                    PLOT1219
00E6 0  C313              LD      3 ABSDX-R                              PLOT1220
00E7 0  B314              CMP     3 ABSDY-R                              PLOT1221
00E8 0  700A              MDX       A24                                  PLOT1222
00E9 0  7001              MDX       A23                                  PLOT1223
00EA 0  7008              MDX       A24                                  PLOT1224
00EB 0  1890        A23   SRT     16           INTERCHANGE THE ROLES FOR  PLOT1225
00EC 0  C314              LD      3 ABSDY-R    /DX/ AND /DY/ FOR /DX/     PLOT1226
00ED 0  D313              STO     3 ABSDX-R    LARGER                     PLOT1227
00EE 0  1090              SLT     16                                     PLOT1228
00EF 0  D314              STO     3 ABSDY-R                              PLOT1229
00F0 0  C301              LD      3 YPLTC-R                              PLOT1230
00F1 0  D300              STO     3 XPLTC-R                              PLOT1231
00F2 0  C313              LD      3 ABSDX-R                              PLOT1232
00F3 0  D007        A24   STO       TEST&1     TEST=MAX(/DX/,/DY/)        PLOT1233
00F4 01 4C080139          BSC    L  A31,+     BRANCH IF TEST=0           PLOT1234
00F6 0  1801              SRA     1                                      PLOT1235
00F7 0  D30E              STO     3 ACCUM-R    ACCUM=MAX(/DX/,/DY/)/2     PLOT1236
00F8 0  C314              LD      3 ABSDY-R                              PLOT1237
00F9 0  D30D              STO     3 RATIO-R    RATIO=MIN(/DX/,/DY/)       PLOT1238
00FA 00 65000000    TEST  LDX    L1 *-*       XR1=MAX(/DX/,/DY/)         PLOT1239
00FC 00 66000000    COUNT LDX    L2 *-*       XR2=BUFFER COUNTER         PLOT1240
00FE 01 740001B3    A25   MDX    L  IND2,0    WAS ENTRY POINT PLTIR      PLOT1241
0100 0  700B              MDX       A27       NO                         PLOT1242
0101 01 740101B2          MDX    L  IND,1     YES, IND=IND+1             PLOT1243
0103 0  7008              MDX       A27                                  PLOT1244
0104 0  C327              LD      3 K2-R       CHANGE PEN POSITION        PLOT1245
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0105 0  B315          CMP   3 ACTPN-R                                  PLOT1246
0106 0  7002          MDX     A26                                       PLOT1247
0107 0  7001          MDX     A26                                       PLOT1248
0108 0  C328          LD    3 K3-R                                      PLOT1249
0109 0  43B7    A26   BSI   3 PEN-R       BRANCH TO SUBROUTINE PEN    PLOT1250
010A 0  C32B          LD    3 KM30-R                                    PLOT1251
010B 0  D306          STO   3 IND-R       IND=-30                     PLOT1252
010C 0  C31C    A27   LD    3 X0600-R                                   PLOT1253
010D 0  1890          SRT     16                                        PLOT1254
010E 0  C30E          LD    3 ACCUM-R                                   PLOT1255
010F 0  830D          A     3 RATIO-R                                   PLOT1256
0110 0  D30E          STO   3 ACCUM-R                                   PLOT1257
0111 0  90E9          S       TEST+1                                    PLOT1258
0112 01 4C280117      BSC   L A28,+Z                                    PLOT1259
0114 0  D30E          STO   3 ACCUM-R     ACCUM=ACCUM-RATIO           PLOT1260
0115 0  C30C          LD    3 XYPLC-R     DIAGONAL STEP               PLOT1261
0116 0  7001          MDX     *+1                                       PLOT1262
0117 0  C300    A28   LD    3 XPLTC-R     HORIZONTAL OR VERT. STEP    PLOT1263
0118 01 740001B6      MDX   L INDW,0      TEST INDW                   PLOT1264
011A 0  7013          MDX     A29         NOT ZERO                    PLOT1265
011B 01 6C0001B6      STX   L INDW        =0                          PLOT1266
011D 0  1888          SRT     8                                       PLOT1267
011E 0  7202          MDX   2 2           XR2=XR2+2                   PLOT1268
011F 01 EE0001DB      OR    L2 AREA-1                                   PLOT1269
0121 01 D60001DB      STO   L2 AREA-1                                   PLOT1270
0123 0  1090          SLT     16                                        PLOT1271
0124 01 D60001DC      STO   L2 AREA                                     PLOT1272
0126 0  6AD6          STX   2 COUNT+1     TEST IF BUFFER FULL         PLOT1273
0127 0  C0D5          LD      COUNT+1                                   PLOT1274
0128 0  B32C          CMP   3 KLNGT-R                                   PLOT1275
0129 0  7001          MDX     *+1                                       PLOT1276
012A 0  700B          MDX     A30                                       PLOT1277
012B 01 44000078      BSI   L A10         BRANCH TO OUTPUT            PLOT1278
012D 0  7008          MDX     A30                                       PLOT1279
012E 0  7201    A29   MDX   2 1           XR2=XR2+1                   PLOT1280
012F 01 D60001DC      STO   L2 AREA                                     PLOT1281
0131 0  1090          SLT     16                                        PLOT1282
0132 01 D60001DD      STO   L2 AREA+1                                   PLOT1283
0134 0  1010          SLA     16                                        PLOT1284
0135 0  D30A          STO   3 INDW-R      INDW=0                      PLOT1285
0136 0  71FF    A30   MDX   1 -1          XR1=XR1-1                   PLOT1286
0137 0  70C6          MDX     A25         BRANCH TO A25 IF NOT ZERO   PLOT1287
0138 0  6AC4          STX   2 COUNT+1     SAVE BUFFER COUNTER         PLOT1288
0139 01 740001B4    A31   MDX   L IND3,0   WAS ENTRY POINT FINIM       PLOT1289
013B 0  700D          MDX     A32         NO                          PLOT1290
013C 0  6877          STX     IND3        YES                         PLOT1291
013D 0  1010          SLA     16                                      PLOT1292
013E 0  D317          STO   3 PENX-R                                  PLOT1293
013F 0  D318          STO   3 PENY-R                                  PLOT1294
0140 0  D315          STO   3 ACTPN-R                                 PLOT1295
0141 0  61E2          LDX   1 -30                                     PLOT1296
0142 0  696F          STX   1 IND                                     PLOT1297
0143 01 668000FD      LDX   I2 COUNT+1    XR2 HAS BUFFER COUNTER      PLOT1298
0145 01 44000078      BSI   L A10         BRANCH TO OUTPUT            PLOT1299
0147 0  6AB5          STX   2 COUNT+1                                 PLOT1300
0148 0  7003          MDX     A33                                     PLOT1301
0149 0  6869    A32   STX     IND2                                    PLOT1302
014A 01 7401001E      MDX   L RETRN,1     INCREMENT RET. ADDR.        PLOT1303
014C 0  400A    A33   BSI     RSTOR       RESTORE INDEX REGISTERS     PLOT1304
014D 01 4C80001E      BSC   I RETRN                                    PLOT1305
                      *                                               PLOT1306
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                        *       SUBROUTINE TO SAVE THE INDEX REGISTERS          PLOT1307
                        *                                                       PLOT1308
014F 0  0000            SAVE    DC      0                                       PLOT1309
0150 0  6908                    STX     1 XR1+1                                 PLOT1310
0151 0  6A09                    STX     2 XR2+1                                 PLOT1311
0152 0  6B0A                    STX     3 XR3+1                                 PLOT1312
0153 01 670001AC                LDX   L3 R                                      PLOT1313
0155 01 4C80014F                BSC   I  SAVE                                   PLOT1314
                        *                                                       PLOT1315
                        *       SUBROUTINE TO RESTORE THE INDEX REGISTERS       PLOT1316
                        *                                                       PLOT1317
0157 0  0000            RSTOR   DC      0                                       PLOT1318
0158 00 65000000        XR1     LDX   L1 *-*                                    PLOT1319
015A 00 66000000        XR2     LDX   L2 *-*                                    PLOT1320
015C 00 67000000        XR3     LDX   L3 *-*                                    PLOT1321
015E 01 4C800157                BSC   I  RSTOR                                  PLOT1322
                        *                                                       PLOT1323
                        *       USER SUBROUTINE FOR MAG. TAPE                   PLOT1324
                        *                                                       PLOT1325
0160 0  0000            USER    DC      0                                       PLOT1326
0161 01 4C800160                BSC   I  USER                                   PLOT1327
                        *                                                       PLOT1328
                        *       SUBROUTINE TO CHANGE THE PEN POSITION           PLOT1329
                        *                                                       PLOT1330
0163 0  0000            PEN     DC      0                                       PLOT1331
0164 0  B327                    CMP     3 K2-R                                  PLOT1332
0165 0  7002                    MDX       PEN1                                  PLOT1333
0166 0  7001                    MDX       PEN1                                  PLOT1334
0167 0  7003                    MDX       PEN2                                  PLOT1335
0168 0  B328            PEN1    CMP     3 K3-R                                  PLOT1336
0169 0  703F                    MDX       PENEX       I NOT 2 OR 3, RETURN      PLOT1337
016A 0  703E                    MDX       PENEX                                 PLOT1338
016B 0  D315            PEN2    STO     3 ACTPN-R                               PLOT1339
016C 0  693B                    STX     1 PENX1+1                               PLOT1340
016D 01 740001B6                MDX   L  INDW,0      TEST INDW                 PLOT1341
016F 0  700B                    MDX       PEN3                                  PLOT1342
0170 0  6845                    STX       INDW                                  PLOT1343
0171 0  7202                    MDX     2 2                                     PLOT1344
0172 0  C31B                    LD      3 X0606-R                               PLOT1345
0173 0  1888                    SRT       8                                     PLOT1346
0174 01 EE0001DB                OR    L2 AREA-1                                 PLOT1347
0176 01 D60001DB                STO   L2 AREA-1                                 PLOT1348
0178 0  C31B                    LD      3 X0606-R                               PLOT1349
0179 01 D60001DC                STO   L2 AREA                                   PLOT1350
017B 01 6E0000FD        PEN3    STX   L2 COUNT+1                                PLOT1351
017D 01 C40000FD                LD    L  COUNT+1                                PLOT1352
017F 0  B32C                    CMP     3 KLNGT-R   TEST IF BUFFER FULL         PLOT1353
0180 0  7001                    MDX       *+1       YES                       PLOT1354
0181 0  7002                    MDX       PEN4      NO                        PLOT1355
0182 01 4400007B                BSI   L  A10         BRANCH TO OUTPUT          PLOT1356
0184 01 658001C1        PEN4    LDX   I1 ACTPN                                  PLOT1357
0186 01 C50001CE                LD    L1 X0706-2                                PLOT1358
0188 01 D60001DE                STO   L2 AREA+2                                 PLOT1359
018A 0  C31B                    LD      3 X0606-R                               PLOT1360
018B 01 D60001DD                STO   L2 AREA+1                                 PLOT1361
018D 01 D60001DF                STO   L2 AREA+3                                 PLOT1362
018F 0  7203                    MDX     2 3                                     PLOT1363
0190 0  61E1                    LDX     1 -31       XR1=-31                     PLOT1364
0191 01 6E0000FD        PEN5    STX   L2 COUNT+1                                PLOT1365
0193 01 C40000FD                LD    L  COUNT+1                                PLOT1366
0195 0  B32C                    CMP     3 KLNGT-R   TEST IF BUFFER FULL         PLOT1367
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0196 0  7001                MDX     *+1                                  PLOT1368
0197 0  7003                MDX     PEN6                                 PLOT1369
0198 01 44000078            BSI  L  A10          BRANCH TO OUTPUT        PLOT1370
019A 0  700C                MDX     PENX1                                PLOT1371
019B 0  7101          PEN6  MDX   1 1            XR1=XR1+1               PLOT1372
019C 0  7001                MDX     PEN7                                 PLOT1373
019D 0  7009                MDX     PENX1                                PLOT1374
019E 0  7203          PEN7  MDX   2 3                                    PLOT1375
019F 0  C31B                LD    3 X0606-R                              PLOT1376
01A0 01 D60001DA            STO  L2 AREA-2                               PLOT1377
01A2 01 D60001DB            STO  L2 AREA-1                               PLOT1378
01A4 01 D60001DC            STO  L2 AREA                                 PLOT1379
01A6 0  70EA                MDX     PEN5                                 PLOT1380
01A7 00 65000000      PENX1 LDX  L1 *-*                                  PLOT1381
01A9 01 4C800163      PENEX BSC  I  PEN                                  PLOT1382
                      *                                                  PLOT1383
                      *     CONSTANTS AND WORKAREAS                      PLOT1384
                      *                                                  PLOT1385
01AC 00 00000000      X     DEC     0                                    PLOT1386
01AE 00 00000001      D1    DEC     1                                    PLOT1387
01B0 00 64000088      D200P DEC     200.                                 PLOT1388
01B2 0  FFE2          IND   DC      -30                                  PLOT1389
01B3 0  FFFF          IND2  DC      /FFFF                                PLOT1390
01B4 0  FFFF          IND3  DC      /FFFF                                PLOT1391
01B5 0  FFFF          IND4  DC      /FFFF                                PLOT1392
01B6 0  FFFF          INDW  DC      /FFFF                                PLOT1393
01B7 0  0000          SAVEA DC      *-*                                  PLOT1394
01B8 0  0000          XYPLC DC      *-*                                  PLOT1395
01AC                  XPLTC EQU     X                                    PLOT1396
01AD                  YPLTC EQU     X+1                                  PLOT1397
01B9 0  0000          RATIO DC      *-*                                  PLOT1398
01BA 0  0000          ACCUM DC      *-*                                  PLOT1399
01BB 0  0000          XT    DC      *-*                                  PLOT1400
01BC 0  0000          YT    DC      *-*                                  PLOT1401
01BD 0  0000          DX    DC      *-*                                  PLOT1402
01BE 0  0000          DY    DC      *-*                                  PLOT1403
01BF 0  0000          ABSDX DC      *-*                                  PLOT1404
01C0 0  0000          ABSDY DC      *-*                                  PLOT1405
001E                  RETRN EQU     PLOT                                 PLOT1406
01C1 0  0000          ACTPN DC      0                                    PLOT1407
01C2 0  0000          BLNUM DC      0                                    PLOT1408
01C3 0  0000          PENX  DC      0                                    PLOT1409
01C4 0  0000          PENY  DC      0                                    PLOT1410
01C5 0  0301          X0301 DC      /0301                                PLOT1411
01C6 0  0103          X0103 DC      /0103                                PLOT1412
01C7 0  0606          X0606 DC      /0606                                PLOT1413
01C8 0  0600          X0600 DC      /0600                                PLOT1414
01C9 0  0F00          MASK  DC      /0F00                                PLOT1415
01CA 0  000F                DC      /000F                                PLOT1416
01CB 0  3050          MASKW DC      /3050                                PLOT1417
01CC 0  0706          PXC   DC      /0706                                PLOT1418
01CD 0  0607          PYC   DC      /0607                                PLOT1419
01CE 0  0506          MXC   DC      /0506                                PLOT1420
01CF 0  0605          MYC   DC      /0605                                PLOT1421
01D0 0  0706          X0706 DC      /0706                                PLOT1422
01D1 0  0506                DC      /0506                                PLOT1423
01AF                  K1    EQU     D1+1                                 PLOT1424
01D2 0  FFFF          KM1   DC      -1                                   PLOT1425
01D3 0  0002          K2    DC      2                                    PLOT1426
01D4 0  0003          K3    DC      3                                    PLOT1427
01D5 0  0004          K4    DC      4                                    PLOT1428
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01D6 0  000A        K10    DC       10                                        PLOT1429
01D7 0  FFE2        KM30   DC       -30                                       PLOT1430
01D8 0  0135        KLNGT  DC       AREAE-AREA-2 BUFFER LENGTH                PLOT1431
01DA    0000               BSS   E  0                                         PLOT1432
01DA 0  0406        END    DC       /0406                                     PLOT1433
01DB 0  0304               DC       /0304                                     PLOT1434
01DC 0  0000        AREA   DC       *-*                                       PLOT1435
01DD 0  0404               DC       /0404                                     PLOT1436
01DE 0  0404               DC       /0404                                     PLOT1437
01DF 0  0404               DC       /0404                                     PLOT1438
01E0 0  0404               DC       /0404                                     PLOT1439
01E1 0  0404               DC       /0404                                     PLOT1440
01E2 0  0303               DC       /0303                                     PLOT1441
01E3 0  0303               DC       /0303                                     PLOT1442
01E4 0  0303               DC       /0303                                     PLOT1443
01E5 0  0302               DC       /0302                                     PLOT1444
01E6 0  4220        AST    DC       /4220                                     PLOT1445
01E7 0  0050        CARD   DC       80                                        PLOT1446
01E8    0050               BSS      80                                        PLOT1447
0238 0  001C               DC       MES2-MES1                                 PLOT1448
0239    0024        MES1   DMES  1   ERROR IN CALCOMP CONTROL CARD. CORR'      PLOT1449
024B    0014               DMES  1  ECT THIS CARD. START'E                    PLOT1450
0255    0000        MES2   BSS      0                                         PLOT1451
0313    00BE        AREAE  BES      3*100+1-83-MES2+MES1                      PLOT1452
                    *                                                         PLOT1453
0313    0001               BSS      1                                         PLOT1454
0067                TVLOC  EQU      103                                       PLOT1455
01AC                R      EQU      X                                         PLOT1456
0314                       END                                                PLOT1457

     NO ERRORS IN ABOVE ASSEMBLY.
PLOT   PLTIR FINIM FINTR
DUP FUNCTION COMPLETED
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                *****************************************************  PLOT2002
                *  IBM 1800 SUBROUTINES FOR CALCOMP 506/1800.       *  PLOT2003
                *****************************************************  PLOT2004
                *                                                   *  PLOT2005
                *  CALLING SEQUENCE                                 *  PLOT2006
                *  ----------------                                 *  PLOT2007
                *  1.FORTRAN                                        *  PLOT2008
                *     CALL PLOT(X,Y,I)                              *  PLOT2009
                *     CALL PLTIR(X,Y,I)                             *  PLOT2010
                *     CALL FINIM(X,Y)                               *  PLOT2011
                *     CALL FINTR                                    *  PLOT2012
                *  2.ASSEMBLER                                      *  PLOT2013
                *     CALL     PLOT                                 *  PLOT2014
                *     DC       X          ABSCISSE                  *  PLOT2015
                *     DC       Y          ORDINATE                  *  PLOT2016
                *     DC       I          IND. FOR PEN UP OR DOWN   *  PLOT2017
                *     CALL     PLTIR                                *  PLOT2018
                *     DC       X                                    *  PLOT2019
                *     DC       Y                                    *  PLOT2020
                *     DC       I                                    *  PLOT2021
                *     CALL     FINIM                                *  PLOT2022
                *     DC       X                                    *  PLOT2023
                *     DC       Y                                    *  PLOT2024
                *     CALL     FINTR                                *  PLOT2025
                *                                                   *  PLOT2026
                *****************************************************  PLOT2027
001A    174D68C0        ENT      PLOT                                  PLOT2028
0000    174E3259        ENT      PLTIR                                 PLOT2029
0011    06255254        ENT      FINIM                                 PLOT2030
000E    062558D9        ENT      FINTR                                 PLOT2031
                *                                                      PLOT2032
0000 0  0000    PLTIR DC         0          ENTRY PLTIR                PLOT2033
0001 01 440000AF        BSI   L  SAVE                                  PLOT2034
0003 01 65800000        LDX   I1 PLTIR      SEARCH ADDRESS OF 1. PAR.  PLOT2035
0005 0  1010            SLA      16                                    PLOT2036
0006 0  D26B            STO    2 IND2-R      IND2=0                    PLOT2037
0007 00 C5800002        LD    I1 2           SEARCH PARAMETER I        PLOT2038
0009 01 4C18001F        BSC   L  A2,+-       TEST IF I=0               PLOT2039
000B 0  C27F            LD     2 KM30-R                                PLOT2040
000C 0  D26A            STO    2 IND-R                                 PLOT2041
000D 0  7011            MDX      A2                                    PLOT2042
                *                                                      PLOT2043
000E 0  0000    FINTR DC         0          ENTRY FINTR                PLOT2044
000F 01 4C80000E        BSC   I  FINTR                                 PLOT2045
                *                                                      PLOT2046
0011 0  0000    FINIM DC         0          ENTRY FINIM                PLOT2047
0012 01 440000AF        BSI   L  SAVE                                  PLOT2048
0014 01 65800011        LDX   I1 FINIM                                 PLOT2049
0016 0  1010            SLA      16                                    PLOT2050
0017 0  D26C            STO    2 IND3-R                                PLOT2051
0018 0  C278            LD     2 K3-R                                  PLOT2052
0019 0  7007            MDX      A4                                    PLOT2053
                *                                                      PLOT2054
001A 0  0000    PLOT  DC         0          ENTRY PLOT                 PLOT2055
001B 01 440000AF        BSI   L  SAVE                                  PLOT2056
001D 01 6580001A        LDX   I1 PLOT                                  PLOT2057
                *                                                      PLOT2058
001F 00 C5800002 A2     LD    I1 2           LOAD PARAMETER I           PLOT2059
0021 0  B275     A4     CMP    2 ACTPN-R                               PLOT2060
0022 0  7000            MDX      *                                     PLOT2061
0023 0  4252            BSI    2 PEN-R                                 PLOT2062
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0024 0  62FE              LDX   2 -2                                    PLOT2063
0025 00 CD800000    A5    LDD   I1 0                                    PLOT2064
0027 01 DC0000D4          STD   L  X                                    PLOT2065
0029 20 064C4000          LIBF     FLD                                  PLOT2066
002A 1  00D4              DC       X          XT=INT(100*X)            PLOT2067
002B 20 06517A00          LIBF     FMPY                                 PLOT2068
002C 1  00D8              DC       D200P                                PLOT2069
002D 20 05246267          LIBF     EIFIX      YT=INT(100*Y)             PLOT2070
002E 01 8C0000D6          AD    L  D1                                   PLOT2071
0030 0  108F              SLT      15                                   PLOT2072
0031 01 D60000DF          STO   L2 XT+2                                 PLOT2073
0033 01 960000E5          S     L2 PENX+2                               PLOT2074
0035 01 D60000E1          STO   L2 DX+2       DX=XT-PENX                PLOT2075
0037 01 4C10003C          BSC   L  A6,-       ABSDX=/XT-PENX/           PLOT2076
0039 01 A40000E6          M     L  KM1                                  PLOT2077
003B 0  1090              SLT      16         DY=YT-PENY                PLOT2078
003C 01 D60000E3    A6    STO   L2 ABSDX+2    ABSDY=/YT-PENY/           PLOT2079
003E 01 C60000DF          LD    L2 XT+2       PENX=XT                   PLOT2080
0040 01 D60000E5          STO   L2 PENX+2     PENY=YT                   PLOT2081
0042 0  7101              MDX   1 1          XR1=XR1+1                 PLOT2082
0043 0  7201              MDX   2 1          XR2=XR2+1                 PLOT2083
0044 0  70E0              MDX      A5        REPEAT FOR Y              PLOT2084
                    *                                                   PLOT2085
0045 01 6D00001A          STX   L1 RETRN      SAVE RETURN ADDRESS       PLOT2086
0047 01 66000070          LDX   L2 R          XR2 HAS RELOCATION ADDR.  PLOT2087
                    *                                                   PLOT2088
0049 0  C26F              LD    2 DX-R                                  PLOT2089
004A 01 4C28005F          BSC   L  A9,+Z                                PLOT2090
004C 0  C270              LD    2 DY-R                                  PLOT2091
004D 01 4C28005A          BSC   L  A8,+Z                                PLOT2092
004F 0  C277              LD    2 K2-R                                  PLOT2093
0050 0  D048              STO      DIAG                                 PLOT2094
0051 0  C267              LD    2 K1-R                                  PLOT2095
0052 0  D049              STO      HOR                                  PLOT2096
0053 0  C271        A7    LD    2 ABSDX-R                               PLOT2097
0054 0  9272              S     2 ABSDY-R                               PLOT2098
0055 01 4C280072          BSC   L  A15,+Z                               PLOT2099
0057 0  C278              LD    2 K3-R                                  PLOT2100
0058 0  D043              STO      HOR                                  PLOT2101
0059 0  7018              MDX      A15                                  PLOT2102
005A 0  C279        A8    LD    2 K4-R                                  PLOT2103
005B 0  D03D              STO      DIAG                                 PLOT2104
005C 0  C27A              LD    2 K5-R                                  PLOT2105
005D 0  D03E              STO      HOR                                  PLOT2106
005E 0  70F4              MDX      A7                                   PLOT2107
005F 0  C270        A9    LD    2 DY-R                                  PLOT2108
0060 01 4C28006D          BSC   L  A11,+Z                               PLOT2109
0062 0  C27D              LD    2 K8-R                                  PLOT2110
0063 0  D035              STO      DIAG                                 PLOT2111
0064 0  C267              LD    2 K1-R                                  PLOT2112
0065 0  D036              STO      HOR                                  PLOT2113
0066 0  C271        A10   LD    2 ABSDX-R                               PLOT2114
0067 0  9272              S     2 ABSDY-R                               PLOT2115
0068 01 4C280072          BSC   L  A15,+Z                               PLOT2116
006A 0  C27C              LD    2 K7-R                                  PLOT2117
006B 0  D030              STO      HOR                                  PLOT2118
006C 0  7005              MDX      A15                                  PLOT2119
006D 0  C27B        A11   LD    2 K6-R                                  PLOT2120
006E 0  D02A              STO      DIAG                                 PLOT2121
006F 0  C27A              LD    2 K5-R                                  PLOT2122
0070 0  D02B              STO      HOR                                  PLOT2123
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0071 0  70F4            MDX     A10                                     PLOT2124
                *                                                       PLOT2125
0072 0  C271    A15     LD    2 ABSDX-R                                 PLOT2126
0073 0  B272            CMP   2 ABSDY-R                                 PLOT2127
0074 0  7001            MDX     A22                                     PLOT2128
0075 0  7004            MDX     A23                                     PLOT2129
0076 0  C272    A22     LD    2 ABSDY-R                                 PLOT2130
0077 0  D264            STO   2 RATIO-R                                 PLOT2131
0078 0  C271            LD    2 ABSDX-R                                 PLOT2132
0079 0  7002            MDX     A24                                     PLOT2133
007A 0  D264    A23     STO   2 RATIO-R                                 PLOT2134
007B 0  C272            LD    2 ABSDY-R                                 PLOT2135
007C 0  D005    A24     STO     TEST+1          TEST=MAX(/DX/,/DY/)     PLOT2136
007D 01 4C08009F        BSC   L A31,+           BRANCH IF TEST=0        PLOT2137
007F 0  1881            SRT     1                                       PLOT2138
0080 0  D265            STO   2 ACCUM-R                                 PLOT2139
0081 00 65000000  TEST  LDX   L1 *-*            XR1=MAX(/DX/,/DY/)      PLOT2140
0083 01 740000DB  A25   MDX   L IND2,0          WAS ENTRY POINT PLTIR   PLOT2141
0085 0  700B            MDX     A27             NO                      PLOT2142
0086 01 740100DA        MDX   L IND,1           YES, IND=IND+1          PLOT2143
0088 0  7008            MDX     A27                                     PLOT2144
0089 0  C277            LD    2 K2-R            CHANGE PEN POSITION     PLOT2145
008A 0  B275            CMP   2 ACTPN-R                                 PLOT2146
008B 0  7002            MDX     A26                                     PLOT2147
008C 0  7001            MDX     A26                                     PLOT2148
008D 0  C278            LD    2 K3-R                                    PLOT2149
008E 0  4252    A26     BSI   2 PEN-R           BRANCH TO SUBR. PEN     PLOT2150
008F 0  C27F            LD    2 KM30-R                                  PLOT2151
0090 0  D26A            STO   2 IND-R           IND=-30                 PLOT2152
0091 0  C265    A27     LD    2 ACCUM-R                                 PLOT2153
0092 0  8264            A     2 RATIO-R                                 PLOT2154
0093 0  D265            STO   2 ACCUM-R                                 PLOT2155
0094 0  90ED            S       TEST+1                                  PLOT2156
0095 01 4C28009B        BSC   L A28,+Z                                  PLOT2157
0097 0  D265            STO   2 ACCUM-R                                 PLOT2158
0098 20 174D68E7        LIBF    PLOTX                                   PLOT2159
0099 0  0000    DIAG    DC      *-*             DIAGONAL STEP           PLOT2160
009A 0  7002            MDX     *+2                                     PLOT2161
009B 20 174D68E7  A28   LIBF    PLOTX                                   PLOT2162
009C 0  0000    HOR     DC      *-*             HOR. OR VERTICAL STEP   PLOT2163
009D 0  71FF            MDX   1 -1                                      PLOT2164
009E 0  70E4            MDX     A25                                     PLOT2165
009F 01 740000DC  A31   MDX   L IND3,0          WAS ENTRY POINT FINIM   PLOT2166
00A1 0  7007            MDX     A32             NO                      PLOT2167
00A2 0  6839            STX     IND3            YES                     PLOT2168
00A3 0  1010            SLA     16                                      PLOT2169
00A4 0  D273            STO   2 PENX-R                                  PLOT2170
00A5 0  D274            STO   2 PENY-R                                  PLOT2171
00A6 0  61E2            LDX   1 -30                                     PLOT2172
00A7 0  6932            STX   1 IND                                     PLOT2173
00A8 0  7003            MDX     A33                                     PLOT2174
00A9 0  6831    A32     STX     IND2                                    PLOT2175
00AA 01 7401001A        MDX   L RETRN,1                                 PLOT2176
00AC 0  400C    A33     BSI     RSTOR           RESTORE INDEX REGISTERS PLOT2177
00AD 01 4C80001A        BSC   I RETRN                                   PLOT2178
                *                                                       PLOT2179
                *       SUBROUTINE TO SAVE THE INDEX REGISTERS          PLOT2180
                *                                                       PLOT2181
00AF 0  0000    SAVE    DC      0                                       PLOT2182
00B0 0  690A            STX   1 XR1+1                                   PLOT2183
00B1 0  6A0B            STX   2 XR2+1                                   PLOT2184
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00B2 0  6B0C              STX   3 XR3+1                                  PLOT2185
00B3 01 66000070          LDX  L2 R                                       PLOT2186
00B5 00 67800067          LDX  I3 TVLOC                                   PLOT2187
00B7 01 4C8000AF          BSC  I  SAVE                                    PLOT2188
                     *                                                    PLOT2189
                     *    SUBROUTINE TO RESTORE THE INDEX REGISTERS       PLOT2190
                     *                                                    PLOT2191
00B9 0  0000         RSTOR DC      0                                      PLOT2192
00BA 00 65000000     XR1   LDX  L1 *-*                                    PLOT2193
00BC 00 66000000     XR2   LDX  L2 *-*                                    PLOT2194
00BE 00 67000000     XR3   LDX  L3 *-*                                    PLOT2195
00C0 01 4C8000B9          BSC  I  RSTOR                                   PLOT2196
                     *                                                    PLOT2197
                     *    SUBROUTINE TO CHANGE THE PEN POSITION           PLOT2198
                     *                                                    PLOT2199
00C2 0  0000         PEN   DC      0                                      PLOT2200
00C3 0  B277               CMP   2 K2-R                                   PLOT2201
00C4 0  7004               MDX     PEN1                                   PLOT2202
00C5 0  7003               MDX     PEN1                                   PLOT2203
00C6 0  D275               STO   2 ACTPN-R                                PLOT2204
00C7 0  C266               LD    2 K0-R                                   PLOT2205
00C8 0  7005               MDX     PEN2                                   PLOT2206
00C9 0  B278         PEN1  CMP   2 K3-R                                   PLOT2207
00CA 0  7006               MDX     PENEX      I NOT 2 OR 3 -- RETURN      PLOT2208
00CB 0  7005               MDX     PENEX                                  PLOT2209
00CC 0  D275               STO   2 ACTPN-R                                PLOT2210
00CD 0  C27E               LD    2 K9-R                                   PLOT2211
00CE 0  D001         PEN2  STO     PEN3                                   PLOT2212
00CF 20 174D68E7           LIBF    PLOTX                                  PLOT2213
00D0 0  0000         PEN3  DC      *-*                                    PLOT2214
00D1 01 4C8000C2     PENEX BSC  I  PEN                                    PLOT2215
                     *                                                    PLOT2216
                     *    CONSTANTS                                       PLOT2217
                     *                                                    PLOT2218
00D4 00 00000000     X     DEC     0                                      PLOT2219
00D6 00 00000001     D1    DEC     1                                      PLOT2220
00D8 00 64000088     D200P DEC     200.                                   PLOT2221
00DA 0  FFE2         IND   DC      -30                                    PLOT2222
00DB 0  FFFF         IND2  DC      /FFFF                                  PLOT2223
00DC 0  FFFF         IND3  DC      /FFFF                                  PLOT2224
00D4                 RATIO EQU     X                                      PLOT2225
00D5                 ACCUM EQU     X+1                                    PLOT2226
001A                 RETRN EQU     PLOT                                   PLOT2227
00DD 0  0000         XT    DC      *-*                                    PLOT2228
00DE 0  0000         YT    DC      *-*                                    PLOT2229
00DF 0  0000         DX    DC      *-*                                    PLOT2230
00E0 0  0000         DY    DC      *-*                                    PLOT2231
00E1 0  0000         ABSDX DC      *-*                                    PLOT2232
00E2 0  0000         ABSDY DC      *-*                                    PLOT2233
00E3 0  0000         PENX  DC      *-*                                    PLOT2234
00E4 0  0000         PENY  DC      *-*                                    PLOT2235
00E5 0  0000         ACTPN DC      *-*                                    PLOT2236
00D6                 K0    EQU     D1                                     PLOT2237
00D7                 K1    EQU     D1+1                                   PLOT2238
00E6 0  FFFF         KM1   DC      -1                                     PLOT2239
00E7 0  0002         K2    DC      2                                      PLOT2240
00E8 0  0003         K3    DC      3                                      PLOT2241
00E9 0  0004         K4    DC      4                                      PLOT2242
00EA 0  0005         K5    DC      5                                      PLOT2243
00EB 0  0006         K6    DC      6                                      PLOT2244
00EC 0  0007         K7    DC      7                                      PLOT2245
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00ED 0  0008        K8      DC      8                       PLOT2246
00EE 0  0009        K9      DC      9                       PLOT2247
00EF 0  FFE2        KM30    DC      -30                     PLOT2248
0067                TVLOC   EQU     103                     PLOT2249
0070                R       EQU     KM30-127                PLOT2250
00F0                        END                             PLOT2251

     NO ERRORS IN ABOVE ASSEMBLY.
PLOT  PLTIR FINIM FINTR
DUP FUNCTION COMPLETED
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                *************************************************** PLOT3002
                *  IBM 1800 SUBROUTINES FOR CALCOMP 506/1800.     * PLOT3003
                *************************************************** PLOT3004
                *                                                 * PLOT3005
                *  CALLING SEQUENCE                               * PLOT3006
                *  ---------------                                * PLOT3007
                *  1.FORTRAN                                      * PLOT3008
                *     CALL PLOT(X,Y,I)                            * PLOT3009
                *     CALL PLTIR(X,Y,I)                           * PLOT3010
                *     CALL FINIM(X,Y)                             * PLOT3011
                *     CALL FINTR                                  * PLOT3012
                *  2.ASSEMBLER                                    * PLOT3013
                *     CALL     PLOT                               * PLOT3014
                *     DC       X          ABSCISSE                * PLOT3015
                *     DC       Y          ORDINATE                * PLOT3016
                *     DC       I          IND. FOR PEN UP OR DOWN * PLOT3017
                *     CALL     PLTIR                              * PLOT3018
                *     DC       X                                  * PLOT3019
                *     DC       Y                                  * PLOT3020
                *     DC       I                                  * PLOT3021
                *     CALL     FINIM                              * PLOT3022
                *     DC       X                                  * PLOT3023
                *     DC       Y                                  * PLOT3024
                *     CALL     FINTR                              * PLOT3025
                *                                                 * PLOT3026
                *************************************************** PLOT3027
001C     174D68C0          ENT      PLOT                          PLOT3028
0000     174E3259          ENT      PLTIR                         PLOT3029
0014     06255254          ENT      FINIM                         PLOT3030
000E     062558D9          ENT      FINTR                         PLOT3031
                *                                                 PLOT3032
0000 0   0000      PLTIR DC       0          ENTRY PLTIR          PLOT3033
0001 01  44000117        BSI  L   SAVE                           PLOT3034
0003 01  65800000        LDX  I1  PLTIR      SEARCH ADDRESS OF 1. PAR. PLOT3035
0005 0   1010            SLA      16                             PLOT3036
0006 0   D246            STO    2 IND2-R      IND2=0             PLOT3037
0007 00  C5800002        LD   I1  2           SEARCH PARAMETER I PLOT3038
0009 01  4C180021        BSC  L   A3,+-       TEST IF I=0        PLOT3039
000B 0   C25F            LD     2 KM30-R                        PLOT3040
000C 0   D244            STO    2 IND-R                         PLOT3041
000D 0   7013            MDX      A3                            PLOT3042
                *                                                 PLOT3043
000E 0   0000      FINTR DC       0          ENTRY FINTR          PLOT3044
000F 01  44000117        BSI  L   SAVE                           PLOT3045
0011 0   1010            SLA      16                             PLOT3046
0012 0   D248            STO    2 IND4-R      IND4=0             PLOT3047
0013 0   700D            MDX      A3                            PLOT3048
                *                                                 PLOT3049
0014 0   0000      FINIM DC       0          ENTRY FINIM          PLOT3050
0015 01  44000117        BSI  L   SAVE                           PLOT3051
0017 01  65800014        LDX  I1  FINIM                          PLOT3052
0019 0   1010            SLA      16                             PLOT3053
001A 0   D247            STO    2 IND3-R                        PLOT3054
001B 0   7005            MDX      A3                            PLOT3055
                *                                                 PLOT3056
001C 0   0000      PLOT  DC       0          ENTRY PLOT           PLOT3057
001D 01  44000117        BSI  L   SAVE                           PLOT3058
001F 01  6580001C        LDX  I1  PLOT                           PLOT3059
                *                                                 PLOT3060
0021 01  74000172  A3    MDX  L   ACTPN,0     TEST IF NEW PLOT   PLOT3061
0023 0   7050            MDX      A15         NO                 PLOT3062
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0024 01 74000165          MDX  L  IND1,0      YES, TEST IF FIRST PLOT    PLOT3063
0026 0  7023              MDX     A7          NO                         PLOT3064
0027 20 03059115    A4    LIBF    CARDN       READ CONTROL CARD          PLOT3065
0028 0  1000              DC      /1000                                  PLOT3066
0029 1  0185              DC      CARD                                   PLOT3067
002A 0  0000              DC      0                                      PLOT3068
002B 20 03059115    A5    LIBF    CARDN       TEST IF OPERATION COMPLETE PLOT3069
002C 0  0000              DC      0                                      PLOT3070
002D 0  70FD              MDX     A5                                     PLOT3071
002E 0  C266              LD    2 CARD+1-R                               PLOT3072
002F 0  9264              S     2 AST-R       TEST IF A CALCOMP CONTROL  PLOT3073
0030 01 4C18003B          BSC  L  A6,+-       CARD                       PLOT3074
0032 20 176558D5          LIBF    PRNTN                                  PLOT3075
0033 0  3F00              DC      /3F00                                  PLOT3076
0034 20 176558D5          LIBF    PRNTN                                  PLOT3077
0035 0  2100              DC      /2100       PRINT MESSAGE              PLOT3078
0036 1  01D6              DC      MES1-1                                 PLOT3079
0037 0  0000        A55   DC      0                                      PLOT3080
0038 20 17064885          LIBF    PAUSE       WAIT NUMBER 3              PLOT3081
0039 1  0177              DC      K3                                     PLOT3082
003A 0  70EC              MDX     A4          BRANCH TO READ CONTROL     PLOT3083
003B 0  C268        A6    LD    2 CARD+3-R    CARD DETERMINE UNIT NUMBER PLOT3084
003C 0  6206              LDX   2 6                                      PLOT3085
003D 0  1240              SLCA  2 0                                      PLOT3086
003E 0  6AF8              STX   2 A55                                    PLOT3087
003F 01 66000120          LDX  L2 R                                      PLOT3088
0041 0  C258              LD    2 K4-R                                   PLOT3089
0042 0  90F4              S       A55                                    PLOT3090
0043 0  E80A              OR      A9                                     PLOT3091
0044 0  D009              STO     A9                                     PLOT3092
0045 0  C258              LD    2 K4-R                                   PLOT3093
0046 0  90F0              S       A55                                    PLOT3094
0047 0  E81E              OR      A12                                    PLOT3095
0048 0  D01D              STO     A12                                    PLOT3096
0049 0  D245              STO   2 IND1-R                                 PLOT3097
004A 01 74000168    A7    MDX  L  IND4,0      WAS ENTRY POINT FINTR      PLOT3098
004C 0  7027              MDX     A15         NO                         PLOT3099
004D 20 140478C0          LIBF    MAGT                                   PLOT3100
004E 0  8000        A9    DC      /8000                                  PLOT3101
004F 0  4201              BSI   2 RSTOR-R     RESTORE INDEX REGISTERS    PLOT3102
0050 01 4C80000E          BSC  I  FINTR       RETURN                     PLOT3103
                    *                                                    PLOT3104
                    *     SUBROUTINE FOR WRITING CALCOMP BUFFER ON TAPE  PLOT3105
                    *                                                    PLOT3106
0052 0  0000        A10   DC      0                                      PLOT3107
0053 01 C7000181          LD   L3 AREA                                   PLOT3108
0055 0  4818              BSC     +-                                     PLOT3109
0056 0  73FF              MDX   3 -1                                     PLOT3110
0057 01 6F000181          STX  L3 AREA        SET WORD COUNT             PLOT3111
0059 0  C261              LD    2 AREA-R                                 PLOT3112
005A 0  9241              S     2 K1-R                                   PLOT3113
005B 0  EA62              OR    2 AREA+1-R                               PLOT3114
005C 0  D262              STO   2 AREA+1-R                               PLOT3115
005D 0  C261              LD    2 AREA-R                                 PLOT3116
005E 0  925D              S     2 K9-R                                   PLOT3117
005F 01 4C100063          BSC  L  A11,-                                  PLOT3118
0061 0  C25D              LD    2 K9-R                                   PLOT3119
0062 0  D261              STO   2 AREA-R                                 PLOT3120
0063 00 67800067    A11   LDX  I3 TVLOC       TRANSFER VECTOR LOCATION   PLOT3121
0065 20 140478C0          LIBF    MAGT        WRITE TAPE                 PLOT3122
0066 0  3000        A12   DC      /3000                                  PLOT3123
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0067 1  0181              DC      AREA                                    PLOT3124
0068 1  012A              DC      USER            USER SUBROUTINE         PLOT3125
0069 20 140478C0  A13     LIBF    MAGT            TEST IF OP. COMPLETE    PLOT3126
006A 0  0000              DC      0                                       PLOT3127
006B 0  70FD              MDX     A13                                     PLOT3128
006C 0  6310              LDX   3 16                                      PLOT3129
006D 01 6F00013E          STX   L3 STOR1+1                                PLOT3130
006F 0  6302              LDX   3 2               XR3=2                   PLOT3131
0070 0  10A0              SLT     32                                      PLOT3132
0071 0  DA62              STD   2 AREA+1-R                                PLOT3133
0072 01 4C800052          BSC   I A10                                     PLOT3134
                  *                                                       PLOT3135
                  *       END OF WRITING CALCOMP BUFFER ON TAPE           PLOT3136
                  *                                                       PLOT3137
0074 00 C5800002  A15     LD    I1 2              LOAD PARAMETER I        PLOT3138
0076 01 74000167          MDX   L  IND3,0         WAS ENTRY POINT FINIM   PLOT3139
0078 0  7001              MDX     A16             NO                      PLOT3140
0079 0  C257              LD    2 K3-R                                    PLOT3141
007A 01 678000E2  A16     LDX   I3 COUNT+1                                PLOT3142
007C 0  B252              CMP   2 ACTPN-R                                 PLOT3143
007D 0  7000              MDX     *                                       PLOT3144
007E 0  420D              BSI   2 PEN-R                                   PLOT3145
007F 0  6B62              STX   3 COUNT+1                                 PLOT3146
0080 0  62FE              LDX   2 -2                                      PLOT3147
0081 00 67800067          LDX   I3 TVLOC                                  PLOT3148
0083 00 CD800000  A17     LDD   I1 0                                      PLOT3149
0085 01 DC00015E          STD   L  X                                      PLOT3150
0087 20 064C4000          LIBF    FLD                                     PLOT3151
0088 1  015E              DC      X               XT=INT(100*X)           PLOT3152
0089 20 06517A00          LIBF    FMPY                                    PLOT3153
008A 1  0162              DC      D200P                                   PLOT3154
008B 20 05246267          LIBF    EIFIX           YT=INT(100*Y)           PLOT3155
008C 01 8C000160          AD    L D1                                      PLOT3156
008E 0  108F              SLT     15                                      PLOT3157
008F 01 D600016C          STO   L2 XT+2                                   PLOT3158
0091 01 96000172          S     L2 PENX+2                                 PLOT3159
0093 01 D600016E          STO   L2 DX+2           DX=XT-PENX              PLOT3160
0095 01 4C10009A          BSC   L  A18,-          ABSDX=/XT-PENX/         PLOT3161
0097 01 A4000175          M     L  KM1                                    PLOT3162
0099 0  1090              SLT     16              DY=YT-PENY              PLOT3163
009A 01 D6000170  A18     STO   L2 ABSDX+2        ABSDY=/YT-PENY/         PLOT3164
009C 01 C600016C          LD    L2 XT+2           PENX=XT                 PLOT3165
009E 01 D6000172          STO   L2 PENX+2         PENY=YT                 PLOT3166
00A0 0  7101              MDX   1 1              XR1=XR1+1                PLOT3167
00A1 0  7201              MDX   2 1              XR2=XR2+1                PLOT3168
00A2 0  70E0              MDX     A17            BRANCH IF XR2 NOT ZERO   PLOT3169
                  *                                                       PLOT3170
00A3 01 6D00001C          STX   L1 RETRN          SAVE RETURN ADDRESS     PLOT3171
00A5 01 66000120          LDX   L2 R              XR2 HAS RELOCATION ADDR. PLOT3172
                  *                                                       PLOT3173
                  *       CALCULATE CONSTANTS FOR MOTION                  PLOT3174
                  *                                                       PLOT3175
00A7 0  C24C              LD    2 DX-R                                    PLOT3176
00A8 01 4C2800BD          BSC   L  A21,+Z                                 PLOT3177
00AA 0  C24D              LD    2 DY-R                                    PLOT3178
00AB 01 4C2800B8          BSC   L  A20,+Z                                 PLOT3179
00AD 0  C256              LD    2 K2-R                                    PLOT3180
00AE 0  D253              STO   2 DIAG-R                                  PLOT3181
00AF 0  C241              LD    2 K1-R                                    PLOT3182
00B0 0  D254              STO   2 HOR-R                                   PLOT3183
00B1 0  C24E      A19     LD    2 ABSDX-R                                 PLOT3184
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00B2 0  924F              S     2 ABSDY-R                                  PLOT3185
00B3 01 4C2800D0          BSC  L  A24,+Z                                   PLOT3186
00B5 0  C257              LD    2 K3-R                                     PLOT3187
00B6 0  D254              STO   2 HOR-R                                    PLOT3188
00B7 0  7018              MDX     A24                                      PLOT3189
00B8 0  C258        A20   LD    2 K4-R                                     PLOT3190
00B9 0  D253              STO   2 DIAG-R                                   PLOT3191
00BA 0  C259              LD    2 K5-R                                     PLOT3192
00BB 0  D254              STO   2 HOR-R                                    PLOT3193
00BC 0  70F4              MDX     A19                                      PLOT3194
00BD 0  C24D        A21   LD    2 DY-R                                     PLOT3195
00BE 01 4C2800CB          BSC  L  A23,+Z                                   PLOT3196
00C0 0  C25C              LD    2 K8-R                                     PLOT3197
00C1 0  D253              STO   2 DIAG-R                                   PLOT3198
00C2 0  C241              LD    2 K1-R                                     PLOT3199
00C3 0  D254              STO   2 HOR-R                                    PLOT3200
00C4 0  C24E        A22   LD    2 ABSDX-R                                  PLOT3201
00C5 0  924F              S     2 ABSDY-R                                  PLOT3202
00C6 01 4C2800D0          BSC  L  A24,+Z                                   PLOT3203
00C8 0  C25B              LD    2 K7-R                                     PLOT3204
00C9 0  D254              STO   2 HOR-R                                    PLOT3205
00CA 0  7005              MDX     A24                                      PLOT3206
00CB 0  C25A        A23   LD    2 K6-R                                     PLOT3207
00CC 0  D253              STO   2 DIAG-R                                   PLOT3208
00CD 0  C259              LD    2 K5-R                                     PLOT3209
00CE 0  D254              STO   2 HOR-R                                    PLOT3210
00CF 0  70F4              MDX     A22                                      PLOT3211
                    *                                                      PLOT3212
00D0 0  C24E        A24   LD    2 ABSDX-R                                  PLOT3213
00D1 0  B24F              CMP   2 ABSDY-R                                  PLOT3214
00D2 0  7001              MDX     A25                                      PLOT3215
00D3 0  7004              MDX     A26                                      PLOT3216
00D4 0  C24F        A25   LD    2 ABSDY-R                                  PLOT3217
00D5 0  D23E              STO   2 RATIO-R                                  PLOT3218
00D6 0  C24E              LD    2 ABSDX-R                                  PLOT3219
00D7 0  7002              MDX     A27                                      PLOT3220
00D8 0  D23E        A26   STO   2 RATIO-R                                  PLOT3221
00D9 0  C24F              LD    2 ABSDY-R                                  PLOT3222
00DA 0  D005        A27   STO     TEST+1     TEST=MAX(/DX/,/DY/)           PLOT3223
00DB 01 4C0800FF          BSC  L  A34,+      BRANCH IF TEST=0              PLOT3224
00DD 0  1881              SRT     1                                        PLOT3225
00DE 0  D23F              STO   2 ACCUM-R                                  PLOT3226
00DF 00 65000000    TEST  LDX  L1 *-*        XR1=MAX(/DX/,/DY/)            PLOT3227
00E1 00 67000002    COUNT LDX  L3 2          XR3 = BUFFER COUNTER          PLOT3228
00E3 01 74000166    A28   MDX  L  IND2,0     WAS ENTRY POINT PLTIR         PLOT3229
00E5 0  700B              MDX     A30        NO                            PLOT3230
00E6 01 74010164          MDX  L  IND,1      YES, IND=IND+1                PLOT3231
00E8 0  7008              MDX     A30                                      PLOT3232
00E9 0  C256              LD    2 K2-R       CHANGE PEN POSITION           PLOT3233
00EA 0  B252              CMP   2 ACTPN-R                                  PLOT3234
00EB 0  7002              MDX     A29                                      PLOT3235
00EC 0  7001              MDX     A29                                      PLOT3236
00ED 0  C257              LD    2 K3-R                                     PLOT3237
00EE 0  420D        A29   BSI   2 PEN-R      BRANCH TO SUBR. PEN           PLOT3238
00EF 0  C25F              LD    2 KM30-R                                   PLOT3239
00F0 0  D244              STO   2 IND-R      IND=-30                       PLOT3240
00F1 0  C23F        A30   LD    2 ACCUM-R                                  PLOT3241
00F2 0  823E              A     2 RATIO-R                                  PLOT3242
00F3 0  D23F              STO   2 ACCUM-R                                  PLOT3243
00F4 0  90EB              S       TEST+1                                   PLOT3244
00F5 01 4C2800FA          BSC  L  A31,+Z                                   PLOT3245
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00F7 0  D23F            STO   2 ACCUM-R                                PLOT3246
00F8 0  C253            LD    2 DIAG-R                                 PLOT3247
00F9 0  7001            MDX     *+1                                    PLOT3248
00FA 0  C254      A31   LD    2 HOR-R                                  PLOT3249
00FB 0  421C            BSI   2 STORE-R                                PLOT3250
00FC 0  71FF            MDX   1 -1                                     PLOT3251
00FD 0  70E5            MDX     A28                                    PLOT3252
00FE 0  6BE3            STX   3 COUNT+1                                PLOT3253
                  *                                                    PLOT3254
00FF 01 74000167  A34   MDX L   IND3,0      WAS ENTRY POINT FINIM      PLOT3255
0101 0  700F            MDX     A35         NO                         PLOT3256
0102 0  6864            STX     IND3        YES                        PLOT3257
0103 0  1010            SLA     16                                     PLOT3258
0104 0  D250            STO   2 PENX-R                                 PLOT3259
0105 0  D251            STO   2 PENY-R                                 PLOT3260
0106 0  D252            STO   2 ACTPN-R                                PLOT3261
0107 0  61E2            LDX   1 -30                                    PLOT3262
0108 0  695B            STX   1 IND                                    PLOT3263
0109 01 678000E2        LDX  I3 COUNT+1     XR3 HAS BUFFER COUNTER     PLOT3264
010B 0  C249            LD    2 X8000-R                                PLOT3265
010C 0  D262            STO   2 AREA+1-R    SET END-OF-DESIGN IND.     PLOT3266
010D 01 44000052        BSI L   A10                                    PLOT3267
010F 0  6BD2            STX   3 COUNT+1                                PLOT3268
0110 0  7003            MDX     A36                                    PLOT3269
0111 0  6854      A35   STX     IND2                                   PLOT3270
0112 01 7401001C        MDX L   RETRN,1                                PLOT3271
0114 0  400C      A36   BSI     RSTOR       RESTORE INDEX REGISTERS    PLOT3272
0115 01 4C80001C        BSC  I  RETRN                                  PLOT3273
                  *                                                    PLOT3274
                  *     SUBROUTINE TO SAVE THE INDEX REGISTERS         PLOT3275
                  *                                                    PLOT3276
0117 0  0000      SAVE  DC        0                                    PLOT3277
0118 0  690A            STX   1 XR1+1                                  PLOT3278
0119 0  6A0B            STX   2 XR2+1                                  PLOT3279
011A 0  6B0C            STX   3 XR3+1                                  PLOT3280
011B 01 66000120        LDX  L2 R                                      PLOT3281
011D 00 67800067        LDX  I3 TVLOC                                  PLOT3282
011F 01 4C800117        BSC  I  SAVE                                   PLOT3283
                  *                                                    PLOT3284
                  *     SUBROUTINE TO RESTORE THE INDEX REGISTERS      PLOT3285
                  *                                                    PLOT3286
0121 0  0000      RSTOR DC        0                                    PLOT3287
0122 00 65000000  XR1   LDX  L1 *-*                                    PLOT3288
0124 00 66000000  XR2   LDX  L2 *-*                                    PLOT3289
0126 00 67000000  XR3   LDX  L3 *-*                                    PLOT3290
0128 01 4C800121        BSC  I  RSTOR                                  PLOT3291
                  *                                                    PLOT3292
                  *     USER SUBROUTINE FOR MAG. TAPE                  PLOT3293
                  *                                                    PLOT3294
012A 0  0000      USER  DC        0                                    PLOT3295
012B 01 4C80012A        BSC  I  USER                                   PLOT3296
                  *                                                    PLOT3297
                  *     SUBROUTINE TO CHANGE THE PEN POSITION          PLOT3298
                  *                                                    PLOT3299
012D 0  0000      PEN   DC        0                                    PLOT3300
012E 0  B256            CMP   2 K2-R                                   PLOT3301
012F 0  7004            MDX     PEN1                                   PLOT3302
0130 0  7003            MDX     PEN1                                   PLOT3303
0131 0  D252            STO   2 ACTPN-R                                PLOT3304
0132 0  C25E            LD    2 KA-R                                   PLOT3305
0133 0  7005            MDX     PEN2                                   PLOT3306
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0134 0  B257        PEN1  CMP   2 K3-R                                  PLOT3307
0135 0  7004              MDX     PENEX       I NOT 2 OR 3 -- RETURN    PLOT3308
0136 0  7003              MDX     PENEX                                 PLOT3309
0137 0  D252              STO   2 ACTPN-R                               PLOT3310
0138 0  C25D              LD    2 K9-R                                  PLOT3311
0139 0  4002        PEN2  BSI     STORE                                 PLOT3312
013A 01 4C80012D    PENEX BSC   I PEN                                   PLOT3313
                    *                                                   PLOT3314
                    *     SUBROUTINE FOR STORING CONSTANTS IN BUFFER    PLOT3315
                    *                                                   PLOT3316
013C 0  0000        STORE DC      0                                     PLOT3317
013D 00 66000010    STOR1 LDX   L2 16                                   PLOT3318
013F 0  72FC              MDX   2 -4                                    PLOT3319
0140 0  1200              SLA   2 0                                     PLOT3320
0141 01 EF000181          OR    L3 AREA                                 PLOT3321
0143 01 D7000181          STO   L3 AREA                                 PLOT3322
0145 0  7200              MDX   2 0                                     PLOT3323
0146 0  7011              MDX     STOR2                                 PLOT3324
0147 0  7301              MDX   3 1                                     PLOT3325
0148 0  1010              SLA     16                                    PLOT3326
0149 01 D7000181          STO   L3 AREA                                 PLOT3327
014B 0  6210              LDX   2 16                                    PLOT3328
014C 0  6AF1              STX   2 STOR1+1                               PLOT3329
014D 01 66000120          LDX   L2 R                                    PLOT3330
014F 0  6B92              STX   3 COUNT+1                               PLOT3331
0150 0  C091              LD      COUNT+1                               PLOT3332
0151 01 B4000180          CMP   L KLNGT                                 PLOT3333
0153 0  7001              MDX     *+1                                   PLOT3334
0154 0  7006              MDX     STOR3                                 PLOT3335
0155 01 44000052          BSI   L A10                                   PLOT3336
0157 0  7003              MDX     STOR3                                 PLOT3337
0158 0  6AE5        STOR2 STX   2 STOR1+1                               PLOT3338
0159 01 66000120          LDX   L2 R                                    PLOT3339
015B 01 4C80013C    STOR3 BSC   I STORE                                 PLOT3340
                    *                                                   PLOT3341
                    *     CONSTANTS                                     PLOT3342
                    *                                                   PLOT3343
015E 00 00000000    X     DEC     0                                     PLOT3344
0160 00 00000001    D1    DEC     1                                     PLOT3345
0162 00 64000088    D200P DEC     200.                                  PLOT3346
0164 0  FFE2        IND   DC      -30                                   PLOT3347
0165 0  0000        IND1  DC      0                                     PLOT3348
0166 0  FFFF        IND2  DC      /FFFF                                 PLOT3349
0167 0  FFFF        IND3  DC      /FFFF                                 PLOT3350
0168 0  FFFF        IND4  DC      /FFFF                                 PLOT3351
0169 0  8000        X8000 DC      /8000                                 PLOT3352
015E                RATIO EQU     X                                     PLOT3353
015F                ACCUM EQU     X+1                                   PLOT3354
001C                RETRN EQU     PLOT                                  PLOT3355
016A 0  0000        XT    DC      *-*                                   PLOT3356
016B 0  0000        YT    DC      *-*                                   PLOT3357
016C 0  0000        DX    DC      *-*                                   PLOT3358
016D 0  0000        DY    DC      *-*                                   PLOT3359
016E 0  0000        ABSDX DC      *-*                                   PLOT3360
016F 0  0000        ABSDY DC      *-*                                   PLOT3361
0170 0  0000        PENX  DC      *-*                                   PLOT3362
0171 0  0000        PENY  DC      *-*                                   PLOT3363
0172 0  0000        ACTPN DC      *-*                                   PLOT3364
0173 0  0000        DIAG  DC      0                                     PLOT3365
0174 0  0000        HOR   DC      0                                     PLOT3366
0161                K1    EQU     D1+1                                  PLOT3367
```

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0175 0  FFFF        KM1    DC       -1                                                    PLOT3368
0176 0  0002        K2     DC       2                                                     PLOT3369
0177 0  0003        K3     DC       3                                                     PLOT3370
0178 0  0004        K4     DC       4                                                     PLOT3371
0179 0  0005        K5     DC       5                                                     PLOT3372
017A 0  0006        K6     DC       6                                                     PLOT3373
017B 0  0007        K7     DC       7                                                     PLOT3374
017C 0  0008        K8     DC       8                                                     PLOT3375
017D 0  0009        K9     DC       9                                                     PLOT3376
017E 0  000A        KA     DC       /000A                                                 PLOT3377
017F 0  FFE2        KM30   DC       -30                                                   PLOT3378
0180    0000               BSS   E  0                                                     PLOT3379
0180 0  0141        KLNGT  DC       KLNG                                                  PLOT3380
0181 0  0000        AREA   DC       *-*                                                   PLOT3381
0182 00 00000000           DEC      0                                                     PLOT3382
0184 0  4220        AST    DC       /4220                                                 PLOT3383
0185 0  0050        CARD   DC       80                                                    PLOT3384
0186    0050               BSS      80                                                    PLOT3385
01D6 0  001C               DC       MES2-MES1                                             PLOT3386
01D7    0024        MES1   DMES   1  ERROR IN CALCOMP CONTROL CARD. CORR'                 PLOT3387
01E9    0014               DMES   1 ECT THIS CARD. START'E                               PLOT3388
01F3    0000        MES2   BSS      0                                                     PLOT3389
01F3    0000        AREAE  BSS      0                                                     PLOT3390
0141               KLNG   EQU      321                                                   PLOT3391
01F3    00D0               BSS      KLNG-AREAE+AREA+1                                     PLOT3392
0067               TVLOC  EQU      103                                                   PLOT3393
0120               R      EQU      AREA+30-127                                           PLOT3394
02C4                      END                                                            PLOT3395
```

NO ERRORS IN ABOVE ASSEMBLY.
PLOT PLTIR FINIM FINTR
DUP FUNCTION COMPLETED

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                        ************************************************** SYMBL002
                        *  IBM 1800 SUBROUTINES FOR CALCOMP 506/570.     * SYMBL003
                        ************************************************** SYMBL004
                        *                                                * SYMBL005
                        *  SUBROUTINE SYMBL                              * SYMBL006
                        *                                                * SYMBL007
                        *  CALLING SEQUENCE                              * SYMBL008
                        *  ----------------                              * SYMBL009
                        *  1.FORTRAN                                     * SYMBL010
                        *    CALL SYMBL(X,Y,SIZE,THETA,EBC,N)            * SYMBL011
                        *  2.ASSEMBLER                                   * SYMBL012
                        *    CALL     SYMBL                            * SYMBL013
                        *    DC       X          ABSCISSE              * SYMBL014
                        *    DC       Y          ORDINATE              * SYMBL015
                        *    DC       SIZE       HEIGHT OF SYMBOL      * SYMBL016
                        *    DC       THETA      ANGLE OF SYMBOLS      * SYMBL017
                        *    DC       EBC        VECTOR CONTAINING THE * SYMBL018
                        *                        CHARACTERS IN EBCDIC  * SYMBL019
                        *                        FORMAT (TWO PER WORD) * SYMBL020
                        *    DC       N          NUMBER OF SYMBOLS     * SYMBL021
                        *                                                * SYMBL022
                        ************************************************** SYMBL023
0000     22A14093       SYMBL    ENT      SYMBL                          SYMBL024
0000  0  0000           SYMBL    DC       0          ENTRY SYMBL         SYMBL025
0001  0  690F                    STX    1 X1+1       SAVE INDEX REGISTERS SYMBL026
0002  0  6A10                    STX    2 X2+1                           SYMBL027
0003  0  6B11                    STX    3 X3+1                           SYMBL028
0004 01  65800000              LDX   I1 SYMBL       XR1 HAS PARAM. ADDRESS SYMBL029
0006 01  66000160              LDX   L2 R           XR2 HAS RELOCATION CONST. SYMBL030
0008 00  67800067              LDX   I3 TVLOC                           SYMBL031
000A 00  C5800005              LD    I1 5           SEARCH PARAMETER N  SYMBL032
000C 01  4C200018              BSC   L  S1,Z        RETURN IF ZERO      SYMBL033
000E 01  74060000    EXIT      MDX   L  SYMBL,6     INCREMENT RETURN ADDRESS SYMBL034
0010 00  65000000    X1        LDX   L1 *-*         RESTORE INDEX REGISTERS SYMBL035
0012 00  66000000    X2        LDX   L2 *-*                             SYMBL036
0014 00  67000000    X3        LDX   L3 *-*                             SYMBL037
0016 01  4C800000              BSC   I  SYMBL       RETURN              SYMBL038
                        *                                               SYMBL039
                        *    SEARCH PARAMETERS                          SYMBL040
                        *                                               SYMBL041
0018 01  4C10001C    S1        BSC   L  S11,-       SEARCH ABS(N)       SYMBL042
001A  0  A2FB                  M      2 KM1-R                           SYMBL043
001B  0  1090                  SLT    16                                SYMBL044
001C  0  D2FA          S11     STO    2 ABSN-R                          SYMBL045
001D 00  CD800000              LDD   I1 0           SEARCH X            SYMBL046
001F  0  DAC2                  STD    2 XSYM-R      XSYM=X              SYMBL047
0020 00  CD800001              LDD   I1 1           SEARCH Y            SYMBL048
0022  0  DAD4                  STD    2 YSYM-R      YSYM=Y              SYMBL049
0023  0  C104                  LD     1 4           SEARCH ADDRESS BCD  SYMBL050
0024  0  D04A                  STO      S4+1                            SYMBL051
0025 00  CD800002              LDD   I1 2           SEARCH SIZE         SYMBL052
0027  0  BAEC                  DCM    2 SIZE-R                          SYMBL053
0028  0  7007                  MDX      S12                             SYMBL054
0029  0  7006                  MDX      S12                             SYMBL055
002A 00  CD800003              LDD   I1 3                               SYMBL056
002C  0  BAEA                  DCM    2 THETA-R                         SYMBL057
002D  0  7005                  MDX      S13                             SYMBL058
002E  0  7004                  MDX      S13                             SYMBL059
002F  0  702B                  MDX      S26                             SYMBL060
0030  0  DAEC          S12     STD    2 SIZE-R                          SYMBL061
0031 00  CD800003              LDD   I1 3                               SYMBL062
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0033 0  DAEA        S13   STD   2 THETA-R                                  SYMBL063
0034 20 064C4000          LIBF    FLD                                      SYMBL064
0035 1  014C              DC      SIZE                                     SYMBL065
0036 20 06517A00          LIBF    FMPY                                     SYMBL066
0037 1  014E              DC      D1D7                                     SYMBL067
0038 20 068A3580          LIBF    FSTO                                     SYMBL068
0039 1  0146              DC      FACT        FACT=SIZE/7.                 SYMBL069
                    *                                                      SYMBL070
                    *     CALCULATE MULTIPLES OF FACT*SIN(THETA) AND       SYMBL071
                    *     FACT*COS(THETA)                                  SYMBL072
                    *                                                      SYMBL073
003A 20 064C4000          LIBF    FLD                                      SYMBL074
003B 1  014A              DC      THETA                                    SYMBL075
003C 20 06517A00          LIBF    FMPY                                     SYMBL076
003D 1  0150              DC      D1D57       CHANGE IN RADIANS            SYMBL077
003E 20 068A3580          LIBF    FSTO                                     SYMBL078
003F 1  0126              DC      INCC                                     SYMBL079
0040 30 06889545          CALL    FSINE                                    SYMBL080
0042 20 06517A00          LIBF    FMPY                                     SYMBL081
0043 1  0146              DC      FACT                                     SYMBL082
0044 20 068A3580          LIBF    FSTO                                     SYMBL083
0045 1  0138              DC      INCS        INCS=FACT*SIN(THETA)         SYMBL084
                    *                                                      SYMBL085
0046 0  61F4              LDX   1 -12         XR1=-12                      SYMBL086
0047 20 06044100    S2    LIBF    FADD                                     SYMBL087
0048 1  0138              DC      INCS                                     SYMBL088
0049 20 068A35A7          LIBF    FSTOX       CALCULATE MULTIPLES OF       SYMBL089
004A 1  0146              DC      INCS+14     INCS                         SYMBL090
004B 0  7102              MDX   1 2                                        SYMBL091
004C 0  70FA              MDX     S2                                       SYMBL092
                    *                                                      SYMBL093
004D 30 060D6880          CALL    FCOS                                     SYMBL094
004F 1  0126              DC      INCC                                     SYMBL095
0050 20 06517A00          LIBF    FMPY                                     SYMBL096
0051 1  0146              DC      FACT                                     SYMBL097
0052 20 068A3580          LIBF    FSTO                                     SYMBL098
0053 1  0126              DC      INCC        INCC=FACT*COS(THETA)         SYMBL099
                    *                                                      SYMBL100
0054 0  61F4              LDX   1 -12                                      SYMBL101
0055 20 06044100    S25   LIBF    FADD                                     SYMBL102
0056 1  0126              DC      INCC                                     SYMBL103
0057 20 068A35A7          LIBF    FSTOX       CALCULATE MULTIPLES OF       SYMBL104
0058 1  0134              DC      INCC+14     INCC                         SYMBL105
0059 0  7102              MDX   1 2                                        SYMBL106
005A 0  70FA              MDX     S25                                      SYMBL107
                    *                                                      SYMBL108
005B 01 6C000157    S26   STX   L SWITC       SET SWITC NOT ZERO           SYMBL109
                    *                                                      SYMBL110
                    *     START LOOP FOR DIFFERENT CHARACTERS              SYMBL111
                    *                                                      SYMBL112
005D 0  C2FD        S3    LD      2 K3-R                                   SYMBL113
005E 0  D2F9              STO     2 I-R         I=3                        SYMBL114
005F 01 6C000154          STX   L END                                      SYMBL115
0061 01 6C000156          STX   L SWCEN                                    SYMBL116
0063 01 74000157          MDX   L SWITC,0     TEST SWITC                   SYMBL117
0065 0  7008              MDX     S4          NOT ZERO                     SYMBL118
0066 0  C2F8              LD      2 EBC-R     =0                           SYMBL119
0067 0  E2FF              AND     2 MASK-R    EXTRACT RIGHT HALF           SYMBL120
0068 01 7401006F          MDX   L S4+1,1                                   SYMBL121
006A 0  1000              NOP                                              SYMBL122
006B 01 6C000157          STX   L SWITC                                    SYMBL123
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006D 0  7012                    MDX     S5                                      SYMBL124
006E 00 C4000000        S4      LD    L *-*             LOAD SYMBOL IN EBCDIC   SYMBL125
0070 0  D2F8                    STO    2 EBC-R                                  SYMBL126
0071 20 08593142                LIBF    HOLEB           CHANGE TO CARD CODE     SYMBL127
0072 0  0001                    DC      1                                       SYMBL128
0073 1  0158                    DC      EBC                                     SYMBL129
0074 1  0148                    DC      CHAR                                    SYMBL130
0075 0  0002                    DC      2                                       SYMBL131
0076 20 085935D9                LIBF    HOLPR           CARD CODE TO PRINTER CODE SYMBL132
0077 0  0001                    DC      1                                       SYMBL133
0078 1  0148                    DC      CHAR                                    SYMBL134
0079 1  0158                    DC      EBC                                     SYMBL135
007A 0  0002                    DC      2                                       SYMBL136
007B 0  C2F8                    LD     2 EBC-R                                  SYMBL137
007C 0  1808                    SRA     8                                       SYMBL138
007D 0  6100                    LDX    1 0                                      SYMBL139
007E 01 6D000157                STX   L1 SWITC          SWITC=0                 SYMBL140
0080 01 4C1800EF        S5      BSC   L  S18,+-         BRANCH IF BLANK         SYMBL141
0082 0  D001                    STO      *+1                                    SYMBL142
0083 00 65000000                LDX   L1 *-*            XR1=CHAR. IN PRIN. CODE SYMBL143
0085 01 6C000155                STX   L  SWCO           SWCO NOT ZERO           SYMBL144
0087 01 C500015F                LD    L1 TAB-1          SEARCH START ADDRESS OF SYMBL145
0089 0  D001                    STO      S6+1           COORDINATES             SYMBL146
                        *                                                       SYMBL147
                        *       START LOOP FOR COORDINATES IN ONE CHARACTER      SYMBL148
                        *                                                       SYMBL149
008A 00 C4000000        S6      LD    L  *-*            LOAD COORDINATES        SYMBL150
008C 01 74000155                MDX   L  SWCO,0         TEST SWCO               SYMBL151
008E 0  7006                    MDX      S7                                     SYMBL152
008F 0  1008                    SLA      8                                      SYMBL153
0090 01 6C000155                STX   L  SWCO           SET SWCO NOT ZERO       SYMBL154
0092 01 7401008B                MDX   L  S6+1,1                                 SYMBL155
0094 0  7003                    MDX      S8                                     SYMBL156
0095 0  6100            S7      LDX    1 0                                      SYMBL157
0096 01 6D000155                STX   L1 SWCO           SET SWCO=0              SYMBL158
0098 01 4C10009E        S8      BSC   L  S9,-           TEST IF LAST COORDINATE SYMBL159
009A 0  6100                    LDX    1 0                                      SYMBL160
009B 01 6D000154                STX   L1 END            END=0                   SYMBL161
009D 0  E239                    AND    2 MASK1-R        CLEAR SIGN              SYMBL162
009E 0  188C            S9      SRT      12                                     SYMBL163
009F 0  1001                    SLA      1                                      SYMBL164
00A0 0  D2F2                    STO    2 FACTX-R        FACTX=2*ABSCISSE        SYMBL165
00A1 0  1010                    SLA      16                                     SYMBL166
00A2 0  1084                    SLT      4                                      SYMBL167
00A3 0  1001                    SLA      1                                      SYMBL168
00A4 0  D2F3                    STO    2 FACTY-R                                SYMBL169
00A5 0  C2F9                    LD     2 I-R            TEST IF START OF SYMBOL SYMBL170
00A6 0  92FC                    S      2 K2-R                                   SYMBL171
00A7 01 4C1800C1                BSC   L  S95,+-         IF NOT GO TO S95        SYMBL172
00A9 0  C2F3                    LD     2 FACTY-R        YES                     SYMBL173
00AA 0  92FE                    S      2 K16-R                                  SYMBL174
00AB 01 4C2800C8                BSC   L  S10,+Z         TEST IF CENTERED SYMBOL SYMBL175
00AD 0  D2F3                    STO    2 FACTY-R        YES                     SYMBL176
00AE 20 064C4000                LIBF    FLD                                     SYMBL177
00AF 1  0122                    DC      XSYM                                    SYMBL178
00B0 20 06044100                LIBF    FADD                                    SYMBL179
00B1 1  013A                    DC      YT2                                     SYMBL180
00B2 20 068A4080                LIBF    FSUB                                    SYMBL181
00B3 1  0128                    DC      XT2                                     SYMBL182
00B4 20 068A3580                LIBF    FSTO                                    SYMBL183
00B5 1  0122                    DC      XSYM            XSYM=XSYM-XT2+YT2       SYMBL184
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00B6 20 064C4000          LIBF    FLD                                    SYMBL185
00B7 1  0134              DC      YSYM                                   SYMBL186
00B8 20 068A4080          LIBF    FSUB                                   SYMBL187
00B9 1  013A              DC      YT2                                    SYMBL188
00BA 20 068A4080          LIBF    FSUB                                   SYMBL189
00BB 1  0128              DC      XT2                                    SYMBL190
00BC 20 068A3580          LIBF    FSTO                                   SYMBL191
00BD 1  0134              DC      YSYM        YSYM=YSYM-XT2-YT2          SYMBL192
00BE 0  1010              SLA     16                                     SYMBL193
00BF 0  D2F6              STO   2 SWCEN-R                                SYMBL194
00C0 0  7007              MDX     S10                                    SYMBL195
00C1 0  C2F3        S95   LD    2 FACTY-R     TEST IF NECESSARY TO RAISE SYMBL196
00C2 0  92FE              S     2 K16-R       THE PEN                    SYMBL197
00C3 01 4C2800C8          BSC   L S10,+Z                                 SYMBL198
00C5 0  D2F3              STO   2 FACTY-R                                SYMBL199
00C6 0  C2FD              LD    2 K3-R                                   SYMBL200
00C7 0  D2F9              STO   2 I-R                                    SYMBL201
00C8 0  CAC2        S10   LDD   2 XSYM-R                                 SYMBL202
00C9 0  DABE              STD   2 X-R         X=XSYM                     SYMBL203
00CA 0  CAD4              LDD   2 YSYM-R                                 SYMBL204
00CB 0  DAC0              STD   2 Y-R         Y=YSYM                     SYMBL205
                    *                                                    SYMBL206
00CC 20 064C4000          LIBF    FLD         **************************SYMBL207
00CD 1  011E              DC      X                                      SYMBL208
00CE 01 65800152          LDX   I1 FACTX      X=X+INCC*ABSCISSE-         SYMBL209
00D0 20 06044127          LIBF    FADDX          -INCS*ORDINATE          SYMBL210
00D1 1  0124              DC      XTO                                    SYMBL211
00D2 01 65800153          LDX   I1 FACTY      **************************SYMBL212
00D4 20 068A40A7          LIBF    FSUBX                                  SYMBL213
00D5 1  0136              DC      YTO                                    SYMBL214
00D6 20 068A3580          LIBF    FSTO                                   SYMBL215
00D7 1  011E              DC      X                                      SYMBL216
                    *                                                    SYMBL217
00D8 20 064C4000          LIBF    FLD         **************************SYMBL218
00D9 1  0120              DC      Y                                      SYMBL219
00DA 01 65800152          LDX   I1 FACTX      Y=Y+INCS*ABSCISSE+         SYMBL220
00DC 20 06044127          LIBF    FADDX          +INCC*ORDINATE          SYMBL221
00DD 1  0136              DC      YTO                                    SYMBL222
00DE 01 65800153          LDX   I1 FACTY      **************************SYMBL223
00E0 20 06044127          LIBF    FADDX                                  SYMBL224
00E1 1  0124              DC      XTO                                    SYMBL225
00E2 20 068A3580          LIBF    FSTO                                   SYMBL226
00E3 1  0120              DC      Y                                      SYMBL227
                    *                                                    SYMBL228
00E4 30 174D68C0          CALL    PLOT        BRANCH TO PLOT             SYMBL229
00E6 1  011E              DC      X                                      SYMBL230
00E7 1  0120              DC      Y                                      SYMBL231
00E8 1  0159              DC      I                                      SYMBL232
                    *                                                    SYMBL233
00E9 0  6102              LDX   1 2                                      SYMBL234
00EA 01 6D000159          STX   L1 I          I=2                        SYMBL235
00EC 01 74000154          MDX   L END,0       TEST IF LAST COORDINATE    SYMBL236
00EE 0  709B              MDX     S6          NO                         SYMBL237
                    *                                                    SYMBL238
                    *     END OF DESIGNING ONE CHARACTER                 SYMBL239
                    *     SEARCH START POINT FOR NEXT CHARACTER          SYMBL240
                    *                                                    SYMBL241
00EF 0  61DC        S18   LDX   1 -36         XR1=-36                    SYMBL242
00F0 20 064C49C0    S19   LIBF    FLDX                                   SYMBL243
00F1 1  0146              DC      XSYM+36                                SYMBL244
00F2 20 06044127          LIBF    FADDX                                  SYMBL245
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00F3 1  0154                    DC      XT6+36      XSYM=XSYM+XT6                SYMBL246
00F4 20 068A35A7                LIBF    FSTOX                                    SYMBL247
00F5 1  0146                    DC      XSYM+36     YSYM=YSYM+YT6                SYMBL248
00F6 0  7112                    MDX   1 18                                       SYMBL249
00F7 0  70F8                    MDX     S19                                      SYMBL250
00F8 01 74000156                MDX   L SWCEN,0     TEST CENTERED SYMBOL         SYMBL251
00FA 0  7010                    MDX     S21                                      SYMBL252
00FB 20 064C4000                LIBF    FLD                                      SYMBL253
00FC 1  0122                    DC      XSYM                                     SYMBL254
00FD 20 06044100                LIBF    FADD                                     SYMBL255
00FE 1  0128                    DC      XT2                                      SYMBL256
00FF 20 068A4080                LIBF    FSUB                                     SYMBL257
0100 1  013A                    DC      YT2                                      SYMBL258
0101 20 068A3580                LIBF    FSTO                                     SYMBL259
0102 1  0122                    DC      XSYM        XSYM=XSYM+XT2-YT2            SYMBL260
0103 20 064C4000                LIBF    FLD                                      SYMBL261
0104 1  0134                    DC      YSYM                                     SYMBL262
0105 20 06044100                LIBF    FADD                                     SYMBL263
0106 1  0128                    DC      XT2                                      SYMBL264
0107 20 06044100                LIBF    FADD                                     SYMBL265
0108 1  013A                    DC      YT2                                      SYMBL266
0109 20 068A3580                LIBF    FSTO                                     SYMBL267
010A 1  0134                    DC      YSYM        YSYM=YSYM+XT2-YT2            SYMBL268
010B 01 74FF015A    S21         MDX   L ABSN,-1     TEST IF LAST CHARACTER       SYMBL269
010D 0  700E                    MDX     S22         NO                           SYMBL270
                    *                                                            SYMBL271
                    *       END OF DESIGNING ALL CHARACTERS                      SYMBL272
                    *       RETURN XSYM,YSYM TO THE CALLING PROGRAM AS           SYMBL273
                    *       X AND Y IF N NEGATIVE                                SYMBL274
                    *                                                            SYMBL275
010E 01 65800000                LDX   I1 SYMBL      YES                          SYMBL276
0110 00 C5800005                LD    I1 5          SEARCH N                     SYMBL277
0112 01 4C10000E                BSC   L  EXIT,-                                  SYMBL278
0114 0  C80D                    LDD      XSYM                                    SYMBL279
0115 00 DD800000                STD   I1 0                                       SYMBL280
0117 0  C81C                    LDD      YSYM                                    SYMBL281
0118 00 DD800001                STD   I1 1                                       SYMBL282
011A 01 4C00000E                BSC   L  EXIT       BRANCH TO EXIT               SYMBL283
                    *                                                            SYMBL284
011C 01 4C00005D    S22         BSC   L  S3         GO TO S3 FOR NEXT CHARAC.    SYMBL285
                    *                                                            SYMBL286
                    *       CONSTANTS AND WORKAREAS                              SYMBL287
                    *                                                            SYMBL288
011E 00 00000000    X       DEC      0                                           SYMBL289
0120 00 00000000    Y       DEC      0                                           SYMBL290
0122 00 00000000    XSYM    DEC      0                                           SYMBL291
0124 00 00000000    XTO     DEC      0                                           SYMBL292
0126 00 00000000    INCC    DEC      0                                           SYMBL293
0128 00 00000000    XT2     DEC      0                                           SYMBL294
012A 00 00000000            DEC      0                                           SYMBL295
012C 00 00000000            DEC      0                                           SYMBL296
012E 00 00000000            DEC      0                                           SYMBL297
0130 00 00000000    XT6     DEC      0                                           SYMBL298
0132 00 00000000            DEC      0                                           SYMBL299
0134 00 00000000    YSYM    DEC      0                                           SYMBL300
0136 00 00000000    YTO     DEC      0                                           SYMBL301
0138 00 00000000    INCS    DEC      0                                           SYMBL302
013A 00 00000000    YT2     DEC      0                                           SYMBL303
013C 00 00000000            DEC      0                                           SYMBL304
013E 00 00000000            DEC      0                                           SYMBL305
0140 00 00000000            DEC      0                                           SYMBL306
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0142 00 00000000          DEC     0                                       SYMBL307
0144 00 00000000          DEC     0                                       SYMBL308
0146 00 00000000  FACT    DEC     0                                       SYMBL309
0148 00 00000000  CHAR    DEC     0                                       SYMBL310
014A 00 00000000  THETA   DEC     0                                       SYMBL311
014C 00 00000000  SIZE    DEC     0                                       SYMBL312
014E 00 4924907E  D1D7    DEC     0.1428571  1/7                          SYMBL313
0150 00 477D177B  D1D57   DEC     0.01745328 1./57.2958                   SYMBL314
0152 0  0000      FACTX   DC      0                                       SYMBL315
0153 0  0000      FACTY   DC      0                                       SYMBL316
0154 0  0000      END     DC      0                                       SYMBL317
0155 0  0000      SWCO    DC      0                                       SYMBL318
0156 0  0000      SWCEN   DC      0                                       SYMBL319
0157 0  0000      SWITC   DC      0                                       SYMBL320
0158 0  0000      EBC     DC      0                                       SYMBL321
0159 0  0000      I       DC      0                                       SYMBL322
015A 0  0000      ABSN    DC      0                                       SYMBL323
015B 0  FFFF      KM1     DC      -1                                      SYMBL324
015C 0  0002      K2      DC      2                                       SYMBL325
015D 0  0003      K3      DC      3                                       SYMBL326
015E 0  0010      K16     DC      16                                      SYMBL327
015F 0  00FF      MASK    DC      /00FF                                   SYMBL328
                  *                                                       SYMBL329
                  *       ADDRESS TABLE FOR COORDINATES OF THE SYMBOLS    SYMBL330
                  *                                                       SYMBL331
                  *                          PRINTER   SYMBOL   CARD      SYMBL332
                  *                           CODE              CODE     SYMBL333
0160 1  019F      TAB     DC      TABLE      01        1                  SYMBL334
0161 1  01A2              DC      TABLE+3    02        2                  SYMBL335
0162 1  01DC              DC      TABLE+61   03        3                  SYMBL336
0163 1  01A7              DC      TABLE+8    04        4                  SYMBL337
0164 1  01AB              DC      TABLE+12   05        5                  SYMBL338
0165 1  01B0              DC      TABLE+17   06        6                  SYMBL339
0166 1  01B6              DC      TABLE+23   07        7                  SYMBL340
0167 1  01DA              DC      TABLE+59   08        8                  SYMBL341
0168 1  01B9              DC      TABLE+26   09        9                  SYMBL342
0169 1  01FA              DC      TABLE+91   0A        0                  SYMBL343
016A 1  0237              DC      TABLE+152  0B        =        6-8       SYMBL344
016B 1  0240              DC      TABLE+161  0C        @        4-8       SYMBL345
016C 1  0243              DC      TABLE+164  0D        '        5-8       SYMBL346
016D 1  0244              DC      TABLE+165  0E                  0-6-8     SYMBL347
016E 1  0246              DC      TABLE+167  0F                  0-8-7     SYMBL348
016F 1  0221              DC      TABLE+130  10        +                  SYMBL349
0170 1  0220              DC      TABLE+129  11        /                  SYMBL350
0171 1  0204              DC      TABLE+101  12        S                  SYMBL351
0172 1  020B              DC      TABLE+108  13        T                  SYMBL352
0173 1  020D              DC      TABLE+110  14        U                  SYMBL353
0174 1  0210              DC      TABLE+113  15        V                  SYMBL354
0175 1  0212              DC      TABLE+115  16        W                  SYMBL355
0176 1  0215              DC      TABLE+118  17        X                  SYMBL356
0177 1  0219              DC      TABLE+122  18        Y                  SYMBL357
0178 1  021C              DC      TABLE+125  19        Z                  SYMBL358
0179 1  024D              DC      TABLE+174  1A        %        0-4-8     SYMBL359
017A 1  023A              DC      TABLE+155  1B        ,                  SYMBL360
017B 1  0235              DC      TABLE+150  1C        (                  SYMBL361
017C 1  023D              DC      TABLE+158  1D        CEN.SYMB. 0-5-8    SYMBL362
017D 1  0253              DC      TABLE+180  1E        0        2-8       SYMBL363
017E 1  0258              DC      TABLE+185  1F                  7-8     SYMBL364
017F 1  0239              DC      TABLE+154  20        -                  SYMBL365
0180 1  01E9              DC      TABLE+74   21        J                  SYMBL366
0181 1  01EC              DC      TABLE+77   22        K                  SYMBL367
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0182 1 01BF          DC      TABLE+32    23      L                   SYMBL368
0183 1 01EF          DC      TABLE+80    24      M                   SYMBL369
0184 1 01F2          DC      TABLE+83    25      N                   SYMBL370
0185 1 01F4          DC      TABLE+85    26      O                   SYMBL371
0186 1 01CD          DC      TABLE+46    27      P                   SYMBL372
0187 1 01F9          DC      TABLE+90    28      Q                   SYMBL373
0188 1 01FF          DC      TABLE+96    29      R                   SYMBL374
0189 1 025A          DC      TABLE+187   2A      #          3-8      SYMBL375
018A 1 0229          DC      TABLE+138   2B      $                   SYMBL376
018B 1 022F          DC      TABLE+144   2C      *                   SYMBL377
018C 1 025E          DC      TABLE+191   2D      CENT. *    11-2-8   SYMBL378
018D 1 0264          DC      TABLE+197   2E      CENT.SYMB. 11-6-8   SYMBL379
018E 1 0267          DC      TABLE+200   2F      CENT. X    11-7-8   SYMBL380
018F 1 026A          DC      TABLE+203   30      &                   SYMBL381
0190 1 01C5          DC      TABLE+38    31      A                   SYMBL382
0191 1 01CA          DC      TABLE+43    32      B                   SYMBL383
0192 1 01B2          DC      TABLE+19    33      C                   SYMBL384
0193 1 01C1          DC      TABLE+34    34      D                   SYMBL385
0194 1 01D1          DC      TABLE+50    35      E                   SYMBL386
0195 1 01D2          DC      TABLE+51    36      F                   SYMBL387
0196 1 01D5          DC      TABLE+54    37      G                   SYMBL388
0197 1 01E3          DC      TABLE+68    38      H                   SYMBL389
0198 1 01E6          DC      TABLE+71    39      I                   SYMBL390
0199 0 7FFF  MASK1   DC      /7FFF       3A      NOT USED            SYMBL391
019A 1 0224          DC      TABLE+133   3B      .                   SYMBL392
019B 1 0227          DC      TABLE+136   3C      )                   SYMBL393
019C 1 0261          DC      TABLE+194   3D      CENT. +    12-2-8   SYMBL394
019D 1 0270          DC      TABLE+209   3E      )          12-4-8   SYMBL395
019E 1 020C          DC      TABLE+109   3F                  12-7-8   SYMBL396
                     *                                               SYMBL397
                     *       TABLE OF COORDINATES                    SYMBL398
                     *                                               SYMBL399
019F 0 1627  TABLE   DC      /1627       1                           SYMBL400
01A0 0 2010          DC      /2010                                   SYMBL401
01A1 0 B000          DC      /B000                                   SYMBL402
01A2 0 0506          DC      /0506       2                           SYMBL403
01A3 0 1737          DC      /1737                                   SYMBL404
01A4 0 4645          DC      /4645                                   SYMBL405
01A5 0 0100          DC      /0100                                   SYMBL406
01A6 0 C000          DC      /C000                                   SYMBL407
01A7 0 0703          DC      /0703       4                           SYMBL408
01A8 0 4333          DC      /4333                                   SYMBL409
01A9 0 3730          DC      /3730                                   SYMBL410
01AA 0 40A0          DC      /40A0                                   SYMBL411
01AB 0 0201          DC      /0201       5                           SYMBL412
01AC 0 1030          DC      /1030                                   SYMBL413
01AD 0 4143          DC      /4143                                   SYMBL414
01AE 0 3404          DC      /3404                                   SYMBL415
01AF 0 07C7          DC      /07C7                                   SYMBL416
01B0 0 0314          DC      /0314       6                           SYMBL417
01B1 0 3443          DC      /3443                                   SYMBL418
01B2 0 4130          DC      /4130       C                           SYMBL419
01B3 0 1001          DC      /1001                                   SYMBL420
01B4 0 0617          DC      /0617                                   SYMBL421
01B5 0 37C6          DC      /37C6                                   SYMBL422
01B6 0 0607          DC      /0607       7                           SYMBL423
01B7 0 4721          DC      /4721                                   SYMBL424
01B8 0 A000          DC      /A000                                   SYMBL425
01B9 0 0110          DC      /0110       9                           SYMBL426
01BA 0 3041          DC      /3041                                   SYMBL427
01BB 0 4637          DC      /4637                                   SYMBL428
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01BC  0  1706          DC      /1706                    SYMBL429
01BD  0  0413          DC      /0413                    SYMBL430
01BE  0  33C4          DC      /33C4                    SYMBL431
01BF  0  4000          DC      /4000      L             SYMBL432
01C0  0  8700          DC      /8700                    SYMBL433
01C1  0  0007          DC      /0007      D             SYMBL434
01C2  0  3746          DC      /3746                    SYMBL435
01C3  0  4130          DC      /4130                    SYMBL436
01C4  0  8000          DC      /8000                    SYMBL437
01C5  0  0003          DC      /0003      A             SYMBL438
01C6  0  4346          DC      /4346                    SYMBL439
01C7  0  3717          DC      /3717                    SYMBL440
01C8  0  0603          DC      /0603                    SYMBL441
01C9  0  43C0          DC      /43C0                    SYMBL442
01CA  0  0434          DC      /0434      B             SYMBL443
01CB  0  4341          DC      /4341                    SYMBL444
01CC  0  3010          DC      /3010                    SYMBL445
01CD  0  0007          DC      /0007      P             SYMBL446
01CE  0  3746          DC      /3746                    SYMBL447
01CF  0  4534          DC      /4534                    SYMBL448
01D0  0  8400          DC      /8400                    SYMBL449
01D1  0  4000          DC      /4000      E             SYMBL450
01D2  0  0004          DC      /0004      F             SYMBL451
01D3  0  3404          DC      /3404                    SYMBL452
01D4  0  07C7          DC      /07C7                    SYMBL453
01D5  0  3343          DC      /3343      G             SYMBL454
01D6  0  4130          DC      /4130                    SYMBL455
01D7  0  1001          DC      /1001                    SYMBL456
01D8  0  0617          DC      /0617                    SYMBL457
01D9  0  37C6          DC      /37C6                    SYMBL458
01DA  0  0103          DC      /0103      8             SYMBL459
01DB  0  1405          DC      /1405                    SYMBL460
01DC  0  0617          DC      /0617      3             SYMBL461
01DD  0  3746          DC      /3746                    SYMBL462
01DE  0  4534          DC      /4534                    SYMBL463
01DF  0  1434          DC      /1434                    SYMBL464
01E0  0  4341          DC      /4341                    SYMBL465
01E1  0  3010          DC      /3010                    SYMBL466
01E2  0  0182          DC      /0182                    SYMBL467
01E3  0  0007          DC      /0007      H             SYMBL468
01E4  0  0444          DC      /0444                    SYMBL469
01E5  0  47C0          DC      /47C0                    SYMBL470
01E6  0  1737          DC      /1737      I             SYMBL471
01E7  0  2720          DC      /2720                    SYMBL472
01E8  0  3090          DC      /3090                    SYMBL473
01E9  0  0201          DC      /0201      J             SYMBL474
01EA  0  1030          DC      /1030                    SYMBL475
01EB  0  41C7          DC      /41C7                    SYMBL476
01EC  0  0007          DC      /0007      K             SYMBL477
01ED  0  0447          DC      /0447                    SYMBL478
01EE  0  04C0          DC      /04C0                    SYMBL479
01EF  0  0007          DC      /0007      M             SYMBL480
01F0  0  2347          DC      /2347                    SYMBL481
01F1  0  C000          DC      /C000                    SYMBL482
01F2  0  0007          DC      /0007      N             SYMBL483
01F3  0  40C7          DC      /40C7                    SYMBL484
01F4  0  2547          DC      /2547      O             SYMBL485
01F5  0  1706          DC      /1706                    SYMBL486
01F6  0  0110          DC      /0110                    SYMBL487
01F7  0  3041          DC      /3041                    SYMBL488
01F8  0  46B7          DC      /46B7                    SYMBL489
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01F9 0  2240          DC      /2240      Q          SYMBL490
01FA 0  1001          DC      /1001      0          SYMBL491
01FB 0  0617          DC      /0617                 SYMBL492
01FC 0  3746          DC      /3746                 SYMBL493
01FD 0  4130          DC      /4130                 SYMBL494
01FE 0  9000          DC      /9000                 SYMBL495
01FF 0  0007          DC      /0007      '          SYMBL496
0200 0  3746          DC      /3746                 SYMBL497
0201 0  4534          DC      /4534                 SYMBL498
0202 0  0434          DC      /0434                 SYMBL499
0203 0  43C0          DC      /43C0                 SYMBL500
0204 0  0201          DC      /0201      S          SYMBL501
0205 0  1030          DC      /1030                 SYMBL502
0206 0  4143          DC      /4143                 SYMBL503
0207 0  3414          DC      /3414                 SYMBL504
0208 0  0506          DC      /0506                 SYMBL505
0209 0  1737          DC      /1737                 SYMBL506
020A 0  46C5          DC      /46C5                 SYMBL507
020B 0  0747          DC      /0747      T          SYMBL508
020C 0  27A0          DC      /27A0                 SYMBL509
020D 0  0701          DC      /0701      U          SYMBL510
020E 0  1030          DC      /1030                 SYMBL511
020F 0  41C7          DC      /41C7                 SYMBL512
0210 0  0720          DC      /0720      V          SYMBL513
0211 0  C700          DC      /C700                 SYMBL514
0212 0  0700          DC      /0700      W          SYMBL515
0213 0  2340          DC      /2340                 SYMBL516
0214 0  C700          DC      /C700                 SYMBL517
0215 0  0024          DC      /0024      X          SYMBL518
0216 0  0724          DC      /0724                 SYMBL519
0217 0  4724          DC      /4724                 SYMBL520
0218 0  C000          DC      /C000                 SYMBL521
0219 0  2024          DC      /2024      Y          SYMBL522
021A 0  0724          DC      /0724                 SYMBL523
021B 0  C700          DC      /C700                 SYMBL524
021C 0  0747          DC      /0747      Z          SYMBL525
021D 0  2414          DC      /2414                 SYMBL526
021E 0  3424          DC      /3424                 SYMBL527
021F 0  00C0          DC      /00C0                 SYMBL528
0220 0  00C7          DC      /00C7      /          SYMBL529
0221 0  2125          DC      /2125      +          SYMBL530
0222 0  2303          DC      /2303                 SYMBL531
0223 0  C300          DC      /C300                 SYMBL532
0224 0  1030          DC      /1030      .          SYMBL533
0225 0  3212          DC      /3212                 SYMBL534
0226 0  9000          DC      /9000                 SYMBL535
0227 0  0011          DC      /0011      )          SYMBL536
0228 0  1687          DC      /1687                 SYMBL537
0229 0  0232          DC      /0232      $          SYMBL538
022A 0  4334          DC      /4334                 SYMBL539
022B 0  1405          DC      /1405                 SYMBL540
022C 0  1646          DC      /1646                 SYMBL541
022D 0  2627          DC      /2627                 SYMBL542
022E 0  A000          DC      /A000                 SYMBL543
022F 0  3322          DC      /3322      *          SYMBL544
0230 0  1331          DC      /1331                 SYMBL545
0231 0  2212          DC      /2212                 SYMBL546
0232 0  3222          DC      /3222                 SYMBL547
0233 0  2321          DC      /2321                 SYMBL548
0234 0  2291          DC      /2291                 SYMBL549
0235 0  1001          DC      /1001      (          SYMBL550
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0236 0  0697          DC      /0697                                   SYMBL551
0237 0  1434          DC      /1434       =                           SYMBL552
0238 0  1BB3          DC      /1BB3                                   SYMBL553
0239 0  03C3          DC      /03C3       -                           SYMBL554
023A 0  0011          DC      /0011       ,                           SYMBL555
023B 0  1202          DC      /1202                                   SYMBL556
023C 0  0191          DC      /0191                                   SYMBL557
023D 0  0840          DC      /0840       CENT. SYMB.  0-5-8          SYMBL558
023E 0  4404          DC      /4404                                   SYMBL559
023F 0  8000          DC      /8000                                   SYMBL560
0240 0  0014          DC      /0014       PI                          SYMBL561
0241 0  0444          DC      /0444                                   SYMBL562
0242 0  34A0          DC      /34A0                                   SYMBL563
0243 0  2794          DC      /2794       '                           SYMBL564
0244 0  1534          DC      /1534                                   SYMBL565
0245 0  9300          DC      /9300                                   SYMBL566
0246 0  0506          DC      /0506                                   SYMBL567
0247 0  1737          DC      /1737                                   SYMBL568
0248 0  4645          DC      /4645                                   SYMBL569
0249 0  3424          DC      /3424                                   SYMBL570
024A 0  2329          DC      /2329                                   SYMBL571
024B 0  2030          DC      /2030                                   SYMBL572
024C 0  31A1          DC      /31A1                                   SYMBL573
024D 0  0047          DC      /0047       %                           SYMBL574
024E 0  0D25          DC      /0D25                                   SYMBL575
024F 0  2707          DC      /2707                                   SYMBL576
0250 0  0548          DC      /0548                                   SYMBL577
0251 0  4222          DC      /4222                                   SYMBL578
0252 0  20C0          DC      /20C0                                   SYMBL579
0253 0  2131          DC      /2131       0                           SYMBL580
0254 0  3222          DC      /3222                                   SYMBL581
0255 0  212B          DC      /212B                                   SYMBL582
0256 0  3334          DC      /3334                                   SYMBL583
0257 0  24A3          DC      /24A3                                   SYMBL584
0258 0  1527          DC      /1527                                   SYMBL585
0259 0  2DB7          DC      /2DB7                                   SYMBL586
025A 0  0025          DC      /0025       #                           SYMBL587
025B 0  4D20          DC      /4D20                                   SYMBL588
025C 0  4A02          DC      /4A02                                   SYMBL589
025D 0  0BC3          DC      /0BC3                                   SYMBL590
025E 0  0844          DC      /0844       CEN. *                      SYMBL591
025F 0  2204          DC      /2204                                   SYMBL592
0260 0  4022          DC      /4022                                   SYMBL593
0261 0  2824          DC      /2824       CEN. +                      SYMBL594
0262 0  2202          DC      /2202                                   SYMBL595
0263 0  C200          DC      /C200                                   SYMBL596
0264 0  2842          DC      /2842       CEN.SYMB. 11-6-8            SYMBL597
0265 0  2402          DC      /2402                                   SYMBL598
0266 0  A000          DC      /A000                                   SYMBL599
0267 0  0844          DC      /0844       CEN. X                      SYMBL600
0268 0  2240          DC      /2240                                   SYMBL601
0269 0  8400          DC      /8400                                   SYMBL602
026A 0  4014          DC      /4014       &                           SYMBL603
026B 0  1526          DC      /1526                                   SYMBL604
026C 0  3534          DC      /3534                                   SYMBL605
026D 0  0201          DC      /0201                                   SYMBL606
026E 0  1020          DC      /1020                                   SYMBL607
026F 0  C200          DC      /C200                                   SYMBL608
0270 0  3514          DC      /3514       )                           SYMBL609
0271 0  B300          DC      /B300                                   SYMBL610
0160          R       EQU     TAB                                     SYMBL611
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0067                TVLOC EQU     103                    SYMBL612
0272                      END                            SYMBL613

     NO ERRORS IN ABOVE ASSEMBLY.
SYMBL
DUP FUNCTION COMPLETED
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0000     02545083          ENT      BNEBC                                    BNEBC018
0000 0   0000        BNEBC DC       0                                        BNEBC019
0001 0   D87E              STD      VALUE                                    BNEBC020
0002 0   691B              STX   1  X1+1                                     BNEBC021
0003 0   6A1C              STX   2  X2+1                                     BNEBC022
0004 0   6B1D              STX   3  X3+1                                     BNEBC023
0005 01  65800000          LDX   I1 BNEBC                                    BNEBC024
0007 0   C100              LD    1  0                                       BNEBC025
0008 0   D001              STO      C0+1                                    BNEBC026
0009 00  66000000    C0    LDX   L2 *-*                                      BNEBC027
000B 0   63FA              LDX   3  -6                                       BNEBC028
000C 0   C071              LD       BLAN1                                   BNEBC029
000D 0   D200        C15   STO   2  0                                        BNEBC030
000E 0   7201              MDX   2  1                                        BNEBC031
000F 0   7301              MDX   3  1                                        BNEBC032
0010 0   70FC              MDX      C15                                     BNEBC033
0011 0   C86E              LDD      VALUE                                   BNEBC034
0012 01  4C280025          BSC   L  NEG,+Z                                   BNEBC035
0014 0   B86D              DCM      D0                                      BNEBC036
0015 0   701A              MDX      C3                                      BNEBC037
0016 0   7019              MDX      C3                                      BNEBC038
0017 0   C065              LD       NULL                                    BNEBC039
0018 01  6580000A    C2    LDX   I1 C1                                       BNEBC040
001A 0   D105              STO   1  5                                        BNEBC041
                   *                                                        BNEBC042
001B 01  74010000    EXIT  MDX   L  BNEBC,1                                  BNEBC043
001D 00  65000000    X1    LDX   L1 *-*                                      BNEBC044
001F 00  66000000    X2    LDX   L2 *-*                                      BNEBC045
0021 00  67000000    X3    LDX   L3 *-*                                      BNEBC046
0023 01  4C800000          BSC   I  BNEBC                                    BNEBC047
                   *                                                        BNEBC048
0025 0   F055        NEG   EOR      MIN1                                    BNEBC049
0026 0   D059              STO      VALUE                                   BNEBC050
0027 0   1090              SLT      16                                      BNEBC051
0028 0   F052              EOR      MIN1                                    BNEBC052
0029 0   D057              STO      VALUE+1                                 BNEBC053
002A 0   C855              LDD      VALUE                                   BNEBC054
002B 0   8858              AD       TAB                                     BNEBC055
002C 0   D853              STD      VALUE                                   BNEBC056
002D 0   C04E              LD       MINUS                                   BNEBC057
002E 0   D04B              STO      SIGN                                    BNEBC058
002F 0   7002              MDX      C4                                      BNEBC059
0030 0   C04D        C3    LD       BLAN1                                   BNEBC060
0031 0   D048              STO      SIGN                                    BNEBC061
                   *                                                        BNEBC062
```

```
*****************************************************  BNEBC002
*  IBM 1800 SUBROUTINES FOR CALCOMP 506/570.        *  BNEBC003
*****************************************************  BNEBC004
*                                                   *  BNEBC005
*  SUBROUTINE BNEBC                                 *  BNEBC006
*                                                   *  BNEBC007
*  CALLING SEQUENCE  (ONLY ASSEMBLER)               *  BNEBC008
*  ----------------                                 *  BNEBC009
*     CALL    BNEBC                                 *  BNEBC010
*     DC      DEST        START OF A FIELD OF 6 POS*  BNEBC011
*                         THE DOUBLE PREC. NO. IN   *  BNEBC012
*                         ACC. AND Q-REG. IS CONV.  *  BNEBC013
*                         TO EBCDIC AND MOVED TO    *  BNEBC014
*                         DEST TO DEST+5            *  BNEBC015
*                                                   *  BNEBC016
*****************************************************  BNEBC017
```

```
0032 0  6846          C4    STX      SWTC                BNEBC063
0033 0  6844                STX      SWFIR               BNEBC064
0034 01 7401000A            MDX   L  C1,1               BNEBC065
0036 0  6214                LDX    2 20                 BNEBC066
0037 0  6100          C6    LDX    1 0                  BNEBC067
0038 0  C847                LDD      VALUE              BNEBC068
0039 01 9E000082      C7    SD    L2 TAB-2              BNEBC069
003B 01 4C28003F            BSC   L  C8,+Z              BNEBC070
003D 0  7101                MDX    1 1                  BNEBC071
003E 0  70FA                MDX      C7                 BNEBC072
003F 01 8E000082      C8    AD    L2 TAB-2              BNEBC073
0041 0  D83E                STD      VALUE              BNEBC074
0042 0  6934                STX    1 SAVE1              BNEBC075
0043 0  C033                LD       SAVE1              BNEBC076
0044 01 4C20004D            BSC   L  C95,Z              BNEBC077
0046 01 74000078            MDX   L  SWFIR,0            BNEBC078
0048 0  7002                MDX      C9                 BNEBC079
0049 0  E835                OR       X00F0              BNEBC080
004A 0  7019                MDX      C10                BNEBC081
004B 0  C032          C9    LD       BLAN1              BNEBC082
004C 0  7017                MDX      C10                BNEBC083
004D 0  E831          C95   OR       X00F0              BNEBC084
004E 01 74000078            MDX   L  SWFIR,0            BNEBC085
0050 0  7001                MDX      *+1                BNEBC086
0051 0  7012                MDX      C10                BNEBC087
0052 0  6300                LDX    3 0                  BNEBC088
0053 0  6B24                STX    3 SWFIR              BNEBC089
0054 0  D022                STO      SAVE1              BNEBC090
0055 0  C024                LD       SIGN               BNEBC091
0056 01 74000079            MDX   L  SWTC,0             BNEBC092
0058 0  7004                MDX      C96                BNEBC093
0059 0  1008                SLA      8                  BNEBC094
005A 01 D480000A            STO   I  C1                 BNEBC095
005C 0  7006                MDX      C97                BNEBC096
005D 01 74FF000A      C96   MDX   L  C1,-1              BNEBC097
005F 01 D480000A            STO   I  C1                 BNEBC098
0061 01 7401000A            MDX   L  C1,1               BNEBC099
0063 0  C013          C97   LD       SAVE1              BNEBC100
0064 01 74000079      C10   MDX   L  SWTC,0             BNEBC101
0066 0  7008                MDX      C11                BNEBC102
0067 01 EC80000A            OR    I  C1                 BNEBC103
0069 01 D480000A            STO   I  C1                 BNEBC104
006B 01 7401000A            MDX   L  C1,1               BNEBC105
006D 0  680B                STX      SWTC               BNEBC106
006E 0  7005                MDX      C12                BNEBC107
006F 0  1008          C11   SLA      8                  BNEBC108
0070 01 D480000A            STO   I  C1                 BNEBC109
0072 0  1010                SLA      16                 BNEBC110
0073 0  D005                STO      SWTC               BNEBC111
0074 0  72FE          C12   MDX    2 -2                 BNEBC112
0075 0  70C1                MDX      C6                 BNEBC113
0076 0  70A4                MDX      EXIT               BNEBC114
0077 0  0000          SAVE1 DC       0                  BNEBC115
0078 0  0000          SWFIR DC       0                  BNEBC116
0079 0  0000          SWTC  DC       0                  BNEBC117
007A 0  0000          SIGN  DC       0                  BNEBC118
007B 0  FFFF          MIN1  DC       /FFFF              BNEBC119
007C 0  4060          MINUS DC       /4060              BNEBC120
007D 0  40F0          NULL  DC       /40F0              BNEBC121
007E 0  4040          BLAN1 DC       /4040              BNEBC122
007F 0  00F0          X00F0 DC       /00F0              BNEBC123
```

```
0080 00 00000000    VALUE DEC     0                    BNEBC124
0082 00 00000000    D0    DEC     0                    BNEBC125
0084 00 00000001    TAB   DEC     1                    BNEBC126
0086 00 0000000A          DEC     10                   BNEBC127
0088 00 00000064          DEC     100                  BNEBC128
008A 00 000003E8          DEC     1000                 BNEBC129
008C 00 00002710          DEC     10000                BNEBC130
008E 00 000186A0          DEC     100000               BNEBC131
0090 00 000F4240          DEC     1000000              BNEBC132
0092 00 00989680          DEC     10000000             BNEBC133
0094 00 05F5E100          DEC     100000000            BNEBC134
0096 00 3B9ACA00          DEC     1000000000           BNEBC135
000A              C1      EQU     C0+1                 BNEBC136
0098                      END                          BNEBC137
```

NO ERRORS IN ABOVE ASSEMBLY.

BNEBC
DUP FUNCTION COMPLETED

```
                        ********************************************************* NUMBR002
                        *  IBM 1800 SUBROUTINES FOR CALCOMP 506/570.            * NUMBR003
                        ********************************************************* NUMBR004
                        *                                                       * NUMBR005
                        *  SUBROUTINE NUMBR                                     * NUMBR006
                        *                                                       * NUMBR007
                        *  CALLING SEQUENCE                                     * NUMBR008
                        *  ----------------                                     * NUMBR009
                        *                                                       * NUMBR010
                        *  1.FORTRAN                                            * NUMBR011
                        *    CALL NUMBR(X,Y,SIZE,THETA,FLOAT,N)                 * NUMBR012
                        *  2.ASSEMBLER                                          * NUMBR013
                        *    CALL     NUMBR                                     * NUMBR014
                        *    DC       X          X-COORDINATE                   * NUMBR015
                        *    DC       Y          Y-COORDINATE                   * NUMBR016
                        *    DC       SIZE       SIZE OF DESIGNED NUMBER        * NUMBR017
                        *    DC       THETA      ANGLE TO POS. X-DIRECTION      * NUMBR018
                        *    DC       FLOAT      FLOATING POINT NUMBER          * NUMBR019
                        *    DC       N          NUMBER OF DECIMAL POSIT.       * NUMBR020
                        *                                                       * NUMBR021
                        ********************************************************* NUMBR022
0000     15914099               ENT      NUMBR                                  NUMBR023
0000 0   0000           NUMBR  DC       0                                      NUMBR024
0001 0   697E                   STX   1  X1+1                                   NUMBR025
0002 01  65800000               LDX   I1 NUMBR                                  NUMBR026
0004 0   6A7D                   STX   2  X2+1                                   NUMBR027
0005 0   6B7E                   STX   3  X3+1                                   NUMBR028
0006 00  67800067               LDX   I3 TVLOC                                  NUMBR029
0008 0   C100                   LD    1  0                                      NUMBR030
0009 0   D06D                   STO      X                                      NUMBR031
000A 0   C101                   LD    1  1                                      NUMBR032
000B 0   D06C                   STO      Y                                      NUMBR033
000C 0   C102                   LD    1  2                                      NUMBR034
000D 0   D06B                   STO      SIZE                                   NUMBR035
000E 0   C103                   LD    1  3                                      NUMBR036
000F 0   D06A                   STO      THETA                                  NUMBR037
0010 00  C5800005               LD    I1 5                                      NUMBR038
0012 0   D074                   STO      N                                      NUMBR039
0013 00  CD800004               LDD   I1 4                                      NUMBR040
0015 0   D87A                   STD      VALUE                                  NUMBR041
0016 01  4C10001A               BSC   L  N0,-                                   NUMBR042
0018 0   C871                   LDD      D10E5                                  NUMBR043
0019 0   7001                   MDX      N05                                    NUMBR044
001A 0   C871           N0     LDD      D10E6                                  NUMBR045
001B 0   D876           N05    STD      CON                                    NUMBR046
                        *                                                       NUMBR047
001C 20  064C4000               LIBF     FLD                                    NUMBR048
001D 1   0090                   DC       VALUE                                  NUMBR049
001E 20  06517A00               LIBF     FMPY                                   NUMBR050
001F 1   009C                   DC       D1AR                                   NUMBR051
0020 20  068A3580               LIBF     FSTO                                   NUMBR052
0021 1   0090                   DC       VALUE                                  NUMBR053
0022 30  060654C0               CALL     FAVL                                   NUMBR054
0024 20  068A4080               LIBF     FSUB                                   NUMBR055
0025 1   0092                   DC       CON                                    NUMBR056
0026 20  068A3580               LIBF     FSTO                                   NUMBR057
0027 1   0092                   DC       CON                                    NUMBR058
0028 0   C069                   LD       CON                                    NUMBR059
0029 01  4C280030               BSC   L  N1,+Z                                  NUMBR060
002B 0   C075                   LD       AST                                    NUMBR061
002C 0   D067                   STO      EBC                                    NUMBR062
```

```
002D 0  C078           LD     K2                                NUMBR063
002E 0  D058           STO    N                                 NUMBR064
002F 0  7045           MDX    N5                                NUMBR065
0030 20 064C4000  N1   LIBF   FLD                               NUMBR066
0031 1  0090           DC     VALUE                             NUMBR067
0032 20 05246267       LIBF   EIFIX                             NUMBR068
0033 0  D85E           STD    CON                               NUMBR069
0034 20 051938C0       LIBF   EFLT                              NUMBR070
0035 20 06882640       LIBF   FSBR                              NUMBR071
0036 1  0090           DC     VALUE                             NUMBR072
0037 30 060654C0       CALL   FAVL                              NUMBR073
0039 20 06517A00       LIBF   FMPY                              NUMBR074
003A 1  008E           DC     D10E9                             NUMBR075
003B 20 05246267       LIBF   EIFIX                             NUMBR076
003C 30 02545083       CALL   BNEBC                             NUMBR077
003E 1  0096           DC     EBC+2                             NUMBR078
003F 0  62FB           LDX    2 -5       INSERT ZEROES          NUMBR079
0040 01 C600009C  N2   LD     L2 EBC+8                          NUMBR080
0042 0  E861           OR     NULL                              NUMBR081
0043 01 D600009C       STO    L2 EBC+8                          NUMBR082
0045 0  7201           MDX    2 1                               NUMBR083
0046 0  70F9           MDX    N2                                NUMBR084
                  *                                            NUMBR085
0047 0  C04F           LD     EBC+3      INSERT DECIMAL POINT   NUMBR086
0048 0  E059           AND    MASK                              NUMBR087
0049 0  E855           OR     PKT                               NUMBR088
004A 0  D04C           STO    EBC+3                             NUMBR089
                  *                                            NUMBR090
004B 0  C846           LDD    CON                               NUMBR091
004C 0  B83B           DCM    DO                                NUMBR092
004D 0  7007           MDX    N25                               NUMBR093
004E 0  7006           MDX    N25                               NUMBR094
004F 0  C040           LD     VALUE                             NUMBR095
0050 01 4C100054       BSC    L  N24,-                          NUMBR096
0052 0  1010           SLA    16                                NUMBR097
0053 0  D053           STO    IND                               NUMBR098
0054 0  C83D      N24  LDD    CON                               NUMBR099
0055 30 02545083  N25  CALL   BNEBC                             NUMBR100
0057 1  0091           DC     EBC-3                             NUMBR101
0058 01 740000A7       MDX    L  IND,0                          NUMBR102
005A 0  7003           MDX    N29                               NUMBR103
005B 0  684B           STX    IND                               NUMBR104
005C 0  C041           LD     MINUL                             NUMBR105
005D 0  D038           STO    EBC+2                             NUMBR106
                  *                                            NUMBR107
005E 01 74070087  N29  MDX    L  N,7     INCREMENT N BY 9       NUMBR108
0060 0  62FB           LDX    2 -5       PERFORM A SHIFT PROCEDURE NUMBR109
0061 0  C032      N3   LD     EBC        IF THERE ARE LEADING   NUMBR110
0062 0  E040           AND    MASK1      BLANKS.                NUMBR111
0063 0  903C           S      BLANK                             NUMBR112
0064 01 4C200075       BSC    L  N5,Z                           NUMBR113
0066 0  61F8           LDX    1 -8                              NUMBR114
0067 01 C500009D  N4   LD     L1 EBC+9                          NUMBR115
0069 0  1890           SRT    16                                NUMBR116
006A 01 C500009C       LD     L1 EBC+8                          NUMBR117
006C 0  1088           SLT    8                                 NUMBR118
006D 01 D500009C       STO    L1 EBC+8                          NUMBR119
006F 0  7101           MDX    1 1                               NUMBR120
0070 0  70F6           MDX    N4         FOR EACH SHIFT PROCEDURE NUMBR121
0071 01 74FF0087       MDX    L  N,-1    N IS DECREMENTED BY ONE NUMBR122
0073 0  7201           MDX    2 1                               NUMBR123
```

```
0074 0  70EC              MDX     N3                                  NUMBR124
                     *                                              NUMBR125
0075 30 22A14093     N5   CALL    SYMBL                               NUMBR126
0077 0  0000         X    DC      *-*                                 NUMBR127
0078 0  0000         Y    DC      *-*                                 NUMBR128
0079 0  0000         SIZE DC      *-*                                 NUMBR129
007A 0  0000         THETA DC     *-*                                 NUMBR130
007B 1  0094              DC      EBC                                 NUMBR131
007C 1  0087              DC      N                                   NUMBR132
                     *                                              NUMBR133
007D 01 74060000     EXIT MDX  L  NUMBR,6                             NUMBR134
007F 00 65000000     X1   LDX  L1 *-*                                 NUMBR135
0081 00 66000000     X2   LDX  L2 *-*                                 NUMBR136
0083 00 67000000     X3   LDX  L3 *-*                                 NUMBR137
0085 01 4C800000          BSC  I  NUMBR       RETURN                  NUMBR138
                     *                                              NUMBR139
0087 0  0000         N    DC      0                                   NUMBR140
0088 00 00000000     D0   DEC     0                                   NUMBR141
008A 00 61A80091     D10E5 DEC    1.E5                                NUMBR142
008C 00 7A120094     D10E6 DEC    1.E6                                NUMBR143
008E 00 7735949E     D10E9 DEC    1.E9                                NUMBR144
0090 00 00000000     VALUE DEC    0                                   NUMBR145
0092 00 00000000     CON  DEC     0                                   NUMBR146
0094    0008         EBC  BSS     8                                   NUMBR147
009C 0  4000         D1AR DC      /4000                               NUMBR148
009D 0  0181              DC      /0181                               NUMBR149
009E 0  60F0         MINUL DC     /60F0                               NUMBR150
009F 0  4B00         PKT  DC      /4B00                               NUMBR151
00A0 0  4000         BLANK DC     /4000                               NUMBR152
00A1 0  5C5C         AST  DC      /5C5C                               NUMBR153
00A2 0  00FF         MASK DC      /00FF                               NUMBR154
00A3 0  FF00         MASK1 DC     /FF00                               NUMBR155
00A4 0  F0F0         NULL DC      /F0F0                               NUMBR156
00A5 0  0001         K1   DC      1                                   NUMBR157
00A6 0  0002         K2   DC      2                                   NUMBR158
00A7 0  FFFF         IND  DC      /FFFF                               NUMBR159
0067                 TVLOC EQU    103                                 NUMBR160
00A8                      END                                        NUMBR161

     NO ERRORS IN ABOVE ASSEMBLY.
NUMBR
DUP FUNCTION COMPLETED
```

```
                        ************************************************** MXMN0002
                        *  IBM 1800 SUBROUTINES FOR CALCOMP 506/570.     * MXMN0003
                        ************************************************** MXMN0004
                        *                                                * MXMN0005
                        *  SUBROUTINE MXMN                               * MXMN0006
                        *                                                * MXMN0007
                        *  CALLING SEQUENCE                              * MXMN0008
                        *  ----------------                              * MXMN0009
                        *  1.FORTRAN                                     * MXMN0010
                        *    CALL MXMN(Y,N,K,YMAX,YMIN)                  * MXMN0011
                        *  2.ASSEMBLER                                   * MXMN0012
                        *    CALL    MXMN                                * MXMN0013
                        *    DC      Y          MATRIX Y                 * MXMN0014
                        *    DC      N          NUMBER OF VALUES         * MXMN0015
                        *    DC      K          STEP IN MATRIX Y         * MXMN0016
                        *    DC      YMAX       MAXIMUM VALUE            * MXMN0017
                        *    DC      YMIN       MINIMUM VALUE            * MXMN0018
                        *                                                * MXMN0019
                        ************************************************** MXMN0020
0000     149D4540       ENT     MXMN                                      MXMN0021
0000 0   0000     MXMN  DC      0                                         MXMN0022
0001 0   6969          STX   1 X1+1                                      MXMN0023
0002 0   6A6A          STX   2 X2+1                                      MXMN0024
0003 0   6B6B          STX   3 X3+1                                      MXMN0025
0004 01  65800000      LDX   I1 MXMN                                     MXMN0026
0006 00  CD800000      LDD   I1 0          SEARCH FIRST VALUE            MXMN0027
0008 00  DD800003      STD   I1 3                                        MXMN0028
000A 00  DD800004      STD   I1 4                                        MXMN0029
000C 0   C100          LD    1 0                                         MXMN0030
000D 0   D001          STO     *+1                                       MXMN0031
000E 00  67000000      LDX   L3 *-*                                      MXMN0032
0010 00  C5800001      LD    I1 1                                        MXMN0033
0012 01  4C080068      BSC   L  EXIT,+                                   MXMN0034
0014 0   D001          STO     *+1                                       MXMN0035
0015 00  66000000      LDX   L2 *-*        XR2 HAS N                     MXMN0036
0017 0   72FF          MDX   2 -1                                        MXMN0037
0018 0   7001          MDX     M1                                        MXMN0038
0019 0   704E          MDX     EXIT                                      MXMN0039
001A 0   4060     M1    BSI     EXMAN                                     MXMN0040
001B 0   C05C          LD      EV                                        MXMN0041
001C 0   D05D          STO     EMIN                                      MXMN0042
001D 0   D05B          STO     EMAX                                      MXMN0043
001E 0   C853          LDD     MV                                        MXMN0044
001F 0   D856          STD     MMIN                                      MXMN0045
0020 0   D853          STD     MMAX                                      MXMN0046
0021 0   1010          SLA     16                                        MXMN0047
0022 00  95800002      S     I1 2                                        MXMN0048
0024 0   1001          SLA     1                                         MXMN0049
0025 0   D001          STO     M2+1                                      MXMN0050
0026 00  77000000  M2    MDX   L3 *-*                                    MXMN0051
0028 0   4052          BSI     EXMAN                                     MXMN0052
0029 0   C048          LD      MV                                        MXMN0053
002A 01  4C28004A      BSC   L  M20,+Z                                   MXMN0054
002C 0   C047          LD      MMAX                                      MXMN0055
002D 01  4C100031      BSC   L  M4,-                                     MXMN0056
002F 0   4055     M3    BSI     MAX                                       MXMN0057
0030 0   700A          MDX     M10                                       MXMN0058
0031 0   C046     M4    LD      EV                                        MXMN0059
0032 0   9046          S       EMAX                                      MXMN0060
0033 01  4C30002F      BSC   L  M3,-Z                                    MXMN0061
0035 01  4C20003B      BSC   L  M10,Z                                    MXMN0062
```

```
0037 0  C83A          LDD     MV                  MXMN0063
0038 0  983B          SD      MMAX                MXMN0064
0039 01 44100085      BSI   L MAX,-               MXMN0065
003B 0  C03A      M10 LD      MMIN                MXMN0066
003C 01 4C280066      BSC   L M40,+Z              MXMN0067
003E 0  C039          LD      EV                  MXMN0068
003F 0  903A          S       EMIN                MXMN0069
0040 01 4C300066      BSC   L M40,-Z              MXMN0070
0042 01 4C200048      BSC   L M15,Z               MXMN0071
0044 0  C82D          LDD     MV                  MXMN0072
0045 0  9830          SD      MMIN                MXMN0073
0046 01 4C100066      BSC   L M40,-               MXMN0074
0048 0  4046      M15 BSI     MIN                 MXMN0075
0049 0  701C          MDX     M40                 MXMN0076
                  *                               MXMN0077
004A 0  C02B      M20 LD      MMIN                MXMN0078
004B 01 4C100057      BSC   L M25,-               MXMN0079
004D 0  C02A          LD      EV                  MXMN0080
004E 0  902B          S       EMIN                MXMN0081
004F 01 4C300057      BSC   L M25,-Z              MXMN0082
0051 01 4C200058      BSC   L M30,Z               MXMN0083
0053 0  C81E          LDD     MV                  MXMN0084
0054 0  9821          SD      MMIN                MXMN0085
0055 01 4C100058      BSC   L M30,-               MXMN0086
0057 0  4037      M25 BSI     MIN                 MXMN0087
0058 0  C01B      M30 LD      MMAX                MXMN0088
0059 01 4C100066      BSC   L M40,-               MXMN0089
005B 0  C01C          LD      EV                  MXMN0090
005C 0  901C          S       EMAX                MXMN0091
005D 01 4C280065      BSC   L M35,+Z              MXMN0092
005F 01 4C200066      BSC   L M40,Z               MXMN0093
0061 0  C810          LDD     MV                  MXMN0094
0062 0  9813          SD      MMIN                MXMN0095
0063 01 4C280066      BSC   L M40,+Z              MXMN0096
0065 0  401F      M35 BSI     MAX                 MXMN0097
                  *                               MXMN0098
0066 0  72FF      M40 MDX   2 -1                  MXMN0099
0067 0  70BE          MDX     M2                  MXMN0100
0068 01 74050000  EXIT MDX  L MXMN,5              MXMN0101
006A 00 65000000  X1  LDX  L1 *-*                 MXMN0102
006C 00 66000000  X2  LDX  L2 *-*                 MXMN0103
006E 00 67000000  X3  LDX  L3 *-*                 MXMN0104
0070 01 4C800000      BSC   I MXMN                MXMN0105
                  *                               MXMN0106
0072 00 00000000  MV  DEC     0                   MXMN0107
0074 00 00000000  MMAX DEC    0                   MXMN0108
0076 00 00000000  MMIN DEC    0                   MXMN0109
0078 0  0000      EV  DC      0                   MXMN0110
0079 0  0000      EMAX DC     0                   MXMN0111
007A 0  0000      EMIN DC     0                   MXMN0112
                  *                               MXMN0113
007B 0  0000      EXMAN DC    0                   MXMN0114
007C 0  CB00          LDD   3 0                   MXMN0115
007D 0  1098          SLT     24                  MXMN0116
007E 0  1808          SRA     8                   MXMN0117
007F 0  D0F8          STO     EV                  MXMN0118
0080 0  CB00          LDD   3 0                   MXMN0119
0081 0  1888          SRT     8                   MXMN0120
0082 0  D8EF          STD     MV                  MXMN0121
0083 01 4C80007B      BSC   I EXMAN               MXMN0122
                  *                               MXMN0123
```

```
0085 0  0000          MAX   DC       0                MXMN0124
0086 0  CB00                LDD    3 0                MXMN0125
0087 00 DD800003            STD    I1 3               MXMN0126
0089 0  C0EE                LD       EV               MXMN0127
008A 0  D0EE                STO      EMAX             MXMN0128
008B 0  C8E6                LDD      MV               MXMN0129
008C 0  D8E7                STD      MMAX             MXMN0130
008D 01 4C800085            BSC    I MAX              MXMN0131
                      *                                MXMN0132
008F 0  0000          MIN   DC       0                MXMN0133
0090 0  CB00                LDD    3 0                MXMN0134
0091 00 DD800004            STD    I1 4               MXMN0135
0093 0  C0E4                LD       EV               MXMN0136
0094 0  D0E5                STO      EMIN             MXMN0137
0095 0  C8DC                LDD      MV               MXMN0138
0096 0  D8DF                STD      MMIN             MXMN0139
0097 01 4C80008F            BSC    I MIN              MXMN0140
009A                        END                       MXMN0141
```

NO ERRORS IN ABOVE ASSEMBLY.

MXMN
DUP FUNCTION COMPLETED

```
                *****************************************************  MXMNF002
                *  IBM 1800 SUBROUTINES FOR CALCOMP 506/570.        *  MXMNF003
                *****************************************************  MXMNF004
                *                                                   *  MXMNF005
                *  SUBROUTINE MXMNF                                 *  MXMNF006
                *                                                   *  MXMNF007
                *  CALLING SEQUENCE                                 *  MXMNF008
                *  ---------------                                  *  MXMNF009
                *  1.FORTRAN                                        *  MXMNF010
                *     EXTERNAL CALCF                                *  MXMNF011
                *     CALL MXMNF(Y,N,K,YMAX,YMIN,IF,CALCF)          *  MXMNF012
                *  2.ASSEMBLER                                      *  MXMNF013
                *     CALL    MXMNF                                 *  MXMNF014
                *     DC      Y          MATRIX Y                   *  MXMNF015
                *     DC      N          NUMBER OF VALUES           *  MXMNF016
                *     DC      K          STEP IN MATRIX Y           *  MXMNF017
                *     DC      YMAX       MAXIMUM VALUE              *  MXMNF018
                *     DC      YMIN       MINIMUM VALUE              *  MXMNF019
                *     DC      IF         =0 FOR Y STORED AS MATRIX* MXMNF020
                *                        NOT ZERO FOR Y CALCULATED* MXMNF021
                *                        BY SUBROUTINE              *  MXMNF022
                *     CALL    CALCF      NAME OF SUBROUTINE         *  MXMNF023
                *****************************************************  MXMNF024
0000     149D4546          ENT     MXMNF                               MXMNF025
0000 0   0000      MXMNF  DC      0                                    MXMNF026
0001 0   697F             STX   1 XR1+1                                MXMNF027
0002 01  65800000         LDX   I1 MXMNF                               MXMNF028
0004 0   6A7E             STX   2 XR2+1                                MXMNF029
0005 0   6B7F             STX   3 XR3+1                                MXMNF030
0006 00  C5800005         LD    I1 5                                   MXMNF031
0008 0   D07F             STO     IF                                   MXMNF032
0009 01  4C200018         BSC   L  M0,Z                                MXMNF033
000B 0   C100             LD    1 0                                    MXMNF034
000C 0   D001             STO     *+1                                  MXMNF035
000D 00  67000000         LDX   L3 *-*                                 MXMNF036
000F 0   1010             SLA     16                                   MXMNF037
0010 00  95800002         S     I1 2                                   MXMNF038
0012 0   1001             SLA     1                                    MXMNF039
0013 0   D025             STO     M4+1                                 MXMNF040
0014 00  CD800000         LDD   I1 0                                   MXMNF041
0016 0   D87D             STD     Y                                    MXMNF042
0017 0   7008             MDX     M1                                   MXMNF043
0018 0   C106      M0     LD    1 6                                    MXMNF044
0019 0   D07F             STO     CALC1                                MXMNF045
001A 0   C107             LD    1 7                                    MXMNF046
001B 0   D07E             STO     CALC2                                MXMNF047
001C 0   C070             LD      K1                                   MXMNF048
001D 0   D06E             STO     N1                                   MXMNF049
001E 0   4077             BSI     CALC                                 MXMNF050
001F 0   C874             LDD     Y                                    MXMNF051
0020 00  DD800003  M1     STD   I1 3                                   MXMNF052
0022 00  DD800004         STD   I1 4                                   MXMNF053
0024 00  C5800001         LD    I1 1                                   MXMNF054
0026 01  4C08007E         BSC   L  EXIT,+                              MXMNF055
0028 0   D001             STO     *+1                                  MXMNF056
0029 00  66000000         LDX   L2 *-*                                 MXMNF057
002B 0   72FF             MDX   2 -1                                   MXMNF058
002C 0   7001             MDX     M2                                   MXMNF059
002D 0   7050             MDX     EXIT                                 MXMNF060
002E 0   4077      M2     BSI     EXMAN                                MXMNF061
002F 0   C059             LD      EV                                   MXMNF062
```

```
0030 0  D05A            STO     EMIN            MXMNF063
0031 0  D058            STO     EMAX            MXMNF064
0032 0  C85B            LDD     MV              MXMNF065
0033 0  D85E            STD     MMIN            MXMNF066
0034 0  D85B            STD     MMAX            MXMNF067
0035 01 74000088  M3    MDX  L  IF,0            MXMNF068
0037 0  7005            MDX     M5              MXMNF069
0038 00 77000000  M4    MDX  L3 *-*             MXMNF070
003A 0  CB00            LDD   3 0               MXMNF071
003B 0  D858            STD     Y               MXMNF072
003C 0  7001            MDX     M6              MXMNF073
003D 0  4058      M5    BSI     CALC            MXMNF074
003E 0  4067      M6    BSI     EXMAN           MXMNF075
003F 0  C04E            LD      MV              MXMNF076
0040 01 4C280060        BSC  L  M20,+Z          MXMNF077
0042 0  C04D            LD      MMAX            MXMNF078
0043 01 4C100047        BSC  L  M8,-            MXMNF079
0045 0  406A      M7    BSI     MAX             MXMNF080
0046 0  700A            MDX     M10             MXMNF081
0047 0  C041      M8    LD      EV              MXMNF082
0048 0  9041            S       EMAX            MXMNF083
0049 01 4C300045        BSC  L  M7,-Z           MXMNF084
004B 01 4C200051        BSC  L  M10,Z           MXMNF085
004D 0  C840            LDD     MV              MXMNF086
004E 0  9841            SD      MMAX            MXMNF087
004F 01 441000B0        BSI  L  MAX,-           MXMNF088
0051 0  C040      M10   LD      MMIN            MXMNF089
0052 01 4C28007C        BSC  L  M40,+Z          MXMNF090
0054 0  C034            LD      EV              MXMNF091
0055 0  9035            S       EMIN            MXMNF092
0056 01 4C30007C        BSC  L  M40,-Z          MXMNF093
0058 01 4C20005E        BSC  L  M15,Z           MXMNF094
005A 0  C833            LDD     MV              MXMNF095
005B 0  9836            SD      MMIN            MXMNF096
005C 01 4C10007C        BSC  L  M40,-           MXMNF097
005E 0  405B      M15   BSI     MIN             MXMNF098
005F 0  701C            MDX     M40             MXMNF099
                  *                             MXMNF100
0060 0  C031      M20   LD      MMIN            MXMNF101
0061 01 4C10006D        BSC  L  M25,-           MXMNF102
0063 0  C025            LD      EV              MXMNF103
0064 0  9026            S       EMIN            MXMNF104
0065 01 4C30006D        BSC  L  M25,-Z          MXMNF105
0067 01 4C20006E        BSC  L  M30,Z           MXMNF106
0069 0  C824            LDD     MV              MXMNF107
006A 0  9827            SD      MMIN            MXMNF108
006B 01 4C10006E        BSC  L  M30,-           MXMNE109
006D 0  404C      M25   BSI     MIN             MXMNF110
006E 0  C021      M30   LD      MMAX            MXMNE111
006F 01 4C10007C        BSC  L  M40,-           MXMNF112
0071 0  C017            LD      EV              MXMNF113
0072 0  9017            S       EMAX            MXMNF114
0073 01 4C28007B        BSC  L  M35,+Z          MXMNF115
0075 01 4C20007C        BSC  L  M40,Z           MXMNF116
0077 0  C816            LDD     MV              MXMNF117
0078 0  9819            SD      MMIN            MXMNF118
0079 01 4C28007C        BSC  L  M40,+Z          MXMNF119
007B 0  4034      M35   BSI     MAX             MXMNF120
                  *                             MXMNF121
007C 0  72FF      M40   MDX   2 -1              MXMNF122
007D 0  70B7            MDX     M3              MXMNF123
```

```
007E 01 74080000    EXIT  MDX  L  MXMNF,8                    MXMNF124
0080 00 65000000    XR1   LDX  L1 *-*                        MXMNF125
0082 00 66000000    XR2   LDX  L2 *-*                        MXMNF126
0084 00 67000000    XR3   LDX  L3 *-*                        MXMNF127
0086 01 4C800000          BSC  I  MXMNF                      MXMNF128
                    *                                        MXMNF129
0088 0  0000        IF    DC       0                         MXMNF130
0089 0  0000        EV    DC       0                         MXMNF131
008A 0  0000        EMAX  DC       0                         MXMNF132
008B 0  0000        EMIN  DC       0                         MXMNF133
008C 0  0000        N1    DC       0                         MXMNF134
008D 0  0001        K1    DC       1                         MXMNF135
008E 00 00000000    MV    DEC      0                         MXMNF136
0090 00 00000000    MMAX  DEC      0                         MXMNF137
0092 00 00000000    MMIN  DEC      0                         MXMNF138
0094 00 00000000    Y     DEC      0                         MXMNF139
                    *                                        MXMNF140
0096 0  0000        CALC  DC       0                         MXMNF141
0097 0  6907              STX  1  *+7                        MXMNF142
0098 0  6A08              STX  2  *+8                        MXMNF143
0099 0  0000        CALC1 DC       *-*      CALL CALCF       MXMNF144
009A 0  0000        CALC2 DC       *-*                       MXMNF145
009B 1  0094              DC       Y                         MXMNF146
009C 1  008C              DC       N1                        MXMNF147
009D 1  0088              DC       IF                        MXMNF148
009E 00 65000000          LDX  L1 *-*                        MXMNF149
00A0 00 66000000          LDX  L2 *-*                        MXMNF150
00A2 01 7401008C          MDX  L  N1,1                       MXMNF151
00A4 01 4C800096          BSC  I  CALC                       MXMNF152
                    *                                        MXMNF153
00A6 0  0000        EXMAN DC       0                         MXMNF154
00A7 0  C8EC              LDD      Y                         MXMNF155
00A8 0  1098              SLT      24                        MXMNF156
00A9 0  1808              SRA      8                         MXMNF157
00AA 0  D0DE              STO      EV                        MXMNF158
00AB 0  C8E8              LDD      Y                         MXMNF159
00AC 0  1888              SRT      8                         MXMNF160
00AD 0  D8E0              STD      MV                        MXMNF161
00AE 01 4C8000A6          BSC  I   EXMAN                     MXMNF162
                    *                                        MXMNF163
00B0 0  0000        MAX   DC       0                         MXMNF164
00B1 0  C8E2              LDD      Y                         MXMNF165
00B2 00 DD800003          STD  I1  3                         MXMNF166
00B4 0  C0D4              LD       EV                        MXMNF167
00B5 0  D0D4              STO      EMAX                      MXMNF168
00B6 0  C8D7              LDD      MV                        MXMNF169
00B7 0  D8D8              STD      MMAX                      MXMNF170
00B8 01 4C8000B0          BSC  I   MAX                       MXMNF171
                    *                                        MXMNF172
00BA 0  0000        MIN   DC       0                         MXMNF173
00BB 0  C8D8              LDD      Y                         MXMNF174
00BC 00 DD800004          STD  I1  4                         MXMNF175
00BE 0  C0CA              LD       EV                        MXMNF176
00BF 0  D0CB              STO      EMIN                      MXMNF177
00C0 0  C8CD              LDD      MV                        MXMNF178
00C1 0  D8D0              STD      MMIN                      MXMNF179
00C2 01 4C8000BA          BSC  I   MIN                       MXMNF180
                    *                                        MXMNF181
00C4                      END                                MXMNF182
```

NO ERRORS IN ABOVE ASSEMBLY.

```
                        ************************************************** MXMNL002
                        *  IBM 1800 SUBROUTINES FOR CALCOMP 506/570.     * MXMNL003
                        ************************************************** MXMNL004
                        *                                                * MXMNL005
                        *  SUBROUTINE MXMNL                              * MXMNL006
                        *                                                * MXMNL007
                        *  CALLING SEQUENCE                              * MXMNL008
                        *  ----------------                              * MXMNL009
                        *  1.FORTRAN                                     * MXMNL010
                        *     CALL MXMNL(Y,N,K,YMAXL,YMINL)              * MXMNL011
                        *  2.ASSEMBLER                                   * MXMNL012
                        *     CALL     MXMNL                             * MXMNL013
                        *     DC       Y          MATRIX                 * MXMNL014
                        *     DC       N          NUMBER OF VALUES       * MXMNL015
                        *     DC       K          STEP IN MATRIX         * MXMNL016
                        *     DC       YMAXL      LOGARITHMUS OF MAX. VALUE* MXMNL017
                        *     DC       YMINL      LOGARITHMUS OF MIN. VALUE* MXMNL018
                        *                                                * MXMNL019
                        ************************************************** MXMNL020
0000     149D4553           ENT      MXMNL                               MXMNL021
0000 0   0000       MXMNL DC       0                                     MXMNL022
0001 0   6929              STX    1 X1+1                                MXMNL023
0002 0   6A2A              STX    2 X2+1                                MXMNL024
0003 0   6B2B              STX    3 X3+1                                MXMNL025
0004 01  66800000          LDX   I2 MXMNL                               MXMNL026
0006 0   C200              LD     2 0                                   MXMNL027
0007 0   D006              STO      Y                                   MXMNL028
0008 0   C201              LD     2 1                                   MXMNL029
0009 0   D005              STO      N                                   MXMNL030
000A 0   C202              LD     2 2                                   MXMNL031
000B 0   D004              STO      K                                   MXMNL032
000C 30  149D4540          CALL     MXMN                                MXMNL033
000E 0   0000        Y     DC       *-*                                 MXMNL034
000F 0   0000        N     DC       *-*                                 MXMNL035
0010 0   0000        K     DC       *-*                                 MXMNL036
0011 1   0032              DC       YMAX                                MXMNL037
0012 1   0034              DC       YMIN                                MXMNL038
0013 00  67800067          LDX   I3 TVLOC                               MXMNL039
                    *                                                   MXMNL040
0015 0   61FC        M1    LDX    1 -4                                  MXMNL041
0016 20  064C49C0          LIBF     FLDX                                MXMNL042
0017 1   0036              DC       YMAX+4                              MXMNL043
0018 20  06044100          LIBF     FADD                                MXMNL044
0019 1   0036              DC       DMN                                 MXMNL045
001A 30  064D5000          CALL     FLN                                 MXMNL046
001C 20  06517A00          LIBF     FMPY                                MXMNL047
001D 1   0038              DC       CON                                 MXMNL048
001E 20  068A35A7          LIBF     FSTOX                               MXMNL049
001F 1   0036              DC       YMAX+4                              MXMNL050
0020 0   7102              MDX    1 2                                   MXMNL051
0021 0   70F4              MDX      M1                                  MXMNL052
                    *                                                   MXMNL053
0022 0   C80F              LDD      YMAX                                MXMNL054
0023 00  DE800003          STD   I2 3                                   MXMNL055
0025 0   C80E              LDD      YMIN                                MXMNL056
0026 00  DE800004          STD   I2 4                                   MXMNL057
0028 01  74050000          MDX   L  MXMNL,5                             MXMNL058
002A 00  65000000    X1    LDX   L1 *-*                                 MXMNL059
002C 00  66000000    X2    LDX   L2 *-*                                 MXMNL060
002E 00  67000000    X3    LDX   L3 *-*                                 MXMNL061
0030 01  4C800000          BSC   I  MXMNL                               MXMNL062
```

```
                         *
0032 00 00000000    YMAX  DEC     0                    MXMNL063
0034 00 00000000    YMIN  DEC     0                    MXMNL064
0036 0  4000        DMN   DC      /4000                MXMNL065
0037 0  0000              DC      /0000                MXMNL066
0038 00 6F2DEC7F    CON   DEC     0.4342945            MXMNL067
0067                TVLOC EQU     103                  MXMNL068
003A                      END                          MXMNL069
                                                       MXMNL070

          NO ERRORS IN ABOVE ASSEMBLY.
MXMNL
DUP FUNCTION COMPLETED
```

```
                *****************************************************  MXMLF002
                *  IBM 1800 SUBROUTINES FOR CALCOMP 506/570.        *  MXMLF003
                *****************************************************  MXMLF004
                *                                                   *  MXMLF005
                *  SUBROUTINE MXMLF                                 *  MXMLF006
                *                                                   *  MXMLF007
                *  CALLING SEQUENCE                                 *  MXMLF008
                *  ----------------                                 *  MXMLF009
                *  1.FORTRAN                                        *  MXMLF010
                *     EXTERNAL CALCF                                *  MXMLF011
                *     CALL MXMLF(Y,N,K,YMAXL,YMINL,IFY,CALCF)       *  MXMLF012
                *  2.ASSEMBLER                                      *  MXMLF013
                *     CALL     MXMNL                                *  MXMLF014
                *     DC       Y          MATRIX                    *  MXMLF015
                *     DC       N          NUMBER OF VALUES          *  MXMLF016
                *     DC       K          STEP IN MATRIX            *  MXMLF017
                *     DC       YMAXL      LOGARITHMUS OF MAX. VALUE*  MXMLF018
                *     DC       YMINL      LOGARITHMUS OF MIN. VALUE*  MXMLF019
                *     DC       IFY         0    Y VALUES STORED AS *  MXMLF020
                *                              MATRIX               *  MXMLF021
                *                           NOT ZERO  Y VALUES ARE  *  MXMLF022
                *                             CALCULATED BY CALCF*  MXMLF023
                *     CALL     CALCF       SUBROUTINE FOR CALCULAT.*  MXMLF024
                *                         OF Y VALUES               *  MXMLF025
                *                                                   *  MXMLF026
                *****************************************************  MXMLF027
0000     149D44C6          ENT      MXMLF                             MXMLF028
0000 0   0000      MXMLF   DC       0                                 MXMLF029
0001 0   6932              STX    1 X1+1                              MXMLF030
0002 0   6A33              STX    2 X2+1                              MXMLF031
0003 0   6B34              STX    3 X3+1                              MXMLF032
0004 01  66800000          LDX    I2 MXMLF                            MXMLF033
0006 0   C200              LD     2 0                                 MXMLF034
0007 0   D00C              STO      Y                                 MXMLF035
0008 0   C201              LD     2 1                                 MXMLF036
0009 0   D00B              STO      N                                 MXMLF037
000A 0   C202              LD     2 2                                 MXMLF038
000B 0   D00A              STO      K                                 MXMLF039
000C 0   C205              LD     2 5                                 MXMLF040
000D 0   D00B              STO      IFY                               MXMLF041
000E 0   C206              LD     2 6                                 MXMLF042
000F 0   D00A              STO      CALL                              MXMLF043
0010 0   C207              LD     2 7                                 MXMLF044
0011 0   D009              STO      CALL+1                            MXMLF045
0012 30  149D4546          CALL     MXMNF                             MXMLF046
0014 0   0000      Y       DC       *-*                               MXMLF047
0015 0   0000      N       DC       *-*                               MXMLF048
0016 0   0000      K       DC       *-*                               MXMLF049
0017 1   003C              DC       YMAX                              MXMLF050
0018 1   003E              DC       YMIN                              MXMLF051
0019 0   0000      IFY     DC       0                                 MXMLF052
001A 0   0000      CALL    DC       *-*                               MXMLF053
001B 0   0000              DC       *-*                               MXMLF054
001C 00  67800067          LDX    I3 TVLOC                            MXMLF055
                   *                                                  MXMLF056
001E 0   61FC              LDX    1 -4                                MXMLF057
001F 20  064C49C0  M1      LIBF     FLDX                              MXMLF058
0020 1   0040              DC       YMAX+4                            MXMLF059
0021 20  06044100          LIBF     FADD                              MXMLF060
0022 1   0040              DC       DMN                               MXMLF061
0023 30  064D5000          CALL     FLN                               MXMLF062
```

```
0025 20 06517A00          LIBF     FMPY                    MXMLF063
0026 1  0042              DC       CON                     MXMLF064
0027 20 068A35A7          LIBF     FSTOX                   MXMLF065
0028 1  0040              DC       YMAX+4                  MXMLF066
0029 0  7102              MDX    1 2                       MXMLF067
002A 0  70F4              MDX      M1                      MXMLF068
                     *                                    MXMLF069
002B 0  C810              LDD      YMAX                    MXMLF070
002C 00 DE800003          STD    I2 3                      MXMLF071
002E 0  C80F              LDD      YMIN                    MXMLF072
002F 00 DE800004          STD    I2 4                      MXMLF073
0031 01 74080000          MDX    L MXMLF,8                 MXMLF074
0033 00 65000000     X1   LDX    L1 *-*                    MXMLF075
0035 00 66000000     X2   LDX    L2 *-*                    MXMLF076
0037 00 67000000     X3   LDX    L3 *-*                    MXMLF077
0039 01 4C800000          BSC    I  MXMLF                  MXMLF078
                     *                                    MXMLF079
003C 00 00000000     YMAX DEC      0                       MXMLF080
003E 00 00000000     YMIN DEC      0                       MXMLF081
0040 0  4000         DMN  DC       /4000                   MXMLF082
0041 0  0000              DC       /0000                   MXMLF083
0042 00 6F2DEC7F     CON  DEC      0.4342945               MXMLF084
0067                 TVLOC EQU     103                     MXMLF085
0044                       END                            MXMLF086
```

NO ERRORS IN ABOVE ASSEMBLY.

MXMLF
DUP FUNCTION COMPLETED

```
*****************************************************
*  IBM 1800 SUBROUTINES FOR CALCOMP 506/570.        *
*****************************************************
*                                                   *
*  SUBROUTINE DXDY/SCALN                            *
*                                                   *
*  CALLING SEQUENCE                                 *
*  ----------------                                 *
*  1.FORTRAN                                        *
*     CALL DXDY(SIZE,YMAX,YMIN,DY,DY1,DL,NEXP)      *
*     CALL SCALN(SIZE,Y,N,K,YMIN,DY,DY1,DL,NEXP)    *
*  2.ASSEMBLER                                      *
*     CALL     DXDY                                 *
*     DC       SIZE        LENGTH OF AXIS           *
*     DC       YMAX        MAX. VALUE               *
*     DC       YMIN        MIN. VALUE               *
*     DC       DY          FUNCT.INCR.AT 1CM OF DES.*
*     DC       DY1         FUNCT.INCR. OF GRADUATION*
*     DC       DL          LENGTH IN CM BETW.2 TICM.*
*     DC       NEXP        EXPONENT OF 10           *
*                                                   *
*     CALL     SCALN                                *
*     DC       SIZE        LENGTH OF AXIS           *
*     DC       Y           MATRIX                   *
*     DC       N           NUMBER OF VALUES         *
*     DC       K         ..                         *
*     DC       YMIN       .                         *
*     DC       DY         .                         *
*     DC       DY1        . SEE DXDY                *
*     DC       DL         .                         *
*     DC       NEXP      ..                         *
*                                                   *
*****************************************************
```

```
002D     049C4A00          ENT     DXDY
0000     220C14D5          ENT     SCALN
0000 0   0000      SCALN   DC      0
0001 01  44000151          BSI  L  SAVE        SAVE INDEX REGISTERS
0003 01  65800000          LDX  I1 SCALN
0005 0   6927              STX   1 DXDY
0006 01  67000157          LDX  L3 R
0008 0   C101              LD    1 1
0009 0   D00F              STO     Y
000A 0   D3E1              STO   3 YY-R
000B 0   D3E7              STO   3 YYY-R
000C 0   C102              LD    1 2
000D 0   D00C              STO     N
000E 0   D3DF              STO   3 NN-R+1
000F 0   C103              LD    1 3
0010 0   D00A              STO     K
0011 00  C5800003          LD   I1 3
0013 0   1001              SLA     1
0014 0   D300              STO   3 KK-R
0015 0   C104              LD    1 4
0016 0   D006              STO     AYMIN
0017 30  149D4540          CALL    MXMN
0019 0   0000      Y       DC      *-*
001A 0   0000      N       DC      *-*
001B 0   0000      K       DC      *-*
001C 1   015E              DC      YMAX
001D 0   0000      AYMIN   DC      *-*
001E 01  6C000158          STX  L  SCAL
```

```
0020 0  C105          LD    1 5                                  DXDY0063
0021 01 D40000D3      STO   L ADY+1                              DXDY0064
0023 01 D400013C      STO   L DYY                                DXDY0065
0025 0  C106          LD    1 6                                  DXDY0066
0026 01 D40000D9      STO   L ADY1+1                             DXDY0067
0028 0  C107          LD    1 7                                  DXDY0068
0029 01 D40000DF      STO   L ADL+1                              DXDY0069
002B 0  C108          LD    1 8                                  DXDY0070
002C 0  7015          MDX     DXDY0                              DXDY0071
002D 0  0000    DXDY  DC      0                                  DXDY0072
002E 01 44000151      BSI   L SAVE                               DXDY0073
0030 01 6580002D      LDX   I1 DXDY                              DXDY0074
0032 00 CD800001      LDD   I1 1           YMAX                  DXDY0075
0034 01 DC00015E      STD   L YMAX                               DXDY0076
0036 0  C102          LD    1 2                                  DXDY0077
0037 0  D0E5          STO     AYMIN        ADDRESS YMIN          DXDY0078
0038 0  C103          LD    1 3                                  DXDY0079
0039 01 D40000D3      STO   L ADY+1                              DXDY0080
003B 0  C104          LD    1 4                                  DXDY0081
003C 01 D40000D9      STO   L ADY1+1                             DXDY0082
003E 0  C105          LD    1 5                                  DXDY0083
003F 01 D40000DF      STO   L ADL+1                              DXDY0084
0041 0  C106          LD    1 6                                  DXDY0085
0042 01 D4000159  DXDY0 STO   L ANEXP                            DXDY0086
0044 00 67800067      LDX   I3 TVLOC                             DXDY0087
0046 01 CC80001D      LDD   I AYMIN                              DXDY0088
0048 01 DC00015C      STD   L YMIN                               DXDY0089
004A 00 CD800000      LDD   I1 0                                 DXDY0090
004C 01 DC000166      STD   L SIZE                               DXDY0091
004E 00 66800068  DXDY1 LDX   I2 LWA                             DXDY0092
0050 0  1010          SLA     16                                 DXDY0093
0051 0  D239          STO   2 57                                 DXDY0094
0052 20 064C4000      LIBF    FLD                                DXDY0095
0053 1  015E          DC      YMAX                               DXDY0096
0054 20 068A4080      LIBF    FSUB                               DXDY0097
0055 1  015C          DC      YMIN                               DXDY0098
0056 20 068A3580      LIBF    FSTO                               DXDY0099
0057 1  0160          DC      DELTA                              DXDY0100
0058 01 CC000160      LDD   L DELTA                              DXDY0101
005A 01 BC0001B8      DCM   L DOP                                DXDY0102
005C 0  7003          MDX     *+3                                DXDY0103
005D 0  7002          MDX     *+2                                DXDY0104
005E 01 4C00010C      BSC   L DZERO                              DXDY0105
0060 20 064C4000      LIBF    FLD                                DXDY0106
0061 1  015E          DC      YMAX                               DXDY0107
0062 20 06044100      LIBF    FADD                               DXDY0108
0063 1  015C          DC      YMIN                               DXDY0109
0064 30 060654C0      CALL    FAVL                               DXDY0110
0066 20 06044100      LIBF    FADD                               DXDY0111
0067 1  0160          DC      DELTA                              DXDY0112
0068 20 06517A00      LIBF    FMPY                               DXDY0113
0069 1  01BC          DC      DP5                                DXDY0114
006A 20 06109940      LIBF    FDIV                               DXDY0115
006B 1  0160          DC      DELTA                              DXDY0116
006C 0  C239          LD    2 57                                 DXDY0117
006D 01 4C20010C      BSC   L DZERO,Z                            DXDY0118
006F 20 068A3580      LIBF    FSTO                               DXDY0119
0070 1  0162          DC      SAVE1                              DXDY0120
0071 20 068A4080      LIBF    FSUB                               DXDY0121
0072 1  01CA          DC      D10E7                              DXDY0122
0073 20 068A3580      LIBF    FSTO                               DXDY0123
```

```
0074 1  0164                    DC      SAVE2                   DXDY0124
0075 01 CC000164                LDD  L  SAVE2                   DXDY0125
0077 01 4C10010C                BSC  L  DZERO,-                 DXDY0126
0079 20 064C4000                LIBF    FLD                     DXDY0127
007A 1  0162                    DC      SAVE1                   DXDY0128
007B 20 06517A00                LIBF    FMPY                    DXDY0129
007C 1  0166                    DC      SIZE                    DXDY0130
007D 20 06517A00                LIBF    FMPY                    DXDY0131
007E 1  01C8                    DC      D75P                    DXDY0132
007F 20 068A4080                LIBF    FSUB                    DXDY0133
0080 1  01CA                    DC      D10E7                   DXDY0134
0081 20 068A3580                LIBF    FSTO                    DXDY0135
0082 1  0164                    DC      SAVE2                   DXDY0136
0083 20 064C4000                LIBF    FLD                     DXDY0137
0084 1  0160                    DC      DELTA                   DXDY0138
0085 01 CC000164                LDD  L  SAVE2                   DXDY0139
0087 01 4C10012A                BSC  L  DPET,-                  DXDY0140
0089 20 06109940    DXDY2       LIBF    FDIV                    DXDY0141
008A 1  0166                    DC      SIZE                    DXDY0142
008B 0  6224                    LDX   2 36                      DXDY0143
008C 0  61B0                    LDX   1 -80                     DXDY0144
008D 20 068A3580    DXDY3       LIBF    FSTO                    DXDY0145
008E 1  0162                    DC      SAVE1                   DXDY0146
008F 20 068A4080                LIBF    FSUB                    DXDY0147
0090 1  01B0                    DC      D80P1                   DXDY0148
0091 20 068A3580                LIBF    FSTO                    DXDY0149
0092 1  0164                    DC      SAVE2                   DXDY0150
0093 01 C4000164                LD   L  SAVE2                   DXDY0151
0095 01 4C1000A6                BSC  L  HIGH,-                  DXDY0152
0097 20 064C4000    DXDY4       LIBF    FLD                     DXDY0153
0098 1  0162                    DC      SAVE1                   DXDY0154
0099 20 068A40A7                LIBF    FSUBX                   DXDY0155
009A 1  01B8                    DC      TABLE+80                DXDY0156
009B 20 068A3580                LIBF    FSTO                    DXDY0157
009C 1  0164                    DC      SAVE2                   DXDY0158
009D 01 C4000164                LD   L  SAVE2                   DXDY0159
009F 01 4C1000B0                BSC  L  CONT,-                  DXDY0160
00A1 0  714F                    MDX   1 79                      DXDY0161
00A2 0  7010                    MDX     LOW                     DXDY0162
00A3 0  71B1                    MDX   1 -79                     DXDY0163
00A4 0  7000                    MDX     *                       DXDY0164
00A5 0  702A                    MDX     FOUND                   DXDY0165
                    *                                           DXDY0166
00A6 20 064C4000    HIGH        LIBF    FLD                     DXDY0167
00A7 1  0162                    DC      SAVE1                   DXDY0168
00A8 20 06517A00                LIBF    FMPY                    DXDY0169
00A9 1  01BA                    DC      DP1                     DXDY0170
00AA 0  7201                    MDX   2 1                       DXDY0171
00AB 0  72BA                    MDX   2 -70                     DXDY0172
00AC 0  7017                    MDX     ERROR                   DXDY0173
00AD 0  7246                    MDX   2 70                      DXDY0174
00AE 0  70DE                    MDX     DXDY3                   DXDY0175
00AF 0  70DD                    MDX     DXDY3                   DXDY0176
00B0 0  7108        CONT        MDX   1 8                       DXDY0177
00B1 0  70E5                    MDX     DXDY4                   DXDY0178
00B2 0  7011                    MDX     ERROR                   DXDY0179
00B3 0  61B0        LOW         LDX   1 -80                     DXDY0180
00B4 20 064C4000                LIBF    FLD                     DXDY0181
00B5 1  0162                    DC      SAVE1                   DXDY0182
00B6 20 068A4080                LIBF    FSUB                    DXDY0183
00B7 1  01C6                    DC      D8P                     DXDY0184
```

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00B8 20 068A3580          LIBF     FSTO                    DXDY0185
00B9 1  0164              DC       SAVE2                   DXDY0186
00BA 01 C4000164          LD   L   SAVE2                   DXDY0187
00BC 01 4C1000D0          BSC  L   FOUND,-                 DXDY0188
00BE 20 064C4000          LIBF     FLD                     DXDY0189
00BF 1  0162              DC       SAVE1                   DXDY0190
00C0 20 06517A00          LIBF     FMPY                    DXDY0191
00C1 1  016C              DC       D10P                    DXDY0192
00C2 0  72FF              MDX   2  -1                      DXDY0193
00C3 0  70C9              MDX      DXDY3                   DXDY0194
00C4 20 176558D5    ERROR LIBF     PRNTN                   DXDY0195
00C5 0  3F00              DC       /3F00                   DXDY0196
00C6 20 176558D5          LIBF     PRNTN                   DXDY0197
00C7 0  2100              DC       /2100                   DXDY0198
00C8 1  01CC              DC       MES1-1                  DXDY0199
00C9 0  0000              DC       0                       DXDY0200
00CA 30 04517227          CALL     DMPHX                   DXDY0201
00CC 0  1000              DC       /1000                   DXDY0202
00CD 0  7FFF              DC       /7FFF                   DXDY0203
00CE 30 059C98C0          CALL     EXIT                    DXDY0204
00D0 01 CD0001BA    FOUND LDD  L1  TABLE+82                DXDY0205
00D2 00 DC000000    ADY   STD  L   *-*                     DXDY0206
00D4 01 DC000162          STD  L   SAVE1                   DXDY0207
00D6 01 CD0001BC          LDD  L1  TABLE+84                DXDY0208
00D8 00 DC000000    ADY1  STD  L   *-*                     DXDY0209
00DA 01 DC000164          STD  L   SAVE2                   DXDY0210
00DC 01 CD0001BE          LDD  L1  TABLE+86                DXDY0211
00DE 00 DC000000    ADL   STD  L   *-*                     DXDY0212
00E0 0  72DC              MDX   2  -36                     DXDY0213
00E1 0  7000              MDX      *                       DXDY0214
00E2 01 6E00015E          STX  L2  CONS                    DXDY0215
00E4 01 6E800159          STX  I2  ANEXP                   DXDY0216
00E6 0  61FC              LDX   1  -4                      DXDY0217
00E7 20 064C4000    DXDY5 LIBF     FLD                     DXDY0218
00E8 1  016C              DC       D10P                    DXDY0219
00E9 20 06067240          LIBF     FAXI                    DXDY0220
00EA 1  015E              DC       CONS                    DXDY0221
00EB 20 06517A27          LIBF     FMPYX                   DXDY0222
00EC 1  0166              DC       SAVE1+4                 DXDY0223
00ED 20 068A35A7          LIBF     FSTOX                   DXDY0224
00EE 1  0166              DC       SAVE1+4                 DXDY0225
00EF 0  7102              MDX   1  2                       DXDY0226
00F0 0  70F6              MDX      DXDY5                   DXDY0227
00F1 01 CC000162          LDD  L   SAVE1                   DXDY0228
00F3 01 DC8000D3          STD  I   ADY+1                   DXDY0229
                    *                                     DXDY0230
00F5 20 064C4000          LIBF     FLD                     DXDY0231
00F6 1  015C              DC       YMIN                    DXDY0232
00F7 20 06109940          LIBF     FDIV                    DXDY0233
00F8 1  0164              DC       SAVE2                   DXDY0234
00F9 0  C062              LD       YMIN                    DXDY0235
00FA 01 4C1000FF          BSC  L   DXDY8,-                 DXDY0236
00FC 20 05246267          LIBF     EIFIX                   DXDY0237
00FD 0  985C              SD       DEC1                    DXDY0238
00FE 0  7001              MDX      DXDY9                   DXDY0239
00FF 20 05246267    DXDY8 LIBF     EIFIX                   DXDY0240
0100 20 051938C0    DXDY9 LIBF     EFLT                    DXDY0241
0101 20 06517A00          LIBF     FMPY                    DXDY0242
0102 1  0164              DC       SAVE2                   DXDY0243
0103 20 068A3580          LIBF     FSTO                    DXDY0244
```

```
0105 0  C856              LDD     YMIN                          DXDY0246
0106 01 DC80001D          STD  I  AYMIN                         DXDY0247
                  *                                             DXDY0248
0108 01 74000158          MDX  L  SCAL,0                        DXDY0249
010A 0  7028              MDX     SCAL1                         DXDY0250
010B 0  703B              MDX     EXIT                          DXDY0251
                  *                                             DXDY0252
010C 20 064C4000  DZERO   LIBF    FLD                           DXDY0253
010D 1  015C              DC      YMIN                          DXDY0254
010E 20 06517A00          LIBF    FMPY                          DXDY0255
010F 1  01C0              DC      DP8                           DXDY0256
0110 20 068A3580          LIBF    FSTO                          DXDY0257
0111 1  0164              DC      SAVE2                         DXDY0258
0112 01 CC000164          LDD  L  SAVE2                         DXDY0259
0114 01 BC0001B8          DCM  L  DOP                           DXDY0260
0116 0  7009              MDX     D1                            DXDY0261
0117 0  700F              MDX     D2                            DXDY0262
0118 01 CC0001BE          LDD  L  DMP5                          DXDY0263
011A 01 DC00015C          STD  L  YMIN                          DXDY0264
011C 20 064C4000          LIBF    FLD                           DXDY0265
011D 1  01A6              DC      D1P                           DXDY0266
011E 01 4C000089  DO      BSC  L  DXDY2                         DXDY0267
0120 20 068A3580  D1      LIBF    FSTO                          DXDY0268
0121 1  015C              DC      YMIN                          DXDY0269
0122 20 06517A00          LIBF    FMPY                          DXDY0270
0123 1  01C4              DC      D2P                           DXDY0271
0124 30 060654C0          CALL    FAVL                          DXDY0272
0126 0  70F7              MDX     DO                            DXDY0273
0127 20 06044100  D2      LIBF    FADD                          DXDY0274
0128 1  015C              DC      YMIN                          DXDY0275
0129 0  70F6              MDX     D1                            DXDY0276
                  *                                             DXDY0277
012A 20 22559000  DPET    LIBF    SNR                           DXDY0278
012B 20 06517A00          LIBF    FMPY                          DXDY0279
012C 1  01C2              DC      D1P3                          DXDY0280
012D 20 06044100          LIBF    FADD                          DXDY0281
012E 1  015E              DC      YMAX                          DXDY0282
012F 20 068A3580          LIBF    FSTO                          DXDY0283
0130 1  015C              DC      YMIN                          DXDY0284
0131 01 4C00004E          BSC  L  DXDY1                         DXDY0285
                  *                                             DXDY0286
0133 0  1010      SCAL1   SLA     16                            DXDY0287
0134 0  D023              STO     SCAL                          DXDY0288
0135 00 66800000  NN      LDX  I2 *-*           XR2 HAS N       DXDY0289
0137 20 064C4000  SCAL2   LIBF    FLD                           DXDY0290
0138 0  0000      YY      DC      *-*                           DXDY0291
0139 20 068A4080          LIBF    FSUB                          DXDY0292
013A 1  015C              DC      YMIN                          DXDY0293
013B 20 06109940          LIBF    FDIV                          DXDY0294
013C 0  0000      DYY     DC      *-*                           DXDY0295
013D 20 068A3580          LIBF    FSTO                          DXDY0296
013E 0  0000      YYY     DC      *-*                           DXDY0297
013F 0  C0F8              LD      YY                            DXDY0298
0140 0  9016              S       KK                            DXDY0299
0141 0  D0F6              STO     YY                            DXDY0300
0142 0  D0FB              STO     YYY                           DXDY0301
0143 0  72FF              MDX   2 -1                            DXDY0302
0144 0  70F2              MDX     SCAL2                         DXDY0303
                  *                                             DXDY0304
0145 01 7402002D          MDX  L  DXDY,2                        DXDY0305
0147 01 7407002D  EXIT    MDX  L  DXDY,7                        DXDY0306
```

```
0149 00 65000000    XR1    LDX  L1 *-*                          DXDY0307
014B 00 66000000    XR2    LDX  L2 *-*                          DXDY0308
014D 00 67000000    XR3    LDX  L3 *-*                          DXDY0309
014F 01 4C80002D           BSC  I  DXDY                         DXDY0310
                    *                                           DXDY0311
                    *                                           DXDY0312
0151 0  0000        SAVE   DC      0                            DXDY0313
0152 0  69F7               STX    1 XR1+1                       DXDY0314
0153 0  6AF8               STX    2 XR2+1                       DXDY0315
0154 0  6BF9               STX    3 XR3+1                       DXDY0316
0155 01 4C800151           BSC  I  SAVE                         DXDY0317
                    *                                           DXDY0318
                    *      CONSTANTS AND TABLES                 DXDY0319
                    *                                           DXDY0320
0157 0  0000        KK     DC      0                            DXDY0321
0158 0  0000        SCAL   DC      0                            DXDY0322
0159 0  0000        ANEXP  DC      0                            DXDY0323
015A 00 00000001    DEC1   DEC     1                           DXDY0324
015C 00 00000000    YMIN   DEC     0                           DXDY0325
015E 00 00000000    YMAX   DEC     0                           DXDY0326
0160 00 00000000    DELTA  DEC     0                           DXDY0327
0162 00 00000000    SAVE1  DEC     0                           DXDY0328
0164 00 00000000    SAVE2  DEC     0                           DXDY0329
0166 00 00000000    SIZE   DEC     0                           DXDY0330
0168 00 50CCCC84    TABLE  DEC     10.1          1             DXDY0331
016A 00 50000084           DEC     10.                         DXDY0332
016C 00 50000084    D10P   DEC     10.                         DXDY0333
016E 00 40000081           DEC     1.                          DXDY0334
0170 00 6B333384           DEC     13.4          2             DXDY0335
0172 00 6AAAAA84           DEC     13.3333333                  DXDY0336
0174 00 50000085           DEC     20.                         DXDY0337
0176 00 60000081           DEC     1.5                         DXDY0338
0178 00 40666685           DEC     16.1          3             DXDY0339
017A 00 40000085           DEC     16.                         DXDY0340
017C 00 50000085           DEC     20.                         DXDY0341
017E 00 50000081           DEC     1.25                        DXDY0342
0180 00 50666685           DEC     20.1          4             DXDY0343
0182 00 50000085           DEC     20.                         DXDY0344
0184 00 50000085           DEC     20.                         DXDY0345
0186 00 40000081           DEC     1.                          DXDY0346
0188 00 64666685           DEC     25.1          5             DXDY0347
018A 00 64000085           DEC     25.                         DXDY0348
018C 00 64000085           DEC     25.                         DXDY0349
018E 00 40000081           DEC     1.                          DXDY0350
0190 00 42CCCC86           DEC     33.4          6             DXDY0351
0192 00 42AAAA86           DEC     33.3333333                  DXDY0352
0194 00 64000086           DEC     50.                         DXDY0353
0196 00 60000081           DEC     1.5                         DXDY0354
0198 00 50333386           DEC     40.1          7             DXDY0355
019A 00 50000086           DEC     40.                         DXDY0356
019C 00 64000086           DEC     50.                         DXDY0357
019E 00 50000081           DEC     1.25                        DXDY0358
01A0 00 64333386           DEC     50.1          8             DXDY0359
01A2 00 64000086           DEC     50.                         DXDY0360
01A4 00 64000086           DEC     50.                         DXDY0361
01A6 00 40000081    D1P    DEC     1.                          DXDY0362
01A8 00 42B33387           DEC     66.7          9             DXDY0363
01AA 00 42AAAA87           DEC     66.6666667                  DXDY0364
01AC 00 64000087           DEC     100.                        DXDY0365
01AE 00 60000081           DEC     1.5                         DXDY0366
01B0 00 50199987    D80P1  DEC     80.1          10            DXDY0367
```

```
01B2 00 50000087          DEC     80.                                    DXDY0368
01B4 00 64000087          DEC     100.                                   DXDY0369
01B6 00 50000081          DEC     1.25                                   DXDY0370
01B8 00 00000000  DOP     DEC     0.                                     DXDY0371
01BA 00 6666667D  DP1     DEC     0.1                                    DXDY0372
01BC 00 40000080  DP5     DEC     0.5                                    DXDY0373
01BE 00 C0000080  DMP5    DEC     -0.5                                   DXDY0374
01C0 00 66666680  DP8     DEC     0.8                                    DXDY0375
01C2 00 53333381  D1P3    DEC     1.3                                    DXDY0376
01C4 00 40000082  D2P     DEC     2.                                     DXDY0377
01C6 00 40000084  D8P     DEC     8.                                     DXDY0378
01C8 00 4B000087  D75P    DEC     75.                                    DXDY0379
01CA 00 4C4B4098  D10E7   DEC     1.E7                                   DXDY0380
01CC 0  0013              DC      MES2-MES1                              DXDY0381
01CD    0026      MES1    DMES  1 '4XERROR SUBR. DXDY/SCALE. CALL DUMP.  DXDY0382
01E0    0000      MES2    BSS     0                                      DXDY0383
0067              TVLOC   EQU     103                                    DXDY0384
0068              LWA     EQU     104                                    DXDY0385
015E              CONS    EQU     YMAX                                   DXDY0386
0157              R       EQU     KK                                     DXDY0387
01E0              END                                                    DXDY0388

     NO ERRORS IN ABOVE ASSEMBLY.
DXDY  SCALN
DUP FUNCTION COMPLETED
```

```
                        ************************************************** TABLG002
                        *  IBM 1800 SUBROUTINES FOR CALCOMP 506/570.     * TABLG003
                        ************************************************** TABLG004
                        *                                                * TABLG005
                        *  TABLE  TABLG                                  * TABLG006
                        *  CALLING SEQUENCE  (ONLY ASSEMBLER)            * TABLG007
                        *  ----------------                              * TABLG008
                        *     CALL     TABLG                             * TABLG009
                        *     ORG      *-1                               * TABLG010
                        *     DC       /6500                               TABLG011
                        *     BSS      1                                 * TABLG012
                        *              THIS MEANS  LDX  L1 TABLG FOR TABLG * TABLG013
                        *              NOT IN SKELETON                   * TABLG014
                        *                                                * TABLG015
                        ************************************************** TABLG016
0000     230424C7       TABLG    ENT      TABLG                             TABLG017
0000 00  6666667D       TABLG    DEC      0.1                               TABLG018
0002 00  6666667D                DEC      0.1                               TABLG019
0004 00  6666667D                DEC      0.1                               TABLG020
0006 00  6666667D                DEC      0.1                               TABLG021
0008 00  6666667D                DEC      0.1                               TABLG022
000A 00  6666667D                DEC      0.1                               TABLG023
000C 00  6666667D                DEC      0.1                               TABLG024
000E 00  6666667D                DEC      0.1                               TABLG025
0010 00  6666667D                DEC      0.1                               TABLG026
0012 00  6666667D                DEC      0.1                               TABLG027
0014 00  6666667E                DEC      0.2                               TABLG028
0016 00  6666667E                DEC      0.2                               TABLG029
0018 00  6666667E                DEC      0.2                               TABLG030
001A 00  6666667E                DEC      0.2                               TABLG031
001C 00  6666667E                DEC      0.2                               TABLG032
001E 00  4000007F                DEC      0.25                              TABLG033
0020 00  4000007F                DEC      0.25                              TABLG034
0022 00  4000007F                DEC      0.25                              TABLG035
0024 00  4000007F                DEC      0.25                              TABLG036
0026 00  4000007F                DEC      0.25                              TABLG037
0028 00  4000007F                DEC      0.25                              TABLG038
002A 00  4000007F                DEC      0.25                              TABLG039
002C 00  4000007F                DEC      0.25                              TABLG040
002E 00  40000080                DEC      0.5                               TABLG041
0030 00  40000080                DEC      0.5                               TABLG042
0032 00  40000080                DEC      0.5                               TABLG043
0034 00  40000080                DEC      0.5                               TABLG044
0036 00  40000080                DEC      0.5                               TABLG045
0038 00  40000080                DEC      0.5                               TABLG046
003A 00  40000081                DEC      1.                                TABLG047
003C 00  40000082                DEC      2.                                TABLG048
003E 00  40000082                DEC      2.                                TABLG049
0040 00  50000084                DEC      10.                               TABLG050
0042 0   0002                   DC       2                                 TABLG051
0043 0   003C                   DC       60                                TABLG052
0044 0   0016                   DC       22                                TABLG053
0045 0   003C                   DC       60                                TABLG054
0046 0   0028                   DC       40                                TABLG055
0047 0   003E                   DC       62                                TABLG056
0048 0   0030                   DC       48                                TABLG057
0049 0   003E                   DC       62                                TABLG058
004A 0   0038                   DC       56                                TABLG059
004B 0   0040                   DC       64                                TABLG060
004C 0   003C                   DC       60                                TABLG061
004D 0   0040                   DC       64                                TABLG062
```

```
004E 0  0040            DC      64          TABLG063
004F 0  0040            DC      64          TABLG064
0050 0  0042            DC      66          TABLG065
0051 0  0042            DC      66          TABLG066
0052                    END                 TABLG067

      NO ERRORS IN ABOVE ASSEMBLY.
TABLG
DUP FUNCTION COMPLETED
```

```
                                                                                DXLG0002
*  IBM 1800 SUBROUTINES FOR CALCOMP 506/570.                                    * DXLG0003
                                                                                DXLG0004
*                                                                               * DXLG0005
*  SUBROUTINE DXLG                                                              * DXLG0006
*                                                                               * DXLG0007
*  CALLING SEQUENCE                                                             * DXLG0008
*  ----------------                                                             * DXLG0009
*  1.FORTRAN                                                                    * DXLG0010
*     CALL DXLG(SIZE,YMAXL,YMINL,DY,NT,K4,UNIT,                                * DXLG0011
*                                JST)                                          * DXLG0012
*  2.ASSEMBLER                                                                  * DXLG0013
*     CALL     DXLG                                                            * DXLG0014
*     DC       SIZE          LENGTH OF AXIS                                    * DXLG0015
*     DC       YMAXL         LOG. OF MAX. VALUE                                * DXLG0016
*     DC       YMINL         LOG. OF MIN. VALUE                                * DXLG0017
*     DC       DY            LOG.FUNCT.INCR. PER 1 CM                          * DXLG0018
*     DC       NT            TYPE OF SCALE                                     * DXLG0019
*     DC       K4            POINT NUMBER CONC. YMINL                          * DXLG0020
*     DC       UNIT          LENGTH IN CM OF 1 DECADE                          * DXLG0021
*     DC       JST           INDICATOR FOR CALCULATION                         * DXLG0022
*                            OF UNIT                                           * DXLG0023
                                                                                DXLG0024
0000     049D31C0       ENT      DXLG                                          DXLG0025
0000 0   0000       DXLG DC       0                                            DXLG0026
0001 01  6D0000E3         STX  L1 XR1+1                                        DXLG0027
0003 01  6E0000E5         STX  L2 XR2+1                                        DXLG0028
0005 01  6F0000E7         STX  L3 XR3+1                                        DXLG0029
0007 01  65800000         LDX  I1 DXLG                                         DXLG0030
0009 01  660000EC         LDX  L2 R                                            DXLG0031
000B 00  67800067         LDX  I3 TVLOC                                        DXLG0032
000D 00  CD800000         LDD  I1 0                                            DXLG0033
000F 0   DA16             STD   2 SIZE-R                                       DXLG0034
0010 00  CD800001         LDD  I1 1                                            DXLG0035
0012 0   DA10             STD   2 YMAXL-R                                      DXLG0036
0013 00  CD800002         LDD  I1 2                                            DXLG0037
0015 0   DA12             STD   2 YMINL-R                                      DXLG0038
0016 0   C2FF             LD    2 TABLG+1-R                                    DXLG0039
0017 0   9229             S     2 K2-R                                         DXLG0040
0018 0   D04C             STO     DMIN                                         DXLG0041
0019 0   822D             A     2 K66-R                                        DXLG0042
001A 0   D03D             STO     NP+1                                         DXLG0043
                      *                                                       DXLG0044
                      *     SEARCH TYPE OF SCALE                              DXLG0045
                      *                                                       DXLG0046
001B 20  064C4000         LIBF    FLD                                          DXLG0047
001C 1   00FC             DC      YMAXL                                        DXLG0048
001D 20  068A4080         LIBF    FSUB                                         DXLG0049
001E 1   00FE             DC      YMINL                                        DXLG0050
001F 20  068A3580         LIBF    FSTO                                         DXLG0051
0020 1   0100             DC      SAVE                                         DXLG0052
0021 0   CA14             LDD   2 SAVE-R                                       DXLG0053
0022 0   BA22             DCM   2 DOP-R                                        DXLG0054
0023 0   7006             MDX     DX2                                          DXLG0055
0024 0   7003             MDX     DX1                                          DXLG0056
0025 0   C229             LD    2 K2-R                                         DXLG0057
0026 0   D2FE             STO   2 NT-R                                         DXLG0058
0027 0   7019             MDX     DX10                                         DXLG0059
0028 01  4C0000CE     DX1 BSC  L  ERROR                                        DXLG0060
002A 20  064C4000     DX2 LIBF    FLD                                          DXLG0061
002B 1   0102             DC      SIZE                                         DXLG0062
```

```
002C 20 06109940          LIBF     FDIV                    DXLG0063
002D 1  0100              DC       SAVE                    DXLG0064
002E 20 068A3580          LIBF     FSTO                    DXLG0065
002F 1  0104              DC       UNIT                    DXLG0066
0030 0  61F0              LDX   1  -16                     DXLG0067
0031 20 064C4000    DX3   LIBF     FLD                     DXLG0068
0032 1  0104              DC       UNIT                    DXLG0069
0033 20 068A40A7          LIBF     FSUBX                   DXLG0070
0034 1  00FC              DC       T+16                    DXLG0071
0035 20 068A3580          LIBF     FSTO                    DXLG0072
0036 1  0100              DC       SAVE                    DXLG0073
0037 0  C214              LD    2  SAVE-R                  DXLG0074
0038 01 4C10003D          BSC   L  DX4,-                   DXLG0075
003A 0  7102              MDX   1  2                       DXLG0076
003B 0  70F5              MDX      DX3                     DXLG0077
                    *                                     DXLG0078
003C 0  61FE              LDX   1  -2                      DXLG0079
003D 0  7112        DX4   MDX   1  18                      DXLG0080
003E 0  7000              MDX      *                       DXLG0081
003F 01 6D0000EA          STX   L1 NT                      DXLG0082
                    *                                     DXLG0083
0041 20 064C4000    DX10  LIBF     FLD                     DXLG0084
0042 1  00FE              DC       YMINL                   DXLG0085
0043 20 091899C0          LIBF     IFIX                    DXLG0086
0044 0  D21A              STO   2  MINL-R                  DXLG0087
0045 0  C212              LD    2  YMINL-R                 DXLG0088
0046 01 4C10004B          BSC   L  DX11,-                  DXLG0089
0048 01 74FF0106          MDX   L  MINL,-1                 DXLG0090
004A 0  7000              MDX      *                       DXLG0091
004B 0  C21A        DX11  LD    2  MINL-R                  DXLG0092
004C 20 064D6063          LIBF     FLOAT                   DXLG0093
004D 20 06882640          LIBF     FSBR                    DXLG0094
004E 1  00FE              DC       YMINL                   DXLG0095
004F 20 06109940          LIBF     FDIV                    DXLG0096
0050 1  0110              DC       CONS                    DXLG0097
0051 30 069D7540          CALL     FXPN                    DXLG0098
0053 20 068A3580          LIBF     FSTO                    DXLG0099
0054 1  0100              DC       SAVE                    DXLG0100
0055 01 658000EA          LDX   I1 NT                      DXLG0101
0057 00 CD000000    NP    LDD   L1 *-*                     DXLG0102
0059 0  DA26              STD   2  KT1-R                   DXLG0103
005A 0  1090              SLT      16                      DXLG0104
005B 0  8229              A     2  K2-R                    DXLG0105
005C 0  9226              S     2  KT1-R                   DXLG0106
005D 0  D220              STO   2  COUNT-R                 DXLG0107
005E 01 65800112          LDX   I1 KT1                     DXLG0108
0060 0  CA0E              LDD   2  D1P-R                   DXLG0109
0061 0  DA1C              STD   2  YMIN1-R                 DXLG0110
0062 20 064C4000    DX12  LIBF     FLD                     DXLG0111
0063 1  0108              DC       YMIN1                   DXLG0112
0064 20 06044127          LIBF     FADDX                   DXLG0113
0065 0  0000        DMIN  DC       *-*                     DXLG0114
0066 20 068A3580          LIBF     FSTO                    DXLG0115
0067 1  010A              DC       YMIN2                   DXLG0116
0068 20 068A4080          LIBF     FSUB                    DXLG0117
0069 1  0100              DC       SAVE                    DXLG0118
006A 20 068A3580          LIBF     FSTO                    DXLG0119
006B 1  010C              DC       SAVE1                   DXLG0120
006C 0  C220              LD    2  SAVE1-R                 DXLG0121
006D 01 4C100078          BSC   L  DX15,-                  DXLG0122
006F 0  CA1E              LDD   2  YMIN2-R                 DXLG0123
```

```
0070 0  DA1C            STD   2 YMIN1-R                    DXLG0124
0071 0  7102            MDX   1 2                          DXLG0125
0072 01 74FE010C        MDX   L COUNT,-2                   DXLG0126
0074 0  70ED            MDX     DX12                       DXLG0127
0075 0  C227            LD    2 KT2-R                      DXLG0128
0076 0  8229            A     2 K2-R                       DXLG0129
0077 0  7003            MDX     DX16                       DXLG0130
0078 01 6D000100 DX15   STX   L1 SAVE                      DXLG0131
007A 0  C214            LD    2 SAVE-R                     DXLG0132
007B 0  9226 DX16       S     2 KT1-R                      DXLG0133
007C 0  1801            SRA   1                            DXLG0134
007D 0  8228            A     2 K1-R                       DXLG0135
007E 01 65800000        LDX   I1 DXLG                      DXLG0136
0080 00 D5800005        STO   I1 5                         DXLG0137
                *                                          DXLG0138
0082 20 064C4000        LIBF    FLD                        DXLG0139
0083 1  0108            DC      YMIN1                      DXLG0140
0084 30 064D5000        CALL    FLN                        DXLG0141
0086 20 06517A00        LIBF    FMPY                       DXLG0142
0087 1  0110            DC      CONS                       DXLG0143
0088 20 068A3580        LIBF    FSTO                       DXLG0144
0089 1  0100            DC      SAVE                       DXLG0145
008A 0  C07B            LD      MINL                       DXLG0146
008B 20 064D6063        LIBF    FLOAT                      DXLG0147
008C 20 06044100        LIBF    FADD                       DXLG0148
008D 1  0100            DC      SAVE                       DXLG0149
008E 20 068A3580        LIBF    FSTO                       DXLG0150
008F 1  00FE            DC      YMINL                      DXLG0151
0090 0  C86D            LDD     YMINL                      DXLG0152
0091 00 DD800002        STD   I1 2                         DXLG0153
0093 00 C5800007        LD    I1 7                         DXLG0154
0095 01 4C2000A4        BSC   L  DX18,Z                    DXLG0155
0097 20 064C4000        LIBF    FLD                        DXLG0156
0098 1  00FC            DC      YMAXL                      DXLG0157
0099 20 068A4080        LIBF    FSUB                       DXLG0158
009A 1  00FE            DC      YMINL                      DXLG0159
009B 20 06125640        LIBF    FDVR                       DXLG0160
009C 1  0102            DC      SIZE                       DXLG0161
009D 20 068A3580        LIBF    FSTO                       DXLG0162
009E 1  0100            DC      SAVE                       DXLG0163
009F 0  C860            LDD     SAVE                       DXLG0164
00A0 00 DD800006 DX17   STD   I1 6                         DXLG0165
00A2 0  D869            STD     SAVE1                      DXLG0166
00A3 0  7005            MDX     DX20                       DXLG0167
00A4 01 668000EA DX18   LDX   I2 NT                        DXLG0168
00A6 01 CE0000EA        LDD   L2 T-2                       DXLG0169
00A8 0  70F7            MDX     DX17                       DXLG0170
00A9 20 064C4000 DX20   LIBF    FLD                        DXLG0171
00AA 1  00FA            DC      D1P                        DXLG0172
00AB 20 06109940        LIBF    FDIV                       DXLG0173
00AC 1  010C            DC      SAVE1                      DXLG0174
00AD 20 068A3580        LIBF    FSTO                       DXLG0175
00AE 1  0100            DC      SAVE                       DXLG0176
00AF 0  C850            LDD     SAVE                       DXLG0177
00B0 00 DD800003        STD   I1 3                         DXLG0178
00B2 0  C037            LD      NT                         DXLG0179
00B3 0  1801            SRA     1                          DXLG0180
00B4 00 D5800004        STO   I1 4                         DXLG0181
00B6 0  D033            STO     NT                         DXLG0182
00B7 0  905F            S       K8                         DXLG0183
00B8 01 4C2800E0        BSC   L  EXIT,+7                   DXLG0184
```

```
00BA 0  C851              LDD     SAVE1                DXLG0185
00BB 0  D844              STD     SAVE                 DXLG0186
00BC 0  62FA              LDX   2 -6                   DXLG0187
00BD 20 064C4000          LIBF    FLD                  DXLG0188
00BE 1  010C              DC      SAVE1                DXLG0189
00BF 20 068A4080   DX22   LIBF    FSUB                 DXLG0190
00C0 1  00FA              DC      D1P                  DXLG0191
00C1 20 068A3580          LIBF    FSTO                 DXLG0192
00C2 1  00FC              DC      YMAXL                DXLG0193
00C3 0  C038              LD      YMAXL                DXLG0194
00C4 01 4C1000DA          BSC   L DX25,-               DXLG0195
00C6 20 064C4000          LIBF    FLD                  DXLG0196
00C7 1  010C              DC      SAVE1                DXLG0197
00C8 20 06044100          LIBF    FADD                 DXLG0198
00C9 1  0100              DC      SAVE                 DXLG0199
00CA 20 068A3580          LIBF    FSTO                 DXLG0200
00CB 1  010C              DC      SAVE1                DXLG0201
00CC 0  7201              MDX   2 1                    DXLG0202
00CD 0  70F1              MDX     DX22                 DXLG0203
00CE 20 176558D5   ERROR  LIBF    PRNTN                DXLG0204
00CF 0  3D00              DC      /3D00                DXLG0205
00D0 20 176558D5          LIBF    PRNTN                DXLG0206
00D1 0  2100              DC      /2100                DXLG0207
00D2 1  011A              DC      MES1-1               DXLG0208
00D3 0  0000              DC      0                    DXLG0209
00D4 30 04517227          CALL    DMPHX                DXLG0210
00D6 0  1000              DC      /1000                DXLG0211
00D7 0  7FFF              DC      /7FFF                DXLG0212
00D8 30 059C98C0          CALL    EXIT                 DXLG0213
00DA 0  6A25       DX25   STX   2 SAVE                 DXLG0214
00DB 0  C024              LD      SAVE                 DXLG0215
00DC 0  8039              A       K7                   DXLG0216
00DD 0  800C              A       NT                   DXLG0217
00DE 00 D5800004          STO   I1 4                   DXLG0218
00E0 01 74080000   EXIT   MDX   L DXLG,8               DXLG0219
00E2 00 65000000   XR1    LDX   L1 *-*                 DXLG0220
00E4 00 66000000   XR2    LDX   L2 *-*                 DXLG0221
00E6 00 67000000   XR3    LDX   L3 *-*                 DXLG0222
00E8 01 4C800000          BSC   I  DXLG                DXLG0223
                   *                                   DXLG0224
                   *      CONSTANTS                    DXLG0225
                   *                                   DXLG0226
00EA 30 230424C7   TABLG  CALL    TABLG                DXLG0227
00EC 00 6C000085   T      DEC     27.                  DXLG0228
00EE 00 48000085          DEC     18.                  DXLG0229
00F0 00 60000084          DEC     12.                  DXLG0230
00F2 00 48000084          DEC     9.                   DXLG0231
00F4 00 60000083          DEC     6.                   DXLG0232
00F6 00 40000083          DEC     4.                   DXLG0233
00F8 00 50000082          DEC     2.5                  DXLG0234
00FA 00 40000081   D1P    DEC     1.                   DXLG0235
00FC 00 00000000   YMAXL  DEC     0                    DXLG0236
00FE 00 00000000   YMINL  DEC     0                    DXLG0237
0100 00 00000000   SAVE   DEC     0                    DXLG0238
0102 00 00000000   SIZE   DEC     0                    DXLG0239
00EA               NT     EQU     TABLG                DXLG0240
0104 00 00000000   UNIT   DEC     0                    DXLG0241
0106 00 00000000   MINL   DEC     0                    DXLG0242
0108 00 00000000   YMIN1  DEC     0                    DXLG0243
010A 00 00000000   YMIN2  DEC     0                    DXLG0244
010C 00 00000000   SAVE1  DEC     0                    DXLG0245
```

```
010E  00 00000000     DOP    DEC     0                                    DXLG0246
0110  00 6F2DEC7F     CONS   DEC     0.4342945                            DXLG0247
0112  0  0000         KT1    DC      0                                    DXLG0248
0113  0  0000         KT2    DC      0                                    DXLG0249
010C                 COUNT  EQU     SAVE1                                DXLG0250
0114  0  0001         K1     DC      1                                    DXLG0251
0115  0  0002         K2     DC      2                                    DXLG0252
0116  0  0007         K7     DC      7                                    DXLG0253
0117  0  0008         K8     DC      8                                    DXLG0254
0118  0  0010         K16    DC      16                                   DXLG0255
0119  0  0042         K66    DC      66                                   DXLG0256
011A  0  0010                DC      MES2-MES1                            DXLG0257
011B     0020         MES1   DMES  1 '4XERROR SUBR. DXLG. CALL DUMP.'E    DXLG0258
012B     0000         MES2   BSS     0                                    DXLG0259
00EC                 R      EQU     T                                    DXLG0260
0067                 TVLOC  EQU     103                                  DXLG0261
012C                        END                                          DXLG0262
```

NO ERRORS IN ABOVE ASSEMBLY.

DXLG
DUP FUNCTION COMPLETED

```
0000     220C14C7          ********************************************** SCALG002
                           *  IBM 1800 SUBROUTINES FOR CALCOMP 506/570.  * SCALG003
                           ********************************************** SCALG004
                           *                                            * SCALG005
                           *  SUBROUTINE SCALG                          * SCALG006
                           *                                            * SCALG007
                           *  CALLING SEQUENCE                          * SCALG008
                           *  ----------------                          * SCALG009
                           *  1.FORTRAN                                 * SCALG010
                           *    CALL SCALG(SIZE,Y,N,K,YMINL,DY,NT,K4,UNIT, * SCALG011
                           *                                  JST)      * SCALG012
                           *  2.ASSEMBLER                               * SCALG013
                           *    CALL     SCALG                          * SCALG014
                           *    DC       SIZE      LENGTH OF AXIS       * SCALG015
                           *    DC       Y         MATRIX               * SCALG016
                           *    DC       N         NUMBER OF VALUES     * SCALG017
                           *    DC       K         STEP TO FIND THE NEXT * SCALG018
                           *                       VALUE IN THE MATRIX  * SCALG019
                           *    DC       YMINL     MIN.LOG.VALUE FOR THE * SCALG020
                           *                       GRADUATION OF THE AXIS * SCALG021
                           *    DC       DY        FUNCT.LOG.INCR.PER 1 CM * SCALG022
                           *    DC       NT        TYPE OF SCALE        * SCALG023
                           *    DC       K4        POINT NO. CORR. TO YMINL * SCALG024
                           *    DC       UNIT      LENGTH FOR ONE DECADE * SCALG025
                           *    DC       JST       INDICATOR FOR CALCULATING* SCALG026
                           *                       THE SCALE            * SCALG027
                           ********************************************** SCALG028
0000     220C14C7          ENT      SCALG                                 SCALG029
0000 0   0000        SCALG DC       0                                     SCALG030
0001 0   6950              STX    1 XR1+1                                 SCALG031
0002 0   6A51              STX    2 XR2+1                                 SCALG032
0003 0   6B52              STX    3 XR3+1                                 SCALG033
0004 01  65800000          LDX    I1 SCALG                                SCALG034
0006 0   C101              LD     1 1                                     SCALG035
0007 0   D013              STO      Y                                     SCALG036
0008 0   D033              STO      YY                                    SCALG037
0009 0   D03E              STO      YYY                                   SCALG038
000A 00  C5800002          LD     I1 2                                    SCALG039
000C 01  4C08004F          BSC    L  EXIT,+                               SCALG040
000E 0   D029              STO      N+1                                   SCALG041
000F 0   C103              LD     1 3                                     SCALG042
0010 0   D00C              STO      K                                     SCALG043
0011 00  C5800003          LD     I1 3                                    SCALG044
0013 0   1001              SLA      1                                     SCALG045
0014 0   D04B              STO      KK                                    SCALG046
0015 0   C104              LD     1 4                                     SCALG047
0016 0   D008              STO      YMINL                                 SCALG048
0017 0   D019              STO      YMIN1                                 SCALG049
0018 0   D02B              STO      YMIN2                                 SCALG050
0019 30  149D4553          CALL     MXMNL                                 SCALG051
001B 0   0000        Y     DC       *-*                                   SCALG052
001C 1   0038              DC       N+1                                   SCALG053
001D 0   0000        K     DC       *-*                                   SCALG054
001E 1   005A              DC       YMAXL                                 SCALG055
001F 0   0000        YMINL DC       *-*                                   SCALG056
0020 0   C100              LD     1 0                                     SCALG057
0021 0   D00D              STO      S                                     SCALG058
0022 0   C105              LD     1 5                                     SCALG059
0023 0   D00E              STO      DY                                    SCALG060
0024 0   C106              LD     1 6                                     SCALG061
0025 0   D00D              STO      NT                                    SCALG062
```

```
0026 0  C107              LD    1 7                          SCALG063
0027 0  D00C              STO     K4                         SCALG064
0028 0  C108              LD    1 8                          SCALG065
0029 0  D00B              STO     UNIT                       SCALG066
002A 0  D01B              STO     UNIT1                      SCALG067
002B 0  C109              LD    1 9                          SCALG068
002C 0  D009              STO     JST                        SCALG069
002D 30 049D31C0          CALL    DXLG                       SCALG070
002F 0  0000        S     DC      *-*                        SCALG071
0030 1  005A              DC      YMAXL                      SCALG072
0031 0  0000        YMIN1 DC      *-*                        SCALG073
0032 0  0000        DY    DC      *-*                        SCALG074
0033 0  0000        NT    DC      *-*                        SCALG075
0034 0  0000        K4    DC      *-*                        SCALG076
0035 0  0000        UNIT  DC      *-*                        SCALG077
0036 0  0000        JST   DC      *-*                        SCALG078
0037 00 66000000    N     LDX   L2 *-*          XR2=N        SCALG079
0039 00 67800067          LDX   I3 TVLOC                     SCALG080
003B 20 064C4000    S2    LIBF    FLD                        SCALG081
003C 0  0000        YY    DC      *-*                        SCALG082
003D 20 06044100          LIBF    FADD                       SCALG083
003E 1  005E              DC      DMN                        SCALG084
003F 30 064D5000          CALL    FLN                        SCALG085
0041 20 06517A00          LIBF    FMPY                       SCALG086
0042 1  005C              DC      CON                        SCALG087
0043 20 068A4080          LIBF    FSUB                       SCALG088
0044 0  0000        YMIN2 DC      *-*                        SCALG089
0045 20 06517A00          LIBF    FMPY                       SCALG090
0046 0  0000        UNIT1 DC      *-*                        SCALG091
0047 20 068A3580          LIBF    FSTO                       SCALG092
0048 0  0000        YYY   DC      *-*                        SCALG093
0049 0  C0F2              LD      YY                         SCALG094
004A 0  9015              S       KK                         SCALG095
004B 0  D0F0              STO     YY                         SCALG096
004C 0  D0FB              STO     YYY                        SCALG097
004D 0  72FF              MDX   2 -1                         SCALG098
004E 0  70EC              MDX     S2                         SCALG099
004F 01 740A0000    EXIT  MDX   L SCALG,10                   SCALG100
0051 00 65000000    XR1   LDX   L1 *-*                       SCALG101
0053 00 66000000    XR2   LDX   L2 *-*                       SCALG102
0055 00 67000000    XR3   LDX   L3 *-*                       SCALG103
0057 01 4C800000          BSC   I SCALG                      SCALG104
005A 00 00000000    YMAXL DEC     0                          SCALG105
005C 00 6F2DEC7F    CON   DEC     0.4342945                  SCALG106
005E 0  4000        DMN   DC      /4000                      SCALG107
005F 0  0000              DC      0                          SCALG108
0060 0  0000        KK    DC      0                          SCALG109
0067                TVLOC EQU     103                        SCALG110
0062                      END                                SCALG111
```

NO ERRORS IN ABOVE ASSEMBLY.

SCALG
DUP FUNCTION COMPLETED

```
                        ************************************************** AXIS0002
                        *  IBM 1800 SUBROUTINES FOR CALCOMP 506/570.     * AXIS0003
                        ************************************************** AXIS0004
                        *                                                * AXIS0005
                        *  SUBROUTINE AXIS                               * AXIS0006
                        *                                                * AXIS0007
                        *  CALLING SEQUENCE                              * AXIS0008
                        *  ----------------                              * AXIS0009
                        *  1.FORTRAN                                     * AXIS0010
                        *    CALL AXIS(X,Y,SIZE,THETA,EBC,NO,YMIN,DY1,DL,* AXIS0011
                        *                                NEXP)           * AXIS0012
                        *  2.ASSEMBLER                                   * AXIS0013
                        *    CALL     AXIS                               * AXIS0014
                        *    DC       X          ABSCISSE AND            * AXIS0015
                        *    DC       Y          ORDINATE OF THE START OF* AXIS0016
                        *                        THE AXIS                * AXIS0017
                        *    DC       SIZE       LENGTH OF THE AXIS      * AXIS0018
                        *    DC       THETA      ANGLE OF THE AXIS       * AXIS0019
                        *    DC       EBC        LABEL OF THE AXIS       * AXIS0020
                        *    DC       N          NUMBER OF CHARACTERS AND* AXIS0021
                        *                        POSITION OF THE LABEL   * AXIS0022
                        *    DC       YMIN       MINIMUM VALUE FOR THE   * AXIS0023
                        *                        GRADUATION OF THE AXIS  * AXIS0024
                        *    DC       DY1        FUNCT. INCR.FOR GRADUAT.* AXIS0025
                        *    DC       DL         INTERVAL IN CM FOR GRAD.* AXIS0026
                        *    DC       NEXP       EXPON.OF 10 FOR DY1 AND * AXIS0027
                        *                        YMIN                    * AXIS0028
                        ************************************************** AXIS0029
0000     019C9880       AXIS     ENT      AXIS                           AXIS0030
0000 0   0000           AXIS     DC       0                              AXIS0031
0001 01  6D00016C                STX   L1 XR1+1                          AXIS0032
0003 01  6E00016E                STX   L2 XR2+1                          AXIS0033
0005 01  6F000170                STX   L3 XR3+1                          AXIS0034
0007 01  65800000                LDX   I1 AXIS                           AXIS0035
0009 01  66000174                LDX   L2 R                              AXIS0036
000B 00  67800067                LDX   I3 TVLOC                          AXIS0037
000D 00  CD800000                LDD   I1 0                              AXIS0038
000F 0   DA02                    STD    2 X-R                            AXIS0039
0010 00  CD800001                LDD   I1 1                              AXIS0040
0012 0   DA04                    STD    2 Y-R                            AXIS0041
0013 00  CD800002                LDD   I1 2                              AXIS0042
0015 0   DA06                    STD    2 SIZE-R                         AXIS0043
0016 00  CD800003                LDD   I1 3                              AXIS0044
0018 0   DA18                    STD    2 THETA-R                        AXIS0045
0019 20  064C4000                LIBF     FLD                            AXIS0046
001A 1   018C                    DC       THETA                          AXIS0047
001B 20  068A4080                LIBF     FSUB                           AXIS0048
001C 1   01BE                    DC       D90P                           AXIS0049
001D 20  068A3580                LIBF     FSTO                           AXIS0050
001E 1   019C                    DC       TH1                            AXIS0051
001F 0   C104                    LD     1 4                              AXIS0052
0020 0   D2CD                    STO    2 EBC-R                          AXIS0053
0021 00  C5800005                LD    I1 5                              AXIS0054
0023 01  4C100028                BSC   L  A1,-                           AXIS0055
0025 0   D254                    STO    2 NO-R                           AXIS0056
0026 0   1010                    SLA      16                             AXIS0057
0027 0   7004                    MDX      A2                             AXIS0058
0028 0   A24C            A1      M      2 KM1-R                          AXIS0059
0029 0   1090                    SLT      16                             AXIS0060
002A 0   D254                    STO    2 NO-R                           AXIS0061
002B 0   C24D                    LD     2 K1-R                           AXIS0062
```

```
002C 0  D255        A2    STO   2 IND-R                                  AXIS0063
002D 00 CD800006          LDD   I1 6                                      AXIS0064
002F 0  DA0A              STD   2 YMIN-R                                  AXIS0065
0030 00 CD800007          LDD   I1 7                                      AXIS0066
0032 0  DA0C              STD   2 DY1-R                                   AXIS0067
0033 00 CD800008          LDD   I1 8                                      AXIS0068
0035 0  DA08              STD   2 DL-R                                    AXIS0069
0036 00 C5800009          LD    I1 9                                      AXIS0070
0038 0  D253              STO   2 NEXP-R                                  AXIS0071
0039 20 064C4000          LIBF    FLD                                     AXIS0072
003A 1  018C              DC      THETA                                   AXIS0073
003B 20 06517A00          LIBF    FMPY                                    AXIS0074
003C 1  0174              DC      RHO                                     AXIS0075
003D 20 068A3580          LIBF    FSTO                                    AXIS0076
003E 1  0186              DC      STH                                     AXIS0077
003F 30 060D6895          CALL    FCOSN                                   AXIS0078
0041 20 068A3580          LIBF    FSTO                                    AXIS0079
0042 1  0184              DC      CTH                                     AXIS0080
0043 30 06889540          CALL    FSIN        CTH=COS(THETA)              AXIS0081
0045 1  0186              DC      STH                                     AXIS0082
0046 20 068A3580          LIBF    FSTO                                    AXIS0083
0047 1  0186              DC      STH         STH=SIN(THETA)              AXIS0084
0048 20 22559000          LIBF    SNR                                     AXIS0085
0049 20 068A3580          LIBF    FSTO                                    AXIS0086
004A 1  0182              DC      STH0        STH0=-SIN(THETA)            AXIS0087
004B 0  61FC              LDX   1 -4                                      AXIS0088
004C 20 064C49C0    A3    LIBF    FLDX                                    AXIS0089
004D 1  0188              DC      CTH+4                                   AXIS0090
004E 20 06517A00          LIBF    FMPY                                    AXIS0091
004F 1  017C              DC      DL                                      AXIS0092
0050 20 068A35A7          LIBF    FSTOX       CTH1=CTH*DL                 AXIS0093
0051 1  018C              DC      CTH1+4      STH1=STH*DL                 AXIS0094
0052 0  7102              MDX   1 2                                       AXIS0095
0053 0  70F8              MDX     A3                                      AXIS0096
0054 20 064C4000          LIBF    FLD                                     AXIS0097
0055 1  0180              DC      DY1                                     AXIS0098
0056 20 06517A00          LIBF    FMPY                                    AXIS0099
0057 1  01A2              DC      DP01                                    AXIS0100
0058 20 068A3580          LIBF    FSTO                                    AXIS0101
0059 1  0180              DC      DY1         DY1=DY1/100.                AXIS0102
005A 20 064C4000          LIBF    FLD                                     AXIS0103
005B 1  017A              DC      SIZE                                    AXIS0104
005C 20 06044100          LIBF    FADD                                    AXIS0105
005D 1  01A4              DC      DP1                                     AXIS0106
005E 20 06109940          LIBF    FDIV                                    AXIS0107
005F 1  017C              DC      DL                                      AXIS0108
0060 20 06044100          LIBF    FADD                                    AXIS0109
0061 1  01B8              DC      D1P                                     AXIS0110
0062 20 091899C0          LIBF    IFIX                                    AXIS0111
0063 0  D252              STO   2 NF-R                                    AXIS0112
0064 0  924D              S     2 K1-R                                    AXIS0113
0065 20 064D6063          LIBF    FLOAT                                   AXIS0114
0066 20 068A3580          LIBF    FSTO                                    AXIS0115
0067 1  018E              DC      FN                                      AXIS0116
0068 0  61FC              LDX   1 -4                                      AXIS0117
0069 20 064C4000    A4    LIBF    FLD                                     AXIS0118
006A 1  017A              DC      SIZE                                    AXIS0119
006B 20 06517A27          LIBF    FMPYX                                   AXIS0120
006C 1  0188              DC      CTH+4                                   AXIS0121
006D 20 06044127          LIBF    FADDX                                   AXIS0122
006E 1  017A              DC      X+4                                     AXIS0123
```

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006F 20 068A35A7          LIBF    FSTOX                    AXIS0124
0070 1  0194              DC      XA+4                     AXIS0125
0071 0  7102              MDX   1 2                        AXIS0126
0072 0  70F6              MDX     A4                       AXIS0127
0073 30 174D68C0          CALL    PLOT                     AXIS0128
0075 1  0176              DC      X                        AXIS0129
0076 1  0178              DC      Y                        AXIS0130
0077 1  01C3              DC      K3                       AXIS0131
0078 30 174D68C0          CALL    PLOT                     AXIS0132
007A 1  0190              DC      XA                       AXIS0133
007B 1  0192              DC      YA                       AXIS0134
007C 1  01C2              DC      K2                       AXIS0135
007D 0  61FC              LDX   1 -4                       AXIS0136
007E 20 064C49C0    A5    LIBF    FLDX                     AXIS0137
007F 1  018C              DC      CTH1+4                   AXIS0138
0080 20 06517A00          LIBF    FMPY                     AXIS0139
0081 1  018E              DC      FN                       AXIS0140
0082 20 06044127          LIBF    FADDX                    AXIS0141
0083 1  017A              DC      X+4                      AXIS0142
0084 20 068A35A7          LIBF    FSTOX                    AXIS0143
0085 1  0194              DC      XA+4                     AXIS0144
0086 0  7102              MDX   1 2                        AXIS0145
0087 0  70F6              MDX     A5                       AXIS0146
0088 0  C253              LD    2 NEXP-R                   AXIS0147
0089 0  824E              A     2 K2-R                     AXIS0148
008A 0  D253              STO   2 NEXP-R                   AXIS0149
008B 20 064D6063          LIBF    FLOAT                    AXIS0150
008C 20 068A3580          LIBF    FSTO                     AXIS0151
008D 1  0194              DC      EXP                      AXIS0152
008E 20 064C4000          LIBF    FLD                      AXIS0153
008F 1  01A4              DC      DP1                      AXIS0154
0090 20 06067240          LIBF    FAXI                     AXIS0155
0091 1  01C7              DC      NEXP                     AXIS0156
0092 20 06517A00          LIBF    FMPY                     AXIS0157
0093 1  017E              DC      YMIN                     AXIS0158
0094 20 068A3580          LIBF    FSTO                     AXIS0159
0095 1  017E              DC      YMIN                     AXIS0160
0096 20 064C4000          LIBF    FLD                      AXIS0161
0097 1  018E              DC      FN                       AXIS0162
0098 20 06517A00          LIBF    FMPY                     AXIS0163
0099 1  0180              DC      DY1                      AXIS0164
009A 0  1010              SLA     16                       AXIS0165
009B 0  D257              STO   2 NCS-R                    AXIS0166
                    *                                      AXIS0167
009C 20 06044100    A8    LIBF    FADD                     AXIS0168
009D 1  017E              DC      YMIN                     AXIS0169
009E 20 068A3580          LIBF    FSTO                     AXIS0170
009F 1  017E              DC      YMIN                     AXIS0171
00A0 30 174D68C0          CALL    PLOT                     AXIS0172
00A2 1  0190              DC      XA                       AXIS0173
00A3 1  0192              DC      YA                       AXIS0174
00A4 1  01C3              DC      K3                       AXIS0175
00A5 0  61FC              LDX   1 -4                       AXIS0176
00A6 20 064C49C0    A9    LIBF    FLDX                     AXIS0177
00A7 1  0186              DC      STH0+4                   AXIS0178
00A8 20 06517A00          LIBF    FMPY                     AXIS0179
00A9 1  01A8              DC      DMP16                    AXIS0180
00AA 01 740001C9          MDX   L IND,0                    AXIS0181
00AC 20 22559000          LIBF    SNR                      AXIS0182
00AD 20 06044127          LIBF    FADDX                    AXIS0183
00AE 1  0194              DC      XA+4                     AXIS0184
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00AF 20 068A35A7          LIBF    FSTOX                AXIS0185
00B0 1  019C              DC      XB+4                 AXIS0186
00B1 0  7102              MDX   1 2                    AXIS0187
00B2 0  70F3              MDX     A9                   AXIS0188
00B3 30 174D68C0          CALL    PLOT                 AXIS0189
00B5 1  0198              DC      XB                   AXIS0190
00B6 1  019A              DC      YB                   AXIS0191
00B7 1  01C2              DC      K2                   AXIS0192
00B8 30 174D68C0          CALL    PLOT                 AXIS0193
00BA 1  0190              DC      XA                   AXIS0194
00BB 1  0192              DC      YA                   AXIS0195
00BC 1  01C2              DC      K2                   AXIS0196
00BD 30 06042880          CALL    FABS                 AXIS0197
00BF 1  017E              DC      YMIN                 AXIS0198
00C0 0  61FA              LDX   1 -6                   AXIS0199
00C1 20 06044100    A10   LIBF    FADD                 AXIS0200
00C2 1  01A4              DC      DP1                  AXIS0201
00C3 20 091899C0          LIBF    IFIX                 AXIS0202
00C4 01 4C0800CD          BSC   L A11,+                AXIS0203
00C6 20 068A4080          LIBF    FSUB                 AXIS0204
00C7 1  01A4              DC      DP1                  AXIS0205
00C8 20 06517A00          LIBF    FMPY                 AXIS0206
00C9 1  01A4              DC      DP1                  AXIS0207
00CA 0  7101              MDX   1 1                    AXIS0208
00CB 0  70F5              MDX     A10                  AXIS0209
00CC 0  61FF              LDX   1 -1                   AXIS0210
00CD 0  7109        A11   MDX   1 9                    AXIS0211
00CE 0  7000              MDX     *                    AXIS0212
00CF 01 6D0001CA          STX   L1 NC                  AXIS0213
00D1 0  61FC              LDX   1 -4                   AXIS0214
00D2 0  C20A              LD    2 YMIN-R               AXIS0215
00D3 01 4C1000D8          BSC   L A12,-                AXIS0216
00D5 0  7102              MDX   1 2                    AXIS0217
00D6 01 740101CA          MDX   L NC,1                 AXIS0218
00D8 20 064C4000    A12   LIBF    FLD                  AXIS0219
00D9 1  017E              DC      YMIN                 AXIS0220
00DA 20 06044127          LIBF    FADDX                AXIS0221
00DB 1  01A2              DC      DP001+4              AXIS0222
00DC 20 068A3580          LIBF    FSTO                 AXIS0223
00DD 1  0196              DC      CON                  AXIS0224
00DE 0  C256              LD    2 NC-R                 AXIS0225
00DF 0  B257              CMP   2 NCS-R                AXIS0226
00E0 0  D257              STO   2 NCS-R                AXIS0227
00E1 0  7000              MDX     *                    AXIS0228
00E2 0  61FC              LDX   1 -4                   AXIS0229
00E3 20 064C49C0    A14   LIBF    FLDX                 AXIS0230
00E4 1  0188              DC      CTH+4                AXIS0231
00E5 20 06517A00          LIBF    FMPY                 AXIS0232
00E6 1  01A4              DC      DP1                  AXIS0233
00E7 20 068A35A7          LIBF    FSTOX                AXIS0234
00E8 1  019C              DC      XB+4                 AXIS0235
00E9 0  C255              LD    2 IND-R                AXIS0236
00EA 0  A256              M     2 NC-R                 AXIS0237
00EB 0  1090              SLT     16                   AXIS0238
00EC 0  824E              A     2 K2-R                 AXIS0239
00ED 20 064D6063          LIBF    FLOAT                AXIS0240
00EE 20 06517A27          LIBF    FMPYX                AXIS0241
00EF 1  0186              DC      STH0+4               AXIS0242
00F0 20 06517A00          LIBF    FMPY                 AXIS0243
00F1 1  01AE              DC      DMP21                AXIS0244
00F2 01 740001C9          MDX   L IND,0                AXIS0245
```

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00F4 20 22559000          LIBF    SNR                 AXIS0246
00F5 20 06044127          LIBF    FADDX               AXIS0247
00F6 1  0194              DC      XA+4                AXIS0248
00F7 20 068A40A7          LIBF    FSUBX               AXIS0249
00F8 1  019C              DC      XB+4                AXIS0250
00F9 20 068A35A7          LIBF    FSTOX               AXIS0251
00FA 1  019C              DC      XB+4                AXIS0252
00FB 0  7102              MDX   1 2                   AXIS0253
00FC 0  70E6              MDX     A14                 AXIS0254
00FD 30 15914099          CALL    NUMBR               AXIS0255
00FF 1  0198              DC      XB                  AXIS0256
0100 1  019A              DC      YB                  AXIS0257
0101 1  01AC              DC      DP21                AXIS0258
0102 1  019C              DC      TH1                 AXIS0259
0103 1  0196              DC      CON                 AXIS0260
0104 1  01C2              DC      K2                  AXIS0261
0105 0  61FC              LDX   1 -4                  AXIS0262
0106 20 0 4C49C0    A17   LIBF    FLDX                AXIS0263
0107 1  0 94              DC      XA+4                AXIS0264
0108 20 0[A40A7           LIBF    FSUBX               AXIS0265
0109 1  018C              DC      CTH1+4              AXIS0266
010A 20 068A35A7          LIBF    FSTOX               AXIS0267
010B 1  0194              DC      XA+4                AXIS0268
010C 0  7102              MDX   1 2                   AXIS0269
010D 0  70F8              MDX     A17                 AXIS0270
010E 20 064C4000          LIBF    FLD                 AXIS0271
010F 1  0180              DC      DY1                 AXIS0272
0110 20 22559000          LIBF    SNR                 AXIS0273
0111 01 74FF01C6          MDX   L NF,-1               AXIS0274
0113 0  7088              MDX     A8                  AXIS0275
                    *                                 AXIS0276
0114 0  61FC              LDX   1 -4                  AXIS0277
0115 0  C257              LD    2 NCS-R               AXIS0278
0116 0  8250              A     2 K4-R                AXIS0279
0117 20 064D6063          LIBF    FLOAT               AXIS0280
0118 20 06517A00          LIBF    FMPY                AXIS0281
0119 1  01AA              DC      DP18                AXIS0282
011A 01 740001C9          MDX   L IND,0              AXIS0283
011C 0  7003              MDX     A19                 AXIS0284
011D 20 06044100          LIBF    FADD                AXIS0285
011E 1  01B2              DC      DP28                AXIS0286
011F 20 22559000          LIBF    SNR                 AXIS0287
0120 20 068A3580    A19   LIBF    FSTO                AXIS0288
0121 1  0196              DC      CON                 AXIS0289
0122 20 06517A27    A20   LIBF    FMPYX               AXIS0290
0123 1  0186              DC      STH0+4              AXIS0291
0124 20 06044127          LIBF    FADDX               AXIS0292
0125 1  017A              DC      X+4                 AXIS0293
0126 20 068A35A7          LIBF    FSTOX               AXIS0294
0127 1  0194              DC      XA+4                AXIS0295
0128 0  C254              LD    2 NO-R                AXIS0296
0129 0  9251              S     2 K8-R                AXIS0297
012A 20 064D6063          LIBF    FLOAT               AXIS0298
012B 20 06517A00          LIBF    FMPY                AXIS0299
012C 1  01B0              DC      DP24                AXIS0300
012D 20 06044100          LIBF    FADD                AXIS0301
012E 1  017A              DC      SIZE                AXIS0302
012F 20 06109940          LIBF    FDIV                AXIS0303
0130 1  01BA              DC      D2P                 AXIS0304
0131 20 06517A27          LIBF    FMPYX               AXIS0305
0132 1  0188              DC      CTH+4               AXIS0306
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0133 20 06044127          LIBF    FADDX                    AXIS0307
0134 1  0194              DC      XA+4                     AXIS0308
0135 20 068A35A7          LIBF    FSTOX                    AXIS0309
0136 1  0194              DC      XA+4                     AXIS0310
0137 20 064C4000          LIBF    FLD                      AXIS0311
0138 1  0196              DC      CON                      AXIS0312
0139 0  7102              MDX   1 2                        AXIS0313
013A 0  70E7              MDX     A20                      AXIS0314
013B 30 22A14093          CALL    SYMBL                    AXIS0315
013D 1  0190              DC      XA                       AXIS0316
013E 1  0192              DC      YA                       AXIS0317
013F 1  01B2              DC      DP28                     AXIS0318
0140 1  018C              DC      THETA                    AXIS0319
0141 0  0000        EBC   DC      *-*                      AXIS0320
0142 1  01C8              DC      NO                       AXIS0321
0143 0  C253              LD    2 NEXP-R                   AXIS0322
0144 01 4C180169          BSC   L EXIT,+-                  AXIS0323
0146 30 22A14093          CALL    SYMBL                    AXIS0324
0148 1  0190              DC      XA                       AXIS0325
0149 1  0192              DC      YA                       AXIS0326
014A 1  01B2              DC      DP28                     AXIS0327
014B 1  018C              DC      THETA                    AXIS0328
014C 1  01CC              DC      EBC1                     AXIS0329
014D 1  01C5              DC      K8                       AXIS0330
014E 0  61FC              LDX   1 -4                       AXIS0331
014F 20 064C49C0    A22   LIBF    FLDX                     AXIS0332
0150 1  0188              DC      CTH+4                    AXIS0333
0151 20 06517A00          LIBF    FMPY                     AXIS0334
0152 1  01B6              DC      D1P2                     AXIS0335
0153 20 06044127          LIBF    FADDX                    AXIS0336
0154 1  0194              DC      XA+4                     AXIS0337
0155 20 068A35A7          LIBF    FSTOX                    AXIS0338
0156 1  0194              DC      XA+4                     AXIS0339
0157 20 064C49C0          LIBF    FLDX                     AXIS0340
0158 1  0186              DC      STH0+4                   AXIS0341
0159 20 06517A00          LIBF    FMPY                     AXIS0342
015A 1  01A6              DC      DP14                     AXIS0343
015B 20 06044127          LIBF    FADDX                    AXIS0344
015C 1  0194              DC      XA+4                     AXIS0345
015D 20 068A35A7          LIBF    FSTOX                    AXIS0346
015E 1  0194              DC      XA+4                     AXIS0347
015F 0  7102              MDX   1 2                        AXIS0348
0160 0  70EE              MDX     A22                      AXIS0349
0161 30 15914099          CALL    NUMBR                    AXIS0350
0163 1  0190              DC      XA                       AXIS0351
0164 1  0192              DC      YA                       AXIS0352
0165 1  01AC              DC      DP21                     AXIS0353
0166 1  018C              DC      THETA                    AXIS0354
0167 1  0194              DC      EXP                      AXIS0355
0168 1  01C0              DC      KM1                      AXIS0356
0169 01 740A0000    EXIT  MDX   L AXIS,10                 AXIS0357
016B 00 65000000    XR1   LDX   L1 *-*                     AXIS0358
016D 00 66000000    XR2   LDX   L2 *-*                     AXIS0359
016F 00 67000000    XR3   LDX   L3 *-*                     AXIS0360
0171 01 4C800000          BSC   I AXIS                     AXIS0361
                    *                                      AXIS0362
                    *     CONSTANTS                        AXIS0363
                    *                                      AXIS0364
0174 00 477D1A7B    RHO   DEC     0.017453294              AXIS0365
0176 00 00000000    X     DEC     0                        AXIS0366
0178 00 00000000    Y     DEC     0                        AXIS0367
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017A  00  00000000    SIZE   DEC     0                        AXIS0368
017C  00  00000000    DL     DEC     0                        AXIS0369
017E  00  00000000    YMIN   DEC     0                        AXIS0370
0180  00  00000000    DY1    DEC     0                        AXIS0371
0182  00  00000000    STHO   DEC     0                        AXIS0372
0184  00  00000000    CTH    DEC     0                        AXIS0373
0186  00  00000000    STH    DEC     0                        AXIS0374
0188  00  00000000    CTH1   DEC     0                        AXIS0375
018A  00  00000000    STH1   DEC     0                        AXIS0376
018C  00  00000000    THETA  DEC     0                        AXIS0377
018E  00  00000000    FN     DEC     0                        AXIS0378
0190  00  00000000    XA     DEC     0                        AXIS0379
0192  00  00000000    YA     DEC     0                        AXIS0380
0194  00  00000000    EXP    DEC     0                        AXIS0381
0196  00  00000000    CON    DEC     0                        AXIS0382
0198  00  00000000    XB     DEC     0                        AXIS0383
019A  00  00000000    YB     DEC     0                        AXIS0384
019C  00  00000000    TH1    DEC     0                        AXIS0385
019E  00  41893777    DP001  DEC     0.001                    AXIS0386
01A0  00  BE76C977    DM001  DEC     -0.001                   AXIS0387
01A2  00  51EB857A    DP01   DEC     0.01                     AXIS0388
01A4  00  6666667D    DP1    DEC     0.1                      AXIS0389
01A6  00  47AE147E    DP14   DEC     0.14                     AXIS0390
01A8  00  AE147B7E    DMP16  DEC     -0.16                    AXIS0391
01AA  00  5C28F57E    DP18   DEC     0.18                     AXIS0392
01AC  00  6B851E7E    DP21   DEC     0.21                     AXIS0393
01AE  00  947AE27E    DMP21  DEC     -0.21                    AXIS0394
01B0  00  7AE1477E    DP24   DEC     0.24                     AXIS0395
01B2  00  47AE147F    DP28   DEC     0.28                     AXIS0396
01B4  00  4CCCCC80    DP6    DEC     0.6                      AXIS0397
01B6  00  4CCCCC81    D1P2   DEC     1.2                      AXIS0398
01B8  00  40000081    D1P    DEC     1.                       AXIS0399
01BA  00  40000082    D2P    DEC     2.                       AXIS0400
01BC  00  50000084    D10P   DEC     10.                      AXIS0401
01BE  00  5A000087    D90P   DEC     90.                      AXIS0402
01C0  0   FFFF        KM1    DC      -1                       AXIS0403
01C1  0   0001        K1     DC      1                        AXIS0404
01C2  0   0002        K2     DC      2                        AXIS0405
01C3  0   0003        K3     DC      3                        AXIS0406
01C4  0   0004        K4     DC      4                        AXIS0407
01C5  0   0008        K8     DC      8                        AXIS0408
01C6  0   0000        NF     DC      0                        AXIS0409
01C7  0   0000        NEXP   DC      0                        AXIS0410
01C8  0   0000        NO     DC      0                        AXIS0411
01C9  0   0000        IND    DC      0                        AXIS0412
01CA  0   0000        NC     DC      0                        AXIS0413
01CB  0   0000        NCS    DC      0                        AXIS0414
01CC      0008        EBC1   EBC     . (X10   ).              AXIS0415
0174                  R      EQU     RHO                      AXIS0416
0067                  TVLOC  EQU     103                      AXIS0417
01D0                         END                              AXIS0418
```

NO ERRORS IN ABOVE ASSEMBLY.

AXIS
DUP FUNCTION COMPLETED.

```
                *****************************************************  AXLOG002
                *  IBM 1800 SUBROUTINES FOR CALCOMP 506/570.        *  AXLOG003
                *****************************************************  AXLOG004
                *                                                   *  AXLOG005
                *  SUBROUTINE AXLOG                                 *  AXLOG006
                *                                                   *  AXLOG007
                *  CALLING SEQUENCE                                 *  AXLOG008
                *  ----------------                                 *  AXLOG009
                *  1.FORTRAN                                        *  AXLOG010
                *     CALL AXLOG(X,Y,SIZE,THETA,EBC,NO,YMINL,NT,    *  AXLOG011
                *                K4,UNIT)                           *  AXLOG012
                *  2.ASSEMBLER                                      *  AXLOG013
                *     CALL     AXLOG                                *  AXLOG014
                *     DC       X          ABSCISSE AND              *  AXLOG015
                *     DC       Y          ORDINATE OF THE START OF  *  AXLOG016
                *                         THE AXIS                  *  AXLOG017
                *     DC       SIZE       LENGTH OF THE AXIS        *  AXLOG018
                *     DC       THETA      ANGLE OF THE AXIS         *  AXLOG019
                *     DC       EBC        LABEL OF THE AXIS         *  AXLOG020
                *     DC       NO         NUMBER OF CHARACTERS AND  *  AXLOG021
                *                         POSITION OF THE LABEL     *  AXLOG022
                *     DC       XMINL      MIN. LOG. VALUE FOR THE   *  AXLOG023
                *                         GRADUATION OF THE AXIS    *  AXLOG024
                *     DC       NT         TYPE OF SCALE             *  AXLOG025
                *     DC       K4         POINT NO. CORR. TO YMINL  *  AXLOG026
                *     DC       UNIT       LENGTH IN CM OF 1 DECADE  *  AXLOG027
                *                                                   *  AXLOG028
                *****************************************************  AXLOG029
0000     019D3587       ENT      AXLOG                                 AXLOG030
0000 0   0000     AXLOG DC       0                                     AXLOG031
0001 01  6D0001CF       STX  L1  XR1+1                                 AXLOG032
0003 01  6E0001D1       STX  L2  XR2+1                                 AXLOG033
0005 01  6F0001D3       STX  L3  XR3+1                                 AXLOG034
0007 01  65800000       LDX  I1  AXLOG                                 AXLOG035
0009 01  660001DA       LDX  L2  R                                     AXLOG036
000B 00  67800067       LDX  I3  TVLOC                                 AXLOG037
000D 00  CD800000       LDD  I1  0                                     AXLOG038
000F 0   DA00           STD   2  X-R                                   AXLOG039
0010 0   DAFC           STD   2  XX-R                                  AXLOG040
0011 00  CD800001       LDD  I1  1                                     AXLOG041
0013 0   DA02           STD   2  Y-R                                   AXLOG042
0014 0   DAFE           STD   2  YY-R                                  AXLOG043
0015 00  CD800002       LDD  I1  2                                     AXLOG044
0017 0   DA16           STD   2  SIZE-R                                AXLOG045
0018 00  CD800003       LDD  I1  3                                     AXLOG046
001A 0   DA18           STD   2  THETA-R                               AXLOG047
001B 0   C104           LD    1  4                                     AXLOG048
001C 0   D2F0           STO   2  EBC-R                                 AXLOG049
001D 00  C5800005       LD   I1  5                                     AXLOG050
001F 0   D259           STO   2  NO-R                                  AXLOG051
0020 01  4C280025       BSC  L   A0,+Z                                 AXLOG052
0022 01  6C000234       STX  L   IND                                   AXLOG053
0024 0   7005           MDX      A1                                    AXLOG054
0025 0   1010     A0    SLA      16                                    AXLOG055
0026 0   D25A           STO   2  IND-R                                 AXLOG056
0027 00  95800005       S    I1  5                                     AXLOG057
0029 0   D259           STO   2  NO-R                                  AXLOG058
002A 00  CD800006 A1    LDD  I1  6                                     AXLOG059
002C 0   DA1E           STD   2  YMINL-R                               AXLOG060
002D 00  C5800007       LD   I1  7                                     AXLOG061
```

```
0030 01 D40000BA          STO  L  NT+1                          AXLOG063
0032 00 C5800008          LD   I1 8                             AXLOG064
0034 0  1001              SLA     1                             AXLOG065
0035 01 D4000112          STO  L  KT4                           AXLOG066
0037 00 CD800009          LDD  I1 9                             AXLOG067
0039 0  DA14              STD   2 UNIT-R                        AXLOG068
                     *                                          AXLOG069
                     *    PRELIM. CALCULATIONS                  AXLOG070
                     *                                          AXLOG071
003A 20 064C4000          LIBF    FLD                           AXLOG072
003B 1  01F2              DC      THETA                         AXLOG073
003C 20 068A4080          LIBF    FSUB                          AXLOG074
003D 1  0226              DC      D90P                          AXLOG075
003E 20 068A3580          LIBF    FSTO                          AXLOG076
003F 1  01F4              DC      TH1                           AXLOG077
0040 20 064C4000          LIBF    FLD                           AXLOG078
0041 1  01F2              DC      THETA                         AXLOG079
0042 20 06517A00          LIBF    FMPY                          AXLOG080
0043 1  0202              DC      RHO                           AXLOG081
0044 20 068A3580          LIBF    FSTO                          AXLOG082
0045 1  01E8              DC      STH                           AXLOG083
0046 30 060D6895          CALL    FCOSN                         AXLOG084
0048 20 068A3580          LIBF    FSTO                          AXLOG085
0049 1  01E6              DC      CTH                           AXLOG086
004A 30 06889540          CALL    FSIN                          AXLOG087
004C 1  01E8              DC      STH                           AXLOG088
004D 20 068A3580          LIBF    FSTO                          AXLOG089
004E 1  01E8              DC      STH                           AXLOG090
004F 20 22559000          LIBF    SNR                           AXLOG091
0050 20 068A3580          LIBF    FSTO                          AXLOG092
0051 1  01E4              DC      STHO                          AXLOG093
                     *                                          AXLOG094
0052 0  61FC              LDX  1  -4                            AXLOG095
0053 20 064C4000     A2   LIBF    FLD                           AXLOG096
0054 1  01EE              DC      UNIT                          AXLOG097
0055 20 06517A27          LIBF    FMPYX                         AXLOG098
0056 1  01EA              DC      CTH+4                         AXLOG099
0057 20 068A35A7          LIBF    FSTOX                         AXLOG100
0058 1  01EE              DC      CTH1+4                        AXLOG101
0059 20 064C4000          LIBF    FLD                           AXLOG102
005A 1  01F0              DC      SIZE                          AXLOG103
005B 20 06517A27          LIBF    FMPYX                         AXLOG104
005C 1  01EA              DC      CTH+4                         AXLOG105
005D 20 06044127          LIBF    FADDX                         AXLOG106
005E 1  01DE              DC      X+4                           AXLOG107
005F 20 068A35A7          LIBF    FSTOX                         AXLOG108
0060 1  01E4              DC      XA+4                          AXLOG109
0061 0  7102              MDX  1  2                             AXLOG110
0062 0  70F0              MDX     A2                            AXLOG111
                     *                                          AXLOG112
0063 30 174D68C0          CALL    PLOT                          AXLOG113
0065 1  01E0              DC      XA                            AXLOG114
0066 1  01E2              DC      YA                            AXLOG115
0067 1  0231              DC      K3                            AXLOG116
0068 30 174D68C0          CALL    PLOT                          AXLOG117
006A 1  01DA              DC      X                             AXLOG118
006B 1  01DC              DC      Y                             AXLOG119
006C 1  0230              DC      K2                            AXLOG120
006D 0  10A0              SLT     32                            AXLOG121
006E 0  DA04              STD   2 XL-R          XL=0.           AXLOG122
006F 20 064C4000          LIBF    FLD                           AXLOG123
```

```
0070 1  01F8                    DC      YMINL                   AXLOG124
0071 20 091899C0                LIBF    IFIX                    AXLOG125
0072 0  D21C                    STO   2 XMNL1-R                 AXLOG126
0073 0  C21E                    LD    2 YMINL-R                 AXLOG127
0074 01 4C100082                BSC  L  A3,-                    AXLOG128
0076 0  C21C                    LD    2 XMNL1-R                 AXLOG129
0077 20 064D6063                LIBF    FLOAT                   AXLOG130
0078 20 06882640                LIBF    FSBR                    AXLOG131
0079 1  01F8                    DC      YMINL                   AXLOG132
007A 20 068A3580                LIBF    FSTO                    AXLOG133
007B 1  01FC                    DC      YMNL2                   AXLOG134
007C 0  C222                    LD    2 YMNL2-R                 AXLOG135
007D 01 4C100082                BSC  L  A3,-                    AXLOG136
007F 01 74FF01F6                MDX  L  XMNL1,-1                AXLOG137
0081 0  7000                    MDX     *                       AXLOG138
0082 0  C21C            A3      LD    2 XMNL1-R                 AXLOG139
0083 20 064D6063                LIBF    FLOAT                   AXLOG140
0084 20 06882640                LIBF    FSBR                    AXLOG141
0085 1  01F8                    DC      YMINL                   AXLOG142
0086 20 068A3580                LIBF    FSTO                    AXLOG143
0087 1  01FA                    DC      YMNL1                   AXLOG144
0088 20 06882640                LIBF    FSBR                    AXLOG145
0089 1  0206                    DC      D1EM5                   AXLOG146
008A 20 068A3580                LIBF    FSTO                    AXLOG147
008B 1  01FC                    DC      YMNL2                   AXLOG148
008C 0  C222                    LD    2 YMNL2-R                 AXLOG149
008D 01 4C10009D                BSC  L  A5,-                    AXLOG150
008F 20 064C4000                LIBF    FLD                     AXLOG151
0090 1  01FA                    DC      YMNL1                   AXLOG152
0091 20 068A4080                LIBF    FSUB                    AXLOG153
0092 1  021C                    DC      DP99                    AXLOG154
0093 20 068A3580                LIBF    FSTO                    AXLOG155
0094 1  01FC                    DC      YMNL2                   AXLOG156
0095 0  C222                    LD    2 YMNL2-R                 AXLOG157
0096 01 4C28009A                BSC  L  A4,+Z                   AXLOG158
0098 0  10A0                    SLT     32                      AXLOG159
0099 0  DA20                    STD   2 YMNL1-R                 AXLOG160
009A 01 740101F6        A4      MDX  L  XMNL1,1                 AXLOG161
009C 0  7000                    MDX     *                       AXLOG162
                        *                                       AXLOG163
009D 0  C21C            A5      LD    2 XMNL1-R                 AXLOG164
009E 20 064D6063                LIBF    FLOAT                   AXLOG165
009F 20 068A3580                LIBF    FSTO                    AXLOG166
00A0 1  01F6                    DC      XMNL1                   AXLOG167
00A1 20 064C4000                LIBF    FLD                     AXLOG168
00A2 1  01FA                    DC      YMNL1                   AXLOG169
00A3 20 06517A00                LIBF    FMPY                    AXLOG170
00A4 1  0204                    DC      CON                     AXLOG171
00A5 30 069D7540                CALL    FXPN                    AXLOG172
00A7 20 06517A00                LIBF    FMPY                    AXLOG173
00A8 1  0228                    DC      D100P                   AXLOG174
00A9 20 06044100                LIBF    FADD                    AXLOG175
00AA 1  020C                    DC      DP1                     AXLOG176
00AB 20 091899C0                LIBF    IFIX                    AXLOG177
00AC 20 064D6063                LIBF    FLOAT                   AXLOG178
00AD 20 06109940                LIBF    FDIV                    AXLOG179
00AE 1  0228                    DC      D100P                   AXLOG180
00AF 20 068A3580                LIBF    FSTO                    AXLOG181
00B0 1  01FE                    DC      YMN1                    AXLOG182
                        *                                       AXLOG183
                        *       BEGIN TO CALCULATE AND DESIGN THE SCALE  AXLOG184
```

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                        *
00B1 0  C008            LD      NT+1                                    AXLOG185
00B2 0  9258            S     2 K16-R                                   AXLOG186
00B3 01 4C10018B        BSC   L A30,-                                   AXLOG187
00B5 0  D004            STO     NT+1                                    AXLOG188
00B6 30 230424C7        CALL    TABLG                                   AXLOG189
00B8                    ORG     *-2                                     AXLOG190
00B6 0  6500            DC      /6500       MEANS   LDX  L1 TABLG      AXLOG191
00B7    0001            BSS     1                                       AXLOG192
00B8 0  7150            MDX   1 64+16                                   AXLOG193
00B9 00 CD000000    NT  LDD   L1 *-*                                    AXLOG194
00BB 0  9256            S     2 K2-R                                    AXLOG195
00BC 0  D052            STO     NPJ+1                                   AXLOG196
00BD 0  1090            SLT     16                                      AXLOG197
00BE 0  9050            S       NPJ+1                                   AXLOG198
00BF 0  D252            STO   2 KN2-R                                   AXLOG199
00C0 0  CA20        A6  LDD   2 YMNL1-R                                 AXLOG200
00C1 0  DA22            STD   2 YMNL2-R                                 AXLOG201
00C2 0  61FC        A65 LDX   1 -4                                      AXLOG202
00C3 20 064C49C0    A7  LIBF    FLDX                                    AXLOG203
00C4 1  01E8            DC      STH0+4                                  AXLOG204
00C5 20 06517A00        LIBF    FMPY                                    AXLOG205
00C6 1  020E            DC      DMP15                                   AXLOG206
00C7 01 74000234        MDX   L IND,0                                   AXLOG207
00C9 20 22559000        LIBF    SNR                                     AXLOG208
00CA 20 06044127        LIBF    FADDX                                   AXLOG209
00CB 1  01DE            DC      X+4                                     AXLOG210
00CC 20 068A35A7        LIBF    FSTOX                                   AXLOG211
00CD 1  01E4            DC      XA+4                                    AXLOG212
00CE 0  7102            MDX   1 2                                       AXLOG213
00CF 0  70F3            MDX     A7                                      AXLOG214
                        *                                               AXLOG215
00D0 30 174D68C0        CALL    PLOT                                    AXLOG216
00D2 1  01E0            DC      XA                                      AXLOG217
00D3 1  01E2            DC      YA                                      AXLOG218
00D4 1  0230            DC      K2                                      AXLOG219
00D5 30 174D68C0        CALL    PLOT                                    AXLOG220
00D7 1  01DA            DC      X                                       AXLOG221
00D8 1  01DC            DC      Y                                       AXLOG222
00D9 1  0230            DC      K2                                      AXLOG223
00DA 0  C0DF            LD      NT+1                                    AXLOG224
00DB 01 4C100192        BSC   L A31,-                                   AXLOG225
00DD 0  C034            LD      KT4                                     AXLOG226
00DE 0  9256            S     2 K2-R                                    AXLOG227
00DF 01 4C08014D        BSC   L A20,+                                   AXLOG228
                        *                                               AXLOG229
00E1 0  61FC            LDX   1 -4                                      AXLOG230
00E2 20 064C4000    A8  LIBF    FLD                                     AXLOG231
00E3 1  021E            DC      D1P                                     AXLOG232
00E4 01 74000234        MDX   L IND,0                                   AXLOG233
00E6 0  7002            MDX     A9                                      AXLOG234
00E7 20 064C4000        LIBF    FLD                                     AXLOG235
00E8 1  0216            DC      DMP4                                    AXLOG236
00E9 20 06517A27    A9  LIBF    FMPYX                                   AXLOG237
00EA 1  01E8            DC      STH0+4                                  AXLOG238
00EB 20 06044127        LIBF    FADDX                                   AXLOG239
00EC 1  01DE            DC      X+4                                     AXLOG240
00ED 20 068A35A7        LIBF    FSTOX                                   AXLOG241
00EE 1  01E4            DC      XA+4                                    AXLOG242
00EF 20 064C4000        LIBF    FLD                                     AXLOG243
00F0 1  020A            DC      DMP1                                    AXLOG244
                                                                        AXLOG245
```

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00F1 20 06517A27          LIBF    FMPYX                                  AXLOG246
00F2 1  01EA              DC      CTH+4                                  AXLOG247
00F3 20 06044127          LIBF    FADDX                                  AXLOG248
00F4 1  01E4              DC      XA+4                                   AXLOG249
00F5 20 068A35A7          LIBF    FSTOX                                  AXLOG250
00F6 1  01E4              DC      XA+4                                   AXLOG251
00F7 0  7102              MDX   1 2                                      AXLOG252
00F8 0  70E9              MDX     A8                                     AXLOG253
00F9 20 064C4000          LIBF    FLD                                    AXLOG254
00FA 1  01FE              DC      YMN1                                   AXLOG255
00FB 20 06044100          LIBF    FADD                                   AXLOG256
00FC 1  0208              DC      DP001                                  AXLOG257
00FD 20 068A3580          LIBF    FSTO                                   AXLOG258
00FE 1  0200              DC      YMN2                                   AXLOG259
00FF 30 15914099          CALL    NUMBR                                  AXLOG260
0101 1  01E0              DC      XA                                     AXLOG261
0102 1  01E2              DC      YA                                     AXLOG262
0103 1  0210              DC      DP21                                   AXLOG263
0104 1  01F4              DC      TH1                                    AXLOG264
0105 1  0200              DC      YMN2                                   AXLOG265
0106 1  0230              DC      K2                                     AXLOG266
0107 01 C4000112          LD    L KT4                                    AXLOG267
0109 0  9252              S     2 KN2-R                                  AXLOG268
010A 01 4C300144          BSC   L A12,-Z                                AXLOG269
010C 30 230424C7    A93   CALL    TABLG       MEANS  LDX  L1 TABLG      AXLOG270
010E                      ORG     *-2                                    AXLOG271
010C 0  6500              DC      /6500                                  AXLOG272
010D    0001              BSS     1                                      AXLOG273
010E 00 75000000    NPJ   MDX   L1 *-*                                  AXLOG274
0110 0  71FE              MDX   1 -2                                     AXLOG275
0111 20 064C49C0          LIBF    FLDX                                   AXLOG276
0112 0  0000        KT4   DC      *-*                                    AXLOG277
0113 01 74020112          MDX   L KT4,2                                  AXLOG278
0115 20 06044100          LIBF    FADD                                   AXLOG279
0116 1  01FE              DC      YMN1                                   AXLOG280
0117 20 068A3580          LIBF    FSTO                                   AXLOG281
0118 1  01FE              DC      YMN1                                   AXLOG282
0119 30 064D5000          CALL    FLN                                    AXLOG283
011B 20 06109940          LIBF    FDIV                                   AXLOG284
011C 1  0204              DC      CON                                    AXLOG285
011D 20 068A3580          LIBF    FSTO                                   AXLOG286
011E 1  01FA              DC      YMNL1                                  AXLOG287
                    *                                                    AXLOG288
011F 20 068A4080    A95   LIBF    FSUB                                   AXLOG289
0120 1  01FC              DC      YMNL2                                  AXLOG290
0121 20 068A3580          LIBF    FSTO                                   AXLOG291
0122 1  0200              DC      YMN2                                   AXLOG292
0123 0  61FA        A96   LDX   1 -6                                     AXLOG293
0124 20 064C4000    A10   LIBF    FLD                                    AXLOG294
0125 1  0200              DC      YMN2                                   AXLOG295
0126 20 06517A27          LIBF    FMPYX                                  AXLOG296
0127 1  01F0              DC      CTH1+6                                 AXLOG297
0128 20 06044127          LIBF    FADDX                                  AXLOG298
0129 1  01E0              DC      X+6                                    AXLOG299
012A 20 068A35A7          LIBF    FSTOX                                  AXLOG300
012B 1  01E0              DC      X+6                                    AXLOG301
012C 0  7102              MDX   1 2                                      AXLOG302
012D 0  70F6              MDX     A10                                    AXLOG303
                    *                                                    AXLOG304
012E 20 064C4000          LIBF    FLD                                    AXLOG305
012F 1  01F0              DC      SIZE                                   AXLOG306
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0130 20 06044100          LIBF    FADD                    AXLOG307
0131 1  020C              DC      DP1                     AXLOG308
0132 20 068A4080          LIBF    FSUB                    AXLOG309
0133 1  01DE              DC      XL                      AXLOG310
0134 20 068A3580          LIBF    FSTO                    AXLOG311
0135 1  0200              DC      YMN2                    AXLOG312
0136 0  C226              LD    2 YMN2-R                  AXLOG313
0137 01 4C2801A5          BSC  L  A40,+Z                  AXLOG314
0139 30 174D68C0          CALL    PLOT                    AXLOG315
013B 1  01DA              DC      X                       AXLOG316
013C 1  01DC              DC      Y                       AXLOG317
013D 1  0231              DC      K3                      AXLOG318
013E 01 C40000BA          LD   L  NT+1                    AXLOG319
0140 01 4C2800C0          BSC  L  A6,+Z                   AXLOG320
0142 01 4C0000C2          BSC  L  A65                     AXLOG321
0144 0  C256        A12   LD    2 K2-R                    AXLOG322
0145 0  D0CC              STO     KT4                     AXLOG323
0146 0  10A0              SLT     32                      AXLOG324
0147 0  DA20              STD   2 YMNL1-R                 AXLOG325
0148 0  CA44              LDD   2 D1P-R                   AXLOG326
0149 0  DA24              STD   2 YMN1-R                  AXLOG327
014A 20 064C4000          LIBF    FLD                     AXLOG328
014B 1  021E              DC      D1P                     AXLOG329
014C 0  70D2              MDX     A95                     AXLOG330
                    *                                     AXLOG331
014D 0  61FC        A20   LDX   1 -4                      AXLOG332
014E 20 064C4000    A21   LIBF    FLD                     AXLOG333
014F 1  0220              DC      D1P3                    AXLOG334
0150 01 74000234          MDX  L  IND,0                   AXLOG335
0152 0  7002              MDX     A22                     AXLOG336
0153 20 064C4000          LIBF    FLD                     AXLOG337
0154 1  021A              DC      DMP82                   AXLOG338
0155 20 06517A27    A22   LIBF    FMPYX                   AXLOG339
0156 1  01E8              DC      STH0+4                  AXLOG340
0157 20 06044127          LIBF    FADDX                   AXLOG341
0158 1  01DE              DC      X+4                     AXLOG342
0159 20 068A35A7          LIBF    FSTOX                   AXLOG343
015A 1  01E4              DC      XA+4                    AXLOG344
015B 20 064C4000          LIBF    FLD                     AXLOG345
015C 1  020A              DC      DMP1                    AXLOG346
015D 20 06517A27          LIBF    FMPYX                   AXLOG347
015E 1  01EA              DC      CTH+4                   AXLOG348
015F 20 06044127          LIBF    FADDX                   AXLOG349
0160 1  01E4              DC      XA+4                    AXLOG350
0161 20 068A35A7          LIBF    FSTOX                   AXLOG351
0162 1  01E4              DC      XA+4                    AXLOG352
0163 0  7102              MDX   1 2                       AXLOG353
0164 0  70E9              MDX     A21                     AXLOG354
0165 30 22A14093          CALL    SYMBL                   AXLOG355
0167 1  01E0              DC      XA                      AXLOG356
0168 1  01E2              DC      YA                      AXLOG357
0169 1  0214              DC      DP28                    AXLOG358
016A 1  01F4              DC      TH1                     AXLOG359
016B 1  0235              DC      EBC1                    AXLOG360
016C 1  022F              DC      KM2                     AXLOG361
016D 0  61FC              LDX   1 -4                      AXLOG362
016E 20 064C4000    A23   LIBF    FLD                     AXLOG363
016F 1  0210              DC      DP21                    AXLOG364
0170 20 06517A27          LIBF    FMPYX                   AXLOG365
0171 1  01EA              DC      CTH+4                   AXLOG366
0172 20 06044127          LIBF    FADDX                   AXLOG367
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0173  1  01E4              DC      XA+4                AXLOG368
0174 20  068A35A7          LIBF    FSTOX               AXLOG369
0175  1  01E4              DC      XA+4                AXLOG370
0176  0  7102              MDX   1 2                   AXLOG371
0177  0  70F6              MDX     A23                 AXLOG372
0178 30  15914099          CALL    NUMBR               AXLOG373
017A  1  01E0              DC      XA                  AXLOG374
017B  1  01E2              DC      YA                  AXLOG375
017C  1  0210              DC      DP21                AXLOG376
017D  1  01F4              DC      TH1                 AXLOG377
017E  1  01F6              DC      XMNL1               AXLOG378
017F  1  022E              DC      KM1                 AXLOG379
0180 20  064C4000          LIBF    FLD                 AXLOG380
0181  1  01F6              DC      XMNL1               AXLOG381
0182 20  06044100          LIBF    FADD                AXLOG382
0183  1  021E              DC      D1P                 AXLOG383
0184 20  068A3580          LIBF    FSTO                AXLOG384
0185  1  01F6              DC      XMNL1               AXLOG385
0186 01  C40000BA          LD    L NT+1                AXLOG386
0188 01  4C1001A1          BSC   L A33,-               AXLOG387
018A  0  7081              MDX     A93                 AXLOG388
018B  0  D251        A30   STO   2 J-R                 AXLOG389
018C  0  D250              STO   2 J1-R                AXLOG390
018D  0  1010              SLA     16                  AXLOG391
018E 01  D40000BA          STO   L NT+1                AXLOG392
0190 01  4C0000C2          BSC   L A65                 AXLOG393
0192  0  C250        A31   LD    2 J1-R                AXLOG394
0193  0  9251              S     2 J-R                 AXLOG395
0194 01  4C280199          BSC   L A32,+Z              AXLOG396
0196  0  C256              LD    2 K2-R                AXLOG397
0197  0  D250              STO   2 J1-R                AXLOG398
0198  0  70B4              MDX     A20                 AXLOG399
0199 01  7402022A    A32   MDX   L J1,2                AXLOG400
019B 20  064C4000          LIBF    FLD                 AXLOG401
019C  1  01F6              DC      XMNL1               AXLOG402
019D 20  06044100          LIBF    FADD                AXLOG403
019E  1  021E              DC      D1P                 AXLOG404
019F 20  068A3580          LIBF    FSTO                AXLOG405
01A0  1  01F6              DC      XMNL1               AXLOG406
01A1  0  CA44        A33   LDD   2 D1P-R                AXLOG407
01A2  0  DA26              STD   2 YMN2-R              AXLOG408
01A3 01  4C000123          BSC   L A96                 AXLOG409
                     *                                 AXLOG410
01A5  0  61FC        A40   LDX   1 -4                   AXLOG411
01A6  0  C259        A41   LD    2 NO-R                AXLOG412
01A7 20  064D6063          LIBF    FLOAT               AXLOG413
01A8 20  06517A00          LIBF    FMPY                AXLOG414
01A9  1  0212              DC      DP24                AXLOG415
01AA 20  06882640          LIBF    FSBR                AXLOG416
01AB  1  01F0              DC      SIZE                AXLOG417
01AC 20  06517A00          LIBF    FMPY                AXLOG418
01AD  1  0218              DC      DP5                 AXLOG419
01AE 20  06517A27          LIBF    FMPYX               AXLOG420
01AF  1  01EA              DC      CTH+4               AXLOG421
01B0 20  06044127          LIBF    FADDX               AXLOG422
01B1  1  01DA              DC      XX+4                AXLOG423
01B2 20  068A35A7          LIBF    FSTOX               AXLOG424
01B3  1  01E4              DC      XA+4                AXLOG425
01B4 01  74000234          MDX   L IND,0               AXLOG426
01B6  0  7003              MDX     A42                 AXLOG427
01B7 20  064C4000          LIBF    FLD                 AXLOG428
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01B8 1  0224                DC      DM1P7                    AXLOG429
01B9 0  7002                MDX     A43                      AXLOG430
01BA 20 064C4000    A42     LIBF    FLD                      AXLOG431
01BB 1  0222                DC      D1P42                    AXLOG432
01BC 20 06517A27    A43     LIBF    FMPYX                    AXLOG433
01BD 1  01E8                DC      STH0+4                   AXLOG434
01BE 20 06044127            LIBF    FADDX                    AXLOG435
01BF 1  01E4                DC      XA+4                     AXLOG436
01C0 20 068A35A7            LIBF    FSTOX                    AXLOG437
01C1 1  01E4                DC      XA+4                     AXLOG438
01C2 0  7102                MDX   1 2                        AXLOG439
01C3 0  70E2                MDX     A41                      AXLOG440
                    *                                        AXLOG441
01C4 30 22A14093            CALL    SYMBL                    AXLOG442
01C6 1  01E0                DC      XA                       AXLOG443
01C7 1  01E2                DC      YA                       AXLOG444
01C8 1  0214                DC      DP28                     AXLOG445
01C9 1  01F2                DC      THETA                    AXLOG446
01CA 0  0000        EBC     DC      *-*                      AXLOG447
01CB 1  0233                DC      NO                       AXLOG448
                    *                                        AXLOG449
01CC 01 740A0000            MDX   L AXLOG,10                 AXLOG450
01CE 00 65000000    XR1     LDX   L1 *-*                     AXLOG451
01D0 00 66000000    XR2     LDX   L2 *-*                     AXLOG452
01D2 00 67000000    XR3     LDX   L3 *-*                     AXLOG453
01D4 01 4C800000            BSC   I  AXLOG                   AXLOG454
                    *                                        AXLOG455
                    *       CONSTANTS                        AXLOG456
                    *                                        AXLOG457
01D6 00 00000000    XX      DEC     0                        AXLOG458
01D8 00 00000000    YY      DEC     0                        AXLOG459
01DA 00 00000000    X       DEC     0                        AXLOG460
01DC 00 00000000    Y       DEC     0                        AXLOG461
01DE 00 00000000    XL      DEC     0                        AXLOG462
01E0 00 00000000    XA      DEC     0                        AXLOG463
01E2 00 00000000    YA      DEC     0                        AXLOG464
01E4 00 00000000    STH0    DEC     0                        AXLOG465
01E6 00 00000000    CTH     DEC     0                        AXLOG466
01E8 00 00000000    STH     DEC     0                        AXLOG467
01EA 00 00000000    CTH1    DEC     0                        AXLOG468
01EC 00 00000000    STH1    DEC     0                        AXLOG469
01EE 00 00000000    UNIT    DEC     0                        AXLOG470
01F0 00 00000000    SIZE    DEC     0                        AXLOG471
01F2 00 00000000    THETA   DEC     0                        AXLOG472
01F4 00 00000000    TH1     DEC     0                        AXLOG473
01F6 00 00000000    XMNL1   DEC     0                        AXLOG474
01F8 00 00000000    YMINL   DEC     0                        AXLOG475
01FA 00 00000000    YMNL1   DEC     0                        AXLOG476
01FC 00 00000000    YMNL2   DEC     0                        AXLOG477
01FE 00 00000000    YMN1    DEC     0                        AXLOG478
0200 00 00000000    YMN2    DEC     0                        AXLOG479
0202 00 477D1A7B    RHO     DEC     0.017453294              AXLOG480
0204 00 49AEC682    CON     DEC     2.302585                 AXLOG481
0206 00 53E2D670    D1EM5   DEC     0.00001                  AXLOG482
0208 00 41893777    DP001   DEC     0.001                    AXLOG483
020A 00 99999A7D    DMP1    DEC     -0.1                     AXLOG484
020C 00 6666667D    DP1     DEC     0.1                      AXLOG485
020E 00 B333347E    DMP15   DEC     -0.15                    AXLOG486
0210 00 6B851E7E    DP21    DEC     0.21                     AXLOG487
0212 00 7AE1477E    DP24    DEC     0.24                     AXLOG488
0214 00 47AE147F    DP28    DEC     0.28                     AXLOG489
```

```
0216  00  99999A7F    DMP4    DEC     -0.40       AXLOG490
0218  00  40000080    DP5     DEC     0.5         AXLOG491
021A  00  970A3E80    DMP82   DEC     -0.82       AXLOG492
021C  00  7EB85180    DP99    DEC     0.99        AXLOG493
021E  00  40000081    D1P     DEC     1.          AXLOG494
0220  00  53333381    D1P3    DEC     1.3         AXLOG495
0222  00  5AE14781    D1P42   DEC     1.42        AXLOG496
0224  00  93333481    DM1P7   DEC     -1.7        AXLOG497
0226  00  5A000087    D90P    DEC     90.         AXLOG498
0228  00  64000087    D100P   DEC     100.        AXLOG499
022A  0   0000        J1      DC      0           AXLOG500
022B  0   0000        J       DC      0           AXLOG501
022C  0   0000        KN2     DC      0           AXLOG502
022D  0   0001        K1      DC      1           AXLOG503
022E  0   FFFF        KM1     DC      -1          AXLOG504
022F  0   FFFE        KM2     DC      -2          AXLOG505
0230  0   0002        K2      DC      2           AXLOG506
0231  0   0003        K3      DC      3           AXLOG507
0232  0   0010        K16     DC      16          AXLOG508
0233  0   0000        NO      DC      0           AXLOG509
0234  0   0000        IND     DC      0           AXLOG510
0235      0002        EBC1    EBC     .10.        AXLOG511
01DA                  R       EQU     X           AXLOG512
0067                  TVLOC   EQU     103         AXLOG513
0236                          END                 AXLOG514
```

NO ERRORS IN ABOVE ASSEMBLY.

AXLOG
DUP FUNCTION COMPLETED

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```
                *****************************************************  LINE0002
                *  IBM 1800 SUBROUTINES FOR CALCOMP 506/570.        *  LINE0003
                *****************************************************  LINE0004
                *                                                   *  LINE0005
                *  SUBROUTINE LINE/DASH                             *  LINE0006
                *                                                   *  LINE0007
                *  CALLING SEQUENCE                                 *  LINE0008
                *  ----------------                                 *  LINE0009
                *  1.FORTRAN                                        *  LINE0010
                *    CALL LINE(X,Y,N,NX,NY)                         *  LINE0011
                *    CALL DASH(X,Y,N,NX,NY)                         *  LINE0012
                *  2.ASSEMBLER                                      *  LINE0013
                *    CALL    LINE                                   *  LINE0014
                *    DC      X          MATRIX OF X-VALUE           *  LINE0015
                *    DC      Y          MATRIX OF Y-VALUE           *  LINE0016
                *    DC      N          NUMBER OF VALUES            *  LINE0017
                *    DC      NX         STEP FOR MATRIX X           *  LINE0018
                *    DC      NY         STEP FOR MATRIX Y           *  LINE0019
                *    CALL    DASH                                   *  LINE0020
                *    DC      X                                      *  LINE0021
                *    DC      Y                                      *  LINE0022
                *    DC      N                                      *  LINE0023
                *    DC      NX                                     *  LINE0024
                *    DC      NY                                     *  LINE0025
                *                                                   *  LINE0026
                *****************************************************  LINE0027
0000     13255140          ENT     LINE                                LINE0028
0006     04062200          ENT     DASH                                LINE0029
0000 0   0000        LINE  DC      0                                   LINE0030
0001 0   693B              STX   1 XR1+1                               LINE0031
0002 01  65800000          LDX   I1 LINE                               LINE0032
0004 0   C01E              LD      PLOT+1                              LINE0033
0005 0   7005              MDX     L1                                  LINE0034
0006 0   0000        DASH  DC      0                                   LINE0035
0007 0   6935              STX   1 XR1+1                               LINE0036
0008 01  65800006          LDX   I1 DASH                               LINE0037
000A 0   C038              LD      PLTIR+1                             LINE0038
000B 0   D027        L1    STO     CALL+1                              LINE0039
000C 0   6A32              STX   2 XR2+1                               LINE0040
000D 0   C100              LD    1 0                                   LINE0041
000E 0   D015              STO     X                                   LINE0042
000F 0   D024              STO     X1                                  LINE0043
0010 0   C101              LD    1 1                                   LINE0044
0011 0   D013              STO     Y                                   LINE0045
0012 0   D022              STO     Y1                                  LINE0046
0013 00  C5800002          LD    I1 2                                  LINE0047
0015 01  4C08003A          BSC   L  EXIT,+                             LINE0048
0017 0   D001              STO     *+1                                 LINE0049
0018 00  66000000          LDX   L2 *-*          XR2=N                 LINE0050
001A 00  C5800003          LD    I1 3                                  LINE0051
001C 0   1001              SLA     1                                   LINE0052
001D 0   D028              STO     NX1                                 LINE0053
001E 00  C5800004          LD    I1 4                                  LINE0054
0020 0   1001              SLA     1                                   LINE0055
0021 0   D025              STO     NY1                                 LINE0056
0022 30  174D68C0    PLOT  CALL    PLOT                                LINE0057
0024 0   0000        X     DC      *-*                                 LINE0058
0025 0   0000        Y     DC      *-*                                 LINE0059
0026 1   0045              DC      K3                                  LINE0060
0027 0   C01C              LD      K2                                  LINE0061
0028 0   D019              STO     I                                   LINE0062
```

```
0029 0  72FF        L3    MDX   2 -1                                  LINE0063
002A 0  7001              MDX     L4                                  LINE0064
002B 0  700E              MDX     EXIT                                LINE0065
002C 0  C007        L4    LD      X1                                  LINE0066
002D 0  9018              S       NX1                                 LINE0067
002E 0  D005              STO     X1                                  LINE0068
002F 0  C005              LD      Y1                                  LINE0069
0030 0  9016              S       NY1                                 LINE0070
0031 0  D003              STO     Y1                                  LINE0071
0032 30 174D68C0    CALL  CALL    PLOT                                LINE0072
0034 0  0000        X1    DC      *-*                                 LINE0073
0035 0  0000        Y1    DC      *-*                                 LINE0074
0036 1  0042              DC      I                                   LINE0075
0037 0  1010              SLA     16                                  LINE0076
0038 0  D009              STO     I                                   LINE0077
0039 0  70EF              MDX     L3                                  LINE0078
003A 0  7105        EXIT  MDX   1 5     INCREMENT RETURN ADDRESS      LINE0079
003B 0  69C4              STX   1 LINE                                LINE0080
003C 00 65000000    XR1   LDX   L1 *-*  RESTORE                       LINE0081
003E 00 66000000    XR2   LDX   L2 *-*                                LINE0082
0040 01 4C800000          BSC   I LINE  RETURN                        LINE0083
0042 30 174E3259    PLTIR CALL    PLTIR                               LINE0084
0042                I     EQU     PLTIR                               LINE0085
0044 0  0002        K2    DC      2                                   LINE0086
0045 0  0003        K3    DC      3                                   LINE0087
0046 0  0000        NX1   DC      0                                   LINE0088
0047 0  0000        NY1   DC      0                                   LINE0089
0048                      END                                         LINE0090
```

NO ERRORS IN ABOVE ASSEMBLY.
LINE DASH
DUP FUNCTION COMPLETED

```
                        ************************************************** MARK0002
                        *  IBM 1800 SUBROUTINES FOR CALCOMP 506/570.     * MARK0003
                        ************************************************** MARK0004
                        *                                                * MARK0005
                        *  SUBROUTINE MARK                               * MARK0006
                        *                                                * MARK0007
                        *  CALLING SEQUENCE                              * MARK0008
                        *  ----------------                              * MARK0009
                        *  1.FORTRAN                                     * MARK0010
                        *    CALL MARK(X,Y,N,NX,NY,EBC)                  * MARK0011
                        *  2.ASSEMBLER                                   * MARK0012
                        *    CALL    MARK                                * MARK0013
                        *    DC      X          MATRIX OF X-VALUE        * MARK0014
                        *    DC      Y          MATRIX OF Y-VALUE        * MARK0015
                        *    DC      N          NUMBER OF VALUES         * MARK0016
                        *    DC      NX         STEP FOR X-MATRIX        * MARK0017
                        *    DC      NY         STEP FOR Y-MATRIX        * MARK0018
                        *    DC      EBC        SYMBOL TO BE DESIGNED    * MARK0019
                        *                       (LEFT HAND SIDE ADJUSTED)* MARK0020
                        ************************************************** MARK0021
0000     14059480       ENT     MARK                                      MARK0022
0000 0   0000    MARK   DC      0                                         MARK0023
0001 0   692B           STX   1 X1+1                                      MARK0024
0002 0   6A2C           STX   2 X2+1                                      MARK0025
0003 01  65800000       LDX   I1 MARK                                     MARK0026
0005 0   C100           LD    1 0                                         MARK0027
0006 0   D015           STO     X                                         MARK0028
0007 0   C101           LD    1 1                                         MARK0029
0008 0   D014           STO     Y                                         MARK0030
0009 00  C5800002       LD    I1 2                                        MARK0031
000B 01  4C08002A       BSC   L  EXIT,+                                   MARK0032
000D 0   D001           STO     *+1                                       MARK0033
000E 00  66000000       LDX   L2 *-*                                      MARK0034
0010 00  C5800003       LD    I1 3                                        MARK0035
0012 0   1001           SLA     1                                         MARK0036
0013 0   D023           STO     NX1                                       MARK0037
0014 00  C5800004       LD    I1 4                                        MARK0038
0016 0   1001           SLA     1                                         MARK0039
0017 0   D020           STO     NY1                                       MARK0040
0018 0   C105           LD    1 5                                         MARK0041
0019 0   D006           STO     EBC                                       MARK0042
001A 30  22A14093  M2   CALL    SYMBL                                     MARK0043
001C 0   0000      X    DC      *-*                                       MARK0044
001D 0   0000      Y    DC      *-*                                       MARK0045
001E 1   0032           DC      DP3                                       MARK0046
001F 1   0034           DC      D0                                        MARK0047
0020 0   0000      EBC  DC      *-*                                       MARK0048
0021 1   0036           DC      K1                                        MARK0049
0022 0   C0F9           LD      X                                         MARK0050
0023 0   9013           S       NX1                                       MARK0051
0024 0   D0F7           STO     X                                         MARK0052
0025 0   C0F7           LD      Y                                         MARK0053
0026 0   9011           S       NY1                                       MARK0054
0027 0   D0F5           STO     Y                                         MARK0055
0028 0   72FF           MDX   2 -1                                        MARK0056
0029 0   70F0           MDX     M2                                        MARK0057
002A 01  74050000  EXIT MDX   L  MARK,5                                  MARK0058
002C 00  65000000  X1   LDX   L1 *-*                                     MARK0059
002E 00  66000000  X2   LDX   L2 *-*                                     MARK0060
0030 01  4C800000       BSC   I  MARK                                     MARK0061
0032 00  4CCCCC7F  DP3  DEC     0.3                                       MARK0062
```

```
0034 00 00000000    D0      DEC     0          MARK0063
0036 0  0001        K1      DC      1          MARK0064
0037 0  0000        NX1     DC      0          MARK0065
0038 0  0000        NY1     DC      0          MARK0066
003A                        END                MARK0067

     NO ERRORS IN ABOVE ASSEMBLY.
MARK
DUP FUNCTION COMPLETED
```

```
*****************************************************  SCLIN002
*  IBM 1800 SUBROUTINES FOR CALCOMP 506/570.        *  SCLIN003
*****************************************************  SCLIN004
*                                                   *  SCLIN005
*  SUBROUTINE SCLIN/SCDAS                           *  SCLIN006
*                                                   *  SCLIN007
*  CALLING SEQUENCE                                 *  SCLIN008
*  ----------------                                 *  SCLIN009
*  1.FORTRAN                                        *  SCLIN010
*     CALL SCLIN(X,Y,N,NX,NY,XMIN,DX,YMIN,DY)       *  SCLIN011
*     CALL SCDAS(X,Y,N,NX,NY,XMIN,DX,YMIN,DY)       *  SCLIN012
*  2.ASSEMBLER                                      *  SCLIN013
*     CALL     SCLIN                                *  SCLIN014
*     DC       X          MATRIX X                  *  SCLIN015
*     DC       Y          MATRIX Y                  *  SCLIN016
*     DC       N          NUMBER OF VALUES OF X,Y   *  SCLIN017
*     DC       NX         STEP FOR X-MATRIX         *  SCLIN018
*     DC       NY         STEP FOR Y-MATRIX         *  SCLIN019
*     DC       XMIN       MIN.FUNCT.VALUE OF X-AXIS*  SCLIN020
*     DC       DX         FUNCT.INCR.OF X PER 1 CM  *  SCLIN021
*     DC       YMIN       MIN.FUNCT.VALUE OF Y-AXIS*  SCLIN022
*     DC       DY         FUNCT.INCR.OF Y PER 1 CM  *  SCLIN023
*     CALL     SCDAS                                *  SCLIN024
*     DC       X                                    *  SCLIN025
*     .                                             *  SCLIN026
*     .                                             *  SCLIN027
*     .                                             *  SCLIN028
*     DC       DY                                   *  SCLIN029
*                                                   *  SCLIN030
*****************************************************  SCLIN031
0000     220D3255          ENT     SCLIN                    SCLIN032
0006     220C4062          ENT     SCDAS                    SCLIN033
0000 0   0000      SCLIN DC      0                          SCLIN034
0001 0   6946            STX   1 XR1+1                      SCLIN035
0002 01  65800000        LDX   I1 SCLIN                     SCLIN036
0004 0   C028            LD      PLOT+1                     SCLIN037
0005 0   7005            MDX     S1                         SCLIN038
0006 0   0000      SCDAS DC      0                          SCLIN039
0007 0   6940            STX   1 XR1+1                      SCLIN040
0008 01  65800006        LDX   I1 SCDAS                     SCLIN041
000A 0   C058            LD      PLTIR+1                    SCLIN042
000B 0   D032      S1    STO     CALL+1                     SCLIN043
000C 0   6A3D            STX   2 XR2+1                      SCLIN044
000D 0   6B3E            STX   3 XR3+1                      SCLIN045
000E 0   C100            LD    1 0                          SCLIN046
000F 0   D041            STO     X                          SCLIN047
0010 0   C101            LD    1 1                          SCLIN048
0011 0   D047            STO     Y                          SCLIN049
0012 00  C5800002        LD    I1 2                         SCLIN050
0014 01  4C080045        BSC   L  EXIT,+                    SCLIN051
0016 0   D001            STO     *+1                        SCLIN052
0017 00  66000000        LDX   L2 *-*          XR2=N        SCLIN053
0019 00  C5800003        LD    I1 3                         SCLIN054
001B 0   1001            SLA     1                          SCLIN055
001C 0   D049            STO     NX1                        SCLIN056
001D 00  C5800004        LD    I1 4                         SCLIN057
001F 0   1001            SLA     1                          SCLIN058
0020 0   D046            STO     NY1                        SCLIN059
0021 0   C105            LD    1 5                          SCLIN060
0022 0   D030            STO     XMIN                       SCLIN061
0023 0   C106            LD    1 6                          SCLIN062
```

```
0024 0  D030          STO     DX                  SCLIN063
0025 0  C107          LD    1 7                   SCLIN064
0026 0  D034          STO     YMIN                SCLIN065
0027 0  C108          LD    1 8                   SCLIN066
0028 0  D034          STO     DY                  SCLIN067
0029 00 67800067      LDX   I3 TVLOC              SCLIN068
002B 0  4023          BSI     REDCT               SCLIN069
002C 30 174D68C0  PLOT CALL   PLOT                SCLIN070
002E 1  0068          DC      X1                  SCLIN071
002F 1  006A          DC      Y1                  SCLIN072
0030 1  0065          DC      K3                  SCLIN073
0031 0  C032          LD      K2                  SCLIN074
0032 0  D02F          STO     I                   SCLIN075
0033 0  72FF      S2  MDX   2 -1                  SCLIN076
0034 0  7001          MDX     S3                  SCLIN077
0035 0  700F          MDX     EXIT                SCLIN078
0036 0  C01A      S3  LD      X                   SCLIN079
0037 0  902E          S       NX1                 SCLIN080
0038 0  D018          STO     X                   SCLIN081
0039 0  C01F          LD      Y                   SCLIN082
003A 0  902C          S       NY1                 SCLIN083
003B 0  D01D          STO     Y                   SCLIN084
003C 0  4012          BSI     REDCT               SCLIN085
003D 30 174D68C0  CALL CALL   PLOT                SCLIN086
003F 1  0068          DC      X1                  SCLIN087
0040 1  006A          DC      Y1                  SCLIN088
0041 1  0062          DC      I                   SCLIN089
0042 0  1010          SLA     16                  SCLIN090
0043 0  D01E          STO     I                   SCLIN091
0044 0  70EE          MDX     S2                  SCLIN092
0045 0  7109      EXIT MDX  1 9                   SCLIN093
0046 0  69B9          STX   1 SCLIN               SCLIN094
0047 00 65000000  XR1  LDX   L1 *-*               SCLIN095
0049 00 66000000  XR2  LDX   L2 *-*               SCLIN096
004B 00 67000000  XR3  LDX   L3 *-*               SCLIN097
004D 01 4C800000      BSC   I  SCLIN              SCLIN098
                  *                               SCLIN099
004F 0  0000      REDCT DC      0                 SCLIN100
0050 20 064C4000      LIBF    FLD                 SCLIN101
0051 0  0000      X   DC      *-*                 SCLIN102
0052 20 068A4080      LIBF    FSUB                SCLIN103
0053 0  0000      XMIN DC     *-*                 SCLIN104
0054 20 06109940      LIBF    FDIV                SCLIN105
0055 0  0000      DX  DC      *-*                 SCLIN106
0056 20 068A3580      LIBF    FSTO                SCLIN107
0057 1  0068          DC      X1                  SCLIN108
0058 20 064C4000      LIBF    FLD                 SCLIN109
0059 0  0000      Y   DC      *-*                 SCLIN110
005A 20 068A4080      LIBF    FSUB                SCLIN111
005B 0  0000      YMIN DC     *-*                 SCLIN112
005C 20 06109940      LIBF    FDIV                SCLIN113
005D 0  0000      DY  DC      *-*                 SCLIN114
005E 20 068A3580      LIBF    FSTO                SCLIN115
005F 1  006A          DC      Y1                  SCLIN116
0060 01 4C80004F      BSC   I  REDCT              SCLIN117
                  *                               SCLIN118
0062 30 174E3259  PLTIR CALL  PLTIR               SCLIN119
0064 0  0002      K2  DC      2                   SCLIN120
0065 0  0003      K3  DC      3                   SCLIN121
0066 0  0000      NX1 DC      0                   SCLIN122
0067 0  0000      NY1 DC      0                   SCLIN123
```

```
0068 00 00000000    X1      DEC     0          SCLIN124
006A 00 00000000    Y1      DEC     0          SCLIN125
0062                I       EQU     PLTIR      SCLIN126
0067                TVLOC   EQU     103        SCLIN127
006C                        END                SCLIN128

     NO ERRORS IN ABOVE ASSEMBLY.
SCLIN SCDAS
DUP FUNCTION COMPLETED
```

```
*****************************************************  SCLIF002
*  IBM 1800 SUBROUTINES FOR CALCOMP 506/570.        *  SCLIF003
*****************************************************  SCLIF004
*                                                   *  SCLIF005
*  SUBROUTINE SCLIF/SCDAF                           *  SCLIF006
*                                                   *  SCLIF007
*  CALLING SEQUENCE                                 *  SCLIF008
*  ----------------                                 *  SCLIF009
*  1.FORTRAN                                        *  SCLIF010
*     EXTERNAL CALCF                                *  SCLIF011
*     CALL SCLIF(X,Y,N,NX,NY,XMIN,DX,IFX,YMIN,DY,   *  SCLIF012
*                IFY,CALCF)                         *  SCLIF013
*     CALL SCDAF(X,Y,N,NX,NY,XMIN,DX,IFX,YMIN,DY,   *  SCLIF014
*                IFY,CALCF)                         *  SCLIF015
*  2.ASSEMBLER                                      *  SCLIF016
*     CALL     SCLIF                                *  SCLIF017
*     DC       X          MATRIX X                  *  SCLIF018
*     DC       Y          MATRIX Y                  *  SCLIF019
*     DC       N          NUMBER OF VALUES OF X,Y   *  SCLIF020
*     DC       NX         STEP FOR X-MATRIX         *  SCLIF021
*     DC       NY         STEP FOR Y-MATRIX         *  SCLIF022
*     DC       XMIN       MIN.FUNCT.VALUE OF X-AXIS*  SCLIF023
*     DC       DX         FUNCT.INCR.OF X PER 1 CM  *  SCLIF024
*     DC       IFX        0   X-VALUES STORED AS    *  SCLIF025
*                             MATRIX                *  SCLIF026
*                         NOT ZERO  X-VALUES CALC.  *  SCLIF027
*                             BY SUBR. CALCF        *  SCLIF028
*     DC       YMIN       MIN.FUNCT.VALUE OF Y-AXIS*  SCLIF029
*     DC       DY         FUNCT.INCR.OF Y PER 1 CM  *  SCLIF030
*     DC       IFY        0   Y-VALUES STORED AS    *  SCLIF031
*                             MATRIX                *  SCLIF032
*                         NOT ZERO  Y-VALUES CALC.  *  SCLIF033
*                             BY SUBR. CALCF        *  SCLIF034
*     CALL     CALCF      SUBR. FOR CALCULATION OF  *  SCLIF035
*                         X  AND/OR Y-VALUES        *  SCLIF036
*                                                   *  SCLIF037
*     CALL     SCDAF                                *  SCLIF038
*     DC       X                                    *  SCLIF039
*     .                                             *  SCLIF040
*     .                                             *  SCLIF041
*     .                                             *  SCLIF042
*     DC       IFY                                  *  SCLIF043
*     CALL     CALCF                                *  SCLIF044
*                                                   *  SCLIF045
*****************************************************  SCLIF046
0000     220D3246          ENT      SCLIF             SCLIF047
0006     220C4046          ENT      SCDAF             SCLIF048
0000 0   0000      SCLIF   DC       0                 SCLIF049
0001 0   694F              STX    1 XR1+1             SCLIF050
0002 01  65800000          LDX    I1 SCLIF            SCLIF051
0004 0   C037              LD       PLOT+1            SCLIF052
0005 0   7005              MDX      S1                SCLIF053
0006 0   0000      SCDAF   DC       0                 SCLIF054
0007 0   6949              STX    1 XR1+1             SCLIF055
0008 01  65800006          LDX    I1 SCDAF            SCLIF056
000A 0   C04E              LD       PLTIR+1           SCLIF057
000B 0   D03B      S1      STO      CALL+1            SCLIF058
000C 0   6A46              STX    2 XR2+1             SCLIF059
000D 0   6B47              STX    3 XR3+1             SCLIF060
000E 0   C100              LD     1 0                 SCLIF061
000F 0   D061              STO      X+1               SCLIF062
```

```
0010 0  C101          LD    1 1                                  SCLIF063
0011 0  D076          STO     Y+1                                SCLIF064
0012 00 C5800002      LD    I1 2                                 SCLIF065
0014 01 4C08004E      BSC   L  EXIT,+                            SCLIF066
0016 0  D001          STO     *+1                                SCLIF067
0017 00 66000000      LDX   L2 *-*          XR2=N                SCLIF068
0019 00 C5800003      LD    I1 3                                 SCLIF069
001B 0  1001          SLA     1                                  SCLIF070
001C 0  D040          STO     NX1                                SCLIF071
001D 00 C5800004      LD    I1 4                                 SCLIF072
001F 0  1001          SLA     1                                  SCLIF073
0020 0  D03D          STO     NY1                                SCLIF074
0021 0  C105          LD    1 5                                  SCLIF075
0022 0  D07B          STO     XMIN                               SCLIF076
0023 0  C106          LD    1 6                                  SCLIF077
0024 0  D07B          STO     DX                                 SCLIF078
0025 00 C5800007      LD    I1 7                                 SCLIF079
0027 0  D039          STO     IFX                                SCLIF080
0028 0  C108          LD    1 8                                  SCLIF081
0029 0  D07C          STO     YMIN                               SCLIF082
002A 0  C109          LD    1 9                                  SCLIF083
002B 0  D07C          STO     DY                                 SCLIF084
002C 00 C580000A      LD    I1 10                                SCLIF085
002E 0  D033          STO     IFY                                SCLIF086
002F 0  C10B          LD    1 11                                 SCLIF087
0030 0  D048          STO     CALC                               SCLIF088
0031 0  D05E          STO     CALC1                              SCLIF089
0032 0  C10C          LD    1 12                                 SCLIF090
0033 0  D046          STO     CALC+1                             SCLIF091
0034 0  D05C          STO     CALC1+1                            SCLIF092
0035 0  C024          LD      K1                                 SCLIF093
0036 0  D028          STO     NIX                                SCLIF094
0037 0  D028          STO     NIY                                SCLIF095
0038 00 67800067      LDX   I3 TVLOC                             SCLIF096
003A 0  4031          BSI     REDCT                              SCLIF097
003B 30 174D68C0  PLOT CALL     PLOT                             SCLIF098
003D 1  0068          DC      X1                                 SCLIF099
003E 1  006A          DC      Y1                                 SCLIF100
003F 1  005C          DC      K3                                 SCLIF101
0040 0  C01A          LD      K2                                 SCLIF102
0041 0  D016          STO     I                                  SCLIF103
0042 0  72FF      S2  MDX   2 -1                                 SCLIF104
0043 0  7001          MDX     S3                                 SCLIF105
0044 0  7009          MDX     EXIT                               SCLIF106
0045 0  4026      S3  BSI     REDCT                              SCLIF107
0046 30 174D68C0  CALL CALL     PLOT                             SCLIF108
0048 1  0068          DC      X1                                 SCLIF109
0049 1  006A          DC      Y1                                 SCLIF110
004A 1  0058          DC      I                                  SCLIF111
004B 0  1010          SLA     16                                 SCLIF112
004C 0  D00B          STO     I                                  SCLIF113
004D 0  70F4          MDX     S2                                 SCLIF114
004E 0  710D      EXIT MDX  1 13                                 SCLIF115
004F 0  69B0          STX   1 SCLIF                              SCLIF116
0050 00 65000000  XR1 LDX   L1 *-*                               SCLIF117
0052 00 66000000  XR2 LDX   L2 *-*                               SCLIF118
0054 00 67000000  XR3 LDX   L3 *-*                               SCLIF119
0056 01 4C800000      BSC   I  SCLIF                             SCLIF120
                      *                                          SCLIF121
                      *                                          SCLIF122
0058 30 174E3259  PLTIR CALL    PLTIR                            SCLIF123
```

```
005A 0  0001          K1     DC       1                    SCLIF124
005B 0  0002          K2     DC       2                    SCLIF125
005C 0  0003          K3     DC       3                    SCLIF126
005D 0  0000          NX1    DC       0                    SCLIF127
005E 0  0000          NY1    DC       0                    SCLIF128
005F 0  0000          NIX    DC       0                    SCLIF129
0060 0  0000          NIY    DC       0                    SCLIF130
0061 0  0000          IFX    DC       0                    SCLIF131
0062 0  0000          IFY    DC       0                    SCLIF132
0064 00 00000000      XO     DEC      0                    SCLIF133
0066 00 00000000      YO     DEC      0                    SCLIF134
0068 00 00000000      X1     DEC      0                    SCLIF135
006A 00 00000000      Y1     DEC      0                    SCLIF136
0058                  I      EQU      PLTIR                SCLIF137
006C 0  0000          REDCT  DC       0                    SCLIF138
006D 0  C0F3                 LD       IFX                  SCLIF139
006E 01 4C200077             BSC   L  R1,Z                 SCLIF140
0070 00 CC000000      X      LDD   L  *-*                  SCLIF141
0072 0  D8F1                 STD      XO                   SCLIF142
0073 0  C0FD                 LD       X+1                  SCLIF143
0074 0  90E8                 S        NX1                  SCLIF144
0075 0  D0FB                 STO      X+1                  SCLIF145
0076 0  700D                 MDX      R2                   SCLIF146
0077 0  6907          R1     STX   1  *+7                  SCLIF147
0078 0  6A08                 STX   2  *+8                  SCLIF148
0079 0  0000          CALC   DC       *-*                  SCLIF149
007A 0  0000                 DC       *-*                  SCLIF150
007B 1  0064                 DC       XO                   SCLIF151
007C 1  005F                 DC       NIX                  SCLIF152
007D 1  0061                 DC       IFX                  SCLIF153
007E 00 65000000             LDX   L1 *-*                  SCLIF154
0080 00 66000000             LDX   L2 *-*                  SCLIF155
0082 01 7401005F             MDX   L  NIX,1                SCLIF156
0084 0  C0DD          R2     LD       IFY                  SCLIF157
0085 01 4C20008E             BSC   L  R3,Z                 SCLIF158
0087 00 CC000000      Y      LDD   L  *-*                  SCLIF159
0089 0  D8DC                 STD      YO                   SCLIF160
008A 0  C0FD                 LD       Y+1                  SCLIF161
008B 0  90D2                 S        NY1                  SCLIF162
008C 0  D0FB                 STO      Y+1                  SCLIF163
008D 0  700D                 MDX      R4                   SCLIF164
008E 0  6907          R3     STX   1  *+7                  SCLIF165
008F 0  6A08                 STX   2  *+8                  SCLIF166
0090 0  0000          CALC1  DC       *-*                  SCLIF167
0091 0  0000                 DC       *-*                  SCLIF168
0092 1  0066                 DC       YO                   SCLIF169
0093 1  0060                 DC       NIY                  SCLIF170
0094 1  0062                 DC       IFY                  SCLIF171
0095 00 65000000             LDX   L1 *-*                  SCLIF172
0097 00 66000000             LDX   L2 *-*                  SCLIF173
0099 01 74010060             MDX   L  NIY,1                SCLIF174
009B 20 064C4000      R4     LIBF     FLD                  SCLIF175
009C 1  0064                 DC       XO                   SCLIF176
009D 20 068A4080             LIBF     FSUB                 SCLIF177
009E 0  0000          XMIN   DC       *-*                  SCLIF178
009F 20 06109940             LIBF     FDIV                 SCLIF179
00A0 0  0000          DX     DC       *-*                  SCLIF180
00A1 20 068A3580             LIBF     FSTO                 SCLIF181
00A2 1  0068                 DC       X1                   SCLIF182
00A3 20 064C4000             LIBF     FLD                  SCLIF183
00A4 1  0066                 DC       YO                   SCLIF184
```

```
00A5 20 068A4080          LIBF    FSUB                SCLIF185
00A6 0  0000      YMIN    DC      *-*                 SCLIF186
00A7 20 06109940          LIBF    FDIV                SCLIF187
00A8 0  0000      DY      DC      *-*                 SCLIF188
00A9 20 068A3580          LIBF    FSTO                SCLIF189
00AA 1  006A              DC      Y1                  SCLIF190
00AB 01 4C80006C          BSC   I REDCT               SCLIF191
                *                                     SCLIF192
0067              TVLOC   EQU     103                 SCLIF193
00AE                      END                         SCLIF194

     NO ERRORS IN ABOVE ASSEMBLY.
SCLIF SCDAF
DUP FUNCTION COMPLETED
```

```
                *****************************************************  SCMRK002
                *  IBM 1800 SUBROUTINES FOR CALCOMP 506/570.        *  SCMRK003
                *****************************************************  SCMRK004
                *                                                   *  SCMRK005
                *  SUBROUTINE SCMRK                                 *  SCMRK006
                *                                                   *  SCMRK007
                *  CALLING SEQUENCE                                 *  SCMRK008
                *  ----------------                                 *  SCMRK009
                *  1.FORTRAN                                        *  SCMRK010
                *    CALL SCMRK(X,Y,N,NX,NY,XMIN,DX,YMIN,DY,EBC)    *  SCMRK011
                *  2.ASSEMBLER                                      *  SCMRK012
                *    CALL     SCMRK                                 *  SCMRK013
                *    DC       X          MATRIX OF X-VALUES         *  SCMRK014
                *    DC       Y          MATRIX OF Y-VALUES         *  SCMRK015
                *    DC       N          NUMBER OF SYMBOLS TO BE    *  SCMRK016
                *                        DESIGNED                   *  SCMRK017
                *    DC       NX         STEP FOR X-MATRIX          *  SCMRK018
                *    DC       NY         STEP FOR Y-MATRIX          *  SCMRK019
                *    DC       XMIN       MIN.VALUE FOR GRADUATION   *  SCMRK020
                *                        OF X-AXIS                  *  SCMRK021
                *    DC       DX         FUNCT.INCR.AT 1 CM X-AXIS  *  SCMRK022
                *    DC       YMIN       MIN. VALUE FOR GRADUATION  *  SCMRK023
                *                        OF Y-AXIS                  *  SCMRK024
                *    DC       DY         FUNCT.INCR.AT 1 CM Y-AXIS  *  SCMRK025
                *    DC       EBC        SYMBOL TO BE DESIGNED      *  SCMRK026
                *                        (LEFT HAND SIDE ADJUSTED)  *  SCMRK027
                *****************************************************  SCMRK028
0000     220D4652           ENT      SCMRK                             SCMRK029
0000 0   0000       SCMRK   DC       0                                 SCMRK030
0001 0   6946               STX    1 XR1+1                             SCMRK031
0002 0   6A47               STX    2 XR2+1                             SCMRK032
0003 0   6B48               STX    3 XR3+1                             SCMRK033
0004 01  65800000           LDX   I1 SCMRK                             SCMRK034
0006 00  67800067           LDX   I3 TVLOC                             SCMRK035
0008 0   C100               LD     1 0                                 SCMRK036
0009 0   D01C               STO      X                                 SCMRK037
000A 0   C101               LD     1 1                                 SCMRK038
000B 0   D022               STO      Y                                 SCMRK039
000C 00  C5800002           LD    I1 2                                 SCMRK040
000E 01  4C080045           BSC   L  EXIT,+                            SCMRK041
0010 0   D001               STO      *+1                               SCMRK042
0011 00  66000000           LDX   L2 *-*                               SCMRK043
0013 00  C5800003           LD    I1 3                                 SCMRK044
0015 0   1001               SLA      1                                 SCMRK045
0016 0   D042               STO      NX1                               SCMRK046
0017 00  C5800004           LD    I1 4                                 SCMRK047
0019 0   1001               SLA      1                                 SCMRK048
001A 0   D03F               STO      NY1                               SCMRK049
001B 0   C105               LD     1 5                                 SCMRK050
001C 0   D00B               STO      XMIN                              SCMRK051
001D 0   C106               LD     1 6                                 SCMRK052
001E 0   D00B               STO      DX                                SCMRK053
001F 0   C107               LD     1 7                                 SCMRK054
0020 0   D00F               STO      YMIN                              SCMRK055
0021 0   C108               LD     1 8                                 SCMRK056
0022 0   D00F               STO      DY                                SCMRK057
0023 0   C109               LD     1 9                                 SCMRK058
0024 0   D016               STO      EBC                               SCMRK059
0025 20  064C4000   S1      LIBF     FLD                               SCMRK060
0026 0   0000       X       DC       *-*                               SCMRK061
0027 20  068A4080           LIBF     FSUB                              SCMRK062
```

```
0028 0  0000          XMIN   DC       *-*                SCMRK063
0029 20 06109940             LIBF     FDIV               SCMRK064
002A 0  0000          DX     DC       *-*                SCMRK065
002B 20 068A3580             LIBF     FSTO               SCMRK066
002C 1  0050                 DC       X1                 SCMRK067
002D 20 064C4000             LIBF     FLD                SCMRK068
002E 0  0000          Y      DC       *-*                SCMRK069
002F 20 068A4080             LIBF     FSUB               SCMRK070
0030 0  0000          YMIN   DC       *-*                SCMRK071
0031 20 06109940             LIBF     FDIV               SCMRK072
0032 0  0000          DY     DC       *-*                SCMRK073
0033 20 068A3580             LIBF     FSTO               SCMRK074
0034 1  0052                 DC       Y1                 SCMRK075
0035 30 22A14093             CALL     SYMBL              SCMRK076
0037 1  0050                 DC       X1                 SCMRK077
0038 1  0052                 DC       Y1                 SCMRK078
0039 1  0054                 DC       DP3                SCMRK079
003A 1  0056                 DC       D0                 SCMRK080
003B 0  0000          EBC    DC       *-*                SCMRK081
003C 1  0058                 DC       K1                 SCMRK082
003D 0  C0E8                 LD       X                  SCMRK083
003E 0  901A                 S        NX1                SCMRK084
003F 0  D0E6                 STO      X                  SCMRK085
0040 0  C0ED                 LD       Y                  SCMRK086
0041 0  9018                 S        NY1                SCMRK087
0042 0  D0EB                 STO      Y                  SCMRK088
0043 0  72FF                 MDX    2 -1                 SCMRK089
0044 0  70E0                 MDX      S1                 SCMRK090
0045 01 740A0000      EXIT   MDX   L   SCMRK,10          SCMRK091
0047 00 65000000      XR1    LDX   L1  *-*                SCMRK092
0049 00 66000000      XR2    LDX   L2  *-*                SCMRK093
004B 00 67000000      XR3    LDX   L3  *-*                SCMRK094
004D 01 4C800000             BSC   I   SCMRK            SCMRK095
0050 00 00000000      X1     DEC       0                SCMRK096
0052 00 00000000      Y1     DEC       0                SCMRK097
0054 00 4CCCCC7F      DP3    DEC       0.3              SCMRK098
0056 00 00000000      D0     DEC       0                SCMRK099
0058 0  0001          K1     DC        1                SCMRK100
0059 0  0000          NX1    DC        0                SCMRK101
005A 0  0000          NY1    DC        0                SCMRK102
0067                  TVLOC  EQU       103              SCMRK103
005C                         END                        SCMRK104

     NO ERRORS IN ABOVE ASSEMBLY.
SCMRK
DUP FUNCTION COMPLETED
```

```
*********************************************************  SCMRF002
*  IBM 1800 SUBROUTINES FOR CALCOMP 506/570.            *  SCMRF003
*********************************************************  SCMRF004
*                                                       *  SCMRF005
*  SUBROUTINE SCMRF                                     *  SCMRF006
*                                                       *  SCMRF007
*  CALLING SEQUENCE                                     *  SCMRF008
*  ----------------                                     *  SCMRF009
*  1.FORTRAN                                            *  SCMRF010
*     EXTERNAL CALCF                                    *  SCMRF011
*     CALL SCMRF(X,Y,N,NX,NY,XMIN,DX,IFX,YMIN,DY,       *  SCMRF012
*                IFY,CALCF,EBC)                         *  SCMRF013
*  2.ASSEMBLER                                          *  SCMRF014
*     CALL     SCMRF                                    *  SCMRF015
*     DC       X          MATRIX OF X-VALUES            *  SCMRF016
*     DC       Y          MATRIX OF Y-VALUES            *  SCMRF017
*     DC       N          NUMBER OF SYMBOLS TO BE       *  SCMRF018
*                         DESIGNED                      *  SCMRF019
*     DC       NX         STEP FOR X-MATRIX             *  SCMRF020
*     DC       NY         STEP FOR Y-MATRIX             *  SCMRF021
*     DC       XMIN       MIN.VALUE FOR GRADUATION      *  SCMRF022
*                         OF X-AXIS                     *  SCMRF023
*     DC       DX         FUNCT.INCR.AT 1 CM X-AXIS     *  SCMRF024
*     DC       IFX        0   X-VALUES STORED AS        *  SCMRF025
*                            MATRIX                     *  SCMRF026
*                         NOT ZERO  X-VALUES CALC.      *  SCMRF027
*                            BY SUBR. CALCF             *  SCMRF028
*     DC       YMIN       MIN. VALUE FOR GRADUATION     *  SCMRF029
*                         OF Y-AXIS                     *  SCMRF030
*     DC       DY         FUNCT.INCR.AT 1 CM Y-AXIS     *  SCMRF031
*     DC       IFY        0   Y-VALUES STORED AS        *  SCMRF032
*                            MATRIX                     *  SCMRF033
*                         NOT ZERO  Y-VALUES CALC.      *  SCMRF034
*                            BY SUBR. CALCF             *  SCMRF035
*     CALL     CALCF      SUBR. FOR CALCULATION OF      *  SCMRF036
*                         X  AND/OR Y-VALUES            *  SCMRF037
*     DC       EBC        SYMBOL TO BE DESIGNED         *  SCMRF038
*                         (LEFT HAND SIDE ADJUSTED)     *  SCMRF039
*********************************************************  SCMRF040
0000     220D4646      ENT      SCMRF                        SCMRF041
0000 0   0000    SCMRF DC       0                            SCMRF042
0001 0   697D          STX    1 XR1+1                        SCMRF043
0002 0   6A7E          STX    2 XR2+1                        SCMRF044
0003 0   6B7F          STX    3 XR3+1                        SCMRF045
0004 01  65800000      LDX   I1 SCMRF                        SCMRF046
0006 00  67800067      LDX   I3 TVLOC                        SCMRF047
0008 0   C100          LD     1 0                            SCMRF048
0009 0   D02E          STO      X+1                          SCMRF049
000A 0   C101          LD     1 1                            SCMRF050
000B 0   D043          STO      Y+1                          SCMRF051
000C 00  C5800002      LD    I1 2                            SCMRF052
000E 01  4C08007C      BSC   L  EXIT,+                       SCMRF053
0010 0   D001          STO      *+1                          SCMRF054
0011 00  66000000      LDX   L2 *-*                          SCMRF055
0013 00  C5800003      LD    I1 3                            SCMRF056
0015 0   1001          SLA      1                            SCMRF057
0016 0   D074          STO      NX1                          SCMRF058
0017 00  C5800004      LD    I1 4                            SCMRF059
0019 0   1001          SLA      1                            SCMRF060
001A 0   D071          STO      NY1                          SCMRF061
001B 0   C105          LD     1 5                            SCMRF062
```

```
001C  0  D048              STO      XMIN          SCMRF063
001D  0  C106              LD     1 6             SCMRF064
001E  0  D048              STO      DX            SCMRF065
001F  00 C5800007          LD     I1 7            SCMRF066
0021  0  D066              STO      IFX           SCMRF067
0022  0  C108              LD     1 8             SCMRF068
0023  0  D049              STO      YMIN          SCMRF069
0024  0  C109              LD     1 9             SCMRF070
0025  0  D049              STO      DY            SCMRF071
0026  00 C580000A          LD     I1 10           SCMRF072
0028  0  D060              STO      IFY           SCMRF073
0029  0  C10B              LD     1 11            SCMRF074
002A  0  D015              STO      CALC          SCMRF075
002B  0  D02B              STO      CALC1         SCMRF076
002C  0  C10C              LD     1 12            SCMRF077
002D  0  D013              STO      CALC+1        SCMRF078
002E  0  D029              STO      CALC1+1       SCMRF079
002F  0  C10D              LD     1 13            SCMRF080
0030  0  D047              STO      EBC           SCMRF081
0031  0  C058              LD       K1            SCMRF082
0032  0  D053              STO      NIX           SCMRF083
0033  0  D053              STO      NIY           SCMRF084
0034  0  C053        S1    LD       IFX           SCMRF085
0035  01 4C20003E          BSC    L S2,Z          SCMRF086
0037  00 CC000000    X     LDD    L *-*           SCMRF087
0039  0  D854              STD      XO            SCMRF088
003A  0  C0FD              LD       X+1           SCMRF089
003B  0  904F              S        NX1           SCMRF090
003C  0  D0FB              STO      X+1           SCMRF091
003D  0  700D              MDX      S3            SCMRF092
003E  0  6907        S2    STX    1 *+7           SCMRF093
003F  0  6A08              STX    2 *+8           SCMRF094
0040  0  0000        CALC  DC       *-*           SCMRF095
0041  0  0000              DC       *-*           SCMRF096
0042  1  008E              DC       XO            SCMRF097
0043  1  0086              DC       NIX           SCMRF098
0044  1  0088              DC       IFX           SCMRF099
0045  00 65000000          LDX    L1 *-*          SCMRF100
0047  00 66000000          LDX    L2 *-*          SCMRF101
0049  01 74010086          MDX    L  NIX,1        SCMRF102
004B  0  C03D        S3    LD       IFY           SCMRF103
004C  01 4C200055          BSC    L  S4,Z         SCMRF104
004E  00 CC000000    Y     LDD    L  *-*          SCMRF105
0050  0  D83F              STD      YO            SCMRF106
0051  0  C0FD              LD       Y+1           SCMRF107
0052  0  9039              S        NY1           SCMRF108
0053  0  D0FB              STO      Y+1           SCMRF109
0054  0  700D              MDX      S5            SCMRF110
0055  0  6907        S4    STX    1 *+7           SCMRF111
0056  0  6A08              STX    2 *+8           SCMRF112
0057  0  0000        CALC1 DC       *-*           SCMRF113
0058  0  0000              DC       *-*           SCMRF114
0059  1  0090              DC       YO            SCMRF115
005A  1  0087              DC       NIY           SCMRF116
005B  1  0089              DC       IFY           SCMRF117
005C  00 65000000          LDX    L1 *-*          SCMRF118
005E  00 66000000          LDX    L2 *-*          SCMRF119
0060  01 74010087          MDX    L  NIY,1        SCMRF120
0062  20 064C4000    S5    LIBF     FLD           SCMRF121
0063  1  008E              DC       XO            SCMRF122
0064  20 068A4080          LIBF     FSUB          SCMRF123
```

```
0065 0  0000          XMIN   DC       *-*                  SCMRF124
0066 20 06109940             LIBF     FDIV                 SCMRF125
0067 0  0000          DX     DC       *-*                  SCMRF126
0068 20 068A3580             LIBF     FSTO                 SCMRF127
0069 1  0092                 DC       X1                   SCMRF128
006A 20 064C4000             LIBF     FLD                  SCMRF129
006B 1  0090                 DC       Y0                   SCMRF130
006C 20 068A4080             LIBF     FSUB                 SCMRF131
006D 0  0000          YMIN   DC       *-*                  SCMRF132
006E 20 06109940             LIBF     FDIV                 SCMRF133
006F 0  0000          DY     DC       *-*                  SCMRF134
0070 20 068A3580             LIBF     FSTO                 SCMRF135
0071 1  0094                 DC       Y1                   SCMRF136
0072 30 22A14093             CALL     SYMBL                SCMRF137
0074 1  0092                 DC       X1                   SCMRF138
0075 1  0094                 DC       Y1                   SCMRF139
0076 1  0096                 DC       DP3                  SCMRF140
0077 1  0098                 DC       D0                   SCMRF141
0078 0  0000          EBC    DC       *-*                  SCMRF142
0079 1  008A                 DC       K1                   SCMRF143
007A 0  72FF                 MDX    2 -1                   SCMRF144
007B 0  70B8                 MDX      S1                   SCMRF145
007C 01 740E0000      EXIT   MDX   L  SCMRF,14             SCMRF146
007E 00 65000000      XR1    LDX   L1 *-*                  SCMRF147
0080 00 66000000      XR2    LDX   L2 *-*                  SCMRF148
0082 00 67000000      XR3    LDX   L3 *-*                  SCMRF149
0084 01 4C800000             BSC   I  SCMRF                SCMRF150
                      *                                    SCMRF151
0086 0  0000          NIX    DC       0                    SCMRF152
0087 0  0000          NIY    DC       0                    SCMRF153
0088 0  0000          IFX    DC       0                    SCMRF154
0089 0  0000          IFY    DC       0                    SCMRF155
008A 0  0001          K1     DC       1                    SCMRF156
008B 0  0000          NX1    DC       0                    SCMRF157
008C 0  0000          NY1    DC       0                    SCMRF158
008E 00 00000000      X0     DEC      0                    SCMRF159
0090 00 00000000      Y0     DEC      0                    SCMRF160
0092 00 00000000      X1     DEC      0                    SCMRF161
0094 00 00000000      Y1     DEC      0                    SCMRF162
0096 00 4CCCCC7F      DP3    DEC      0.3                  SCMRF163
0098 00 00000000      D0     DEC      0                    SCMRF164
0067                  TVLOC  EQU      103                  SCMRF165
009A                         END                           SCMRF166
```

NO ERRORS IN ABOVE ASSEMBLY.

SCMRF
DUP FUNCTION COMPLETED

```
*****************************************************  SCLLG002
*  IBM 1800 SUBROUTINES FOR CALCOMP 506/570.        *  SCLLG003
*****************************************************  SCLLG004
*                                                   *  SCLLG005
*  SUBROUTINE SCLLG/SCDLG                           *  SCLLG006
*                                                   *  SCLLG007
*  CALLING SEQUENCE                                 *  SCLLG008
*  ----------------                                 *  SCLLG009
*  1.FORTRAN                                        *  SCLLG010
*     CALL SCLLG(X,Y,N,NX,NY,XMINL,DX,YMINL,DY)     *  SCLLG011
*     CALL SCDLG(X,Y,N,NX,NY,XMINL,DX,YMINL,DY)     *  SCLLG012
*  2.ASSEMBLER                                      *  SCLLG013
*     CALL     SCLLG                                *  SCLLG014
*     DC       X          MATRIX X                  *  SCLLG015
*     DC       Y          MATRIX Y                  *  SCLLG016
*     DC       N          NUMBER OF VALUES          *  SCLLG017
*     DC       NX         STEP FOR X-MATRIX         *  SCLLG018
*     DC       NY         STEP FOR Y-MATRIX         *  SCLLG019
*     DC       XMINL      MIN. LOG. VALUE FOR GRAD.*  SCLLG020
*                         OF X-AXIS                 *  SCLLG021
*     DC       DX         FUNCT.LOG.INCR. FOR 1 CM  *  SCLLG022
*     DC       YMINL      MIN. LOG. VALUE FOR GRAD.*  SCLLG023
*                         OF Y-AXIS                 *  SCLLG024
*     DC       DY         FUNCT.LOG.INCR. FOR 1 CM  *  SCLLG025
*     CALL     SCDLG                                *  SCLLG026
*     DC       X                                    *  SCLLG027
*        .                                          *  SCLLG028
*        .                                          *  SCLLG029
*        .                                          *  SCLLG030
*     DC       DY                                   *  SCLLG031
*****************************************************  SCLLG032
0000     220D34C7          ENT     SCLLG              SCLLG033
0006     220C44C7          ENT     SCDLG              SCLLG034
0000 0   0000      SCLLG DC      0                    SCLLG035
0001 0   6946            STX   1 XR1+1                SCLLG036
0002 01  65800000        LDX   I1 SCLLG               SCLLG037
0004 0   C02A            LD      PLOT+1               SCLLG038
0005 0   7005            MDX     S1                   SCLLG039
0006 0   0000      SCDLG DC      0                    SCLLG040
0007 0   6940            STX   1 XR1+1                SCLLG041
0008 01  65800006        LDX   I1 SCDLG               SCLLG042
000A 0   C068            LD      PLTIR+1              SCLLG043
000B 0   D032      S1    STO     CALL+1               SCLLG044
000C 0   6A3D            STX   2 XR2+1                SCLLG045
000D 0   6B3E            STX   3 XR3+1                SCLLG046
000E 00  67800067        LDX   I3 TVLOC               SCLLG047
0010 0   C100            LD    1 0                    SCLLG048
0011 0   D03F            STO     X                    SCLLG049
0012 0   C101            LD    1 1                    SCLLG050
0013 0   D04B            STO     Y                    SCLLG051
0014 00  C5800002        LD    I1 2                   SCLLG052
0016 01  4C080045        BSC   L  EXIT,+              SCLLG053
0018 0   D001            STO     *+1                  SCLLG054
0019 00  66000000        LDX   L2 *-*                 SCLLG055
001B 00  C5800003        LD    I1 3                   SCLLG056
001D 0   1001            SLA     1                    SCLLG057
001E 0   D059            STO     NX1                  SCLLG058
001F 00  C5800004        LD    I1 4                   SCLLG059
0021 0   1001            SLA     1                    SCLLG060
0022 0   D056            STO     NY1                  SCLLG061
0023 0   C105            LD    1 5                    SCLLG062
```

```
0024 0  D034              STO     XMINL     SCLLG063
0025 0  C106              LD    1 6         SCLLG064
0026 0  D034              STO     DX        SCLLG065
0027 0  C107              LD    1 7         SCLLG066
0028 0  D03E              STO     YMINL     SCLLG067
0029 0  C108              LD    1 8         SCLLG068
002A 0  D03E              STO     DY        SCLLG069
002B 0  C04E              LD      K2        SCLLG070
002C 0  D045              STO     I         SCLLG071
002D 0  4021              BSI     REDCT     SCLLG072
002E 30 174D68C0    PLOT  CALL    PLOT      SCLLG073
0030 1  006E              DC      X1        SCLLG074
0031 1  0070              DC      Y1        SCLLG075
0032 1  007B              DC      K3        SCLLG076
                    *                       SCLLG077
0033 0  72FF        S2    MDX   2 -1        SCLLG078
0034 0  7001              MDX     S3        SCLLG079
0035 0  700F              MDX     EXIT      SCLLG080
0036 0  C01A        S3    LD      X         SCLLG081
0037 0  9040              S       NX1       SCLLG082
0038 0  D018              STO     X         SCLLG083
0039 0  C025              LD      Y         SCLLG084
003A 0  903E              S       NY1       SCLLG085
003B 0  D023              STO     Y         SCLLG086
003C 0  4012              BSI     REDCT     SCLLG087
003D 30 174D68C0    CALL  CALL    PLOT      SCLLG088
003F 1  006E              DC      X1        SCLLG089
0040 1  0070              DC      Y1        SCLLG090
0041 1  0072              DC      I         SCLLG091
0042 0  1010              SLA     16        SCLLG092
0043 0  D02E              STO     I         SCLLG093
0044 0  70EE              MDX     S2        SCLLG094
0045 0  7109        EXIT  MDX   1 9         SCLLG095
0046 0  69B9              STX   1 SCLLG     SCLLG096
0047 00 65000000    XR1   LDX   L1 *-*      SCLLG097
0049 00 66000000    XR2   LDX   L2 *-*      SCLLG098
004B 00 67000000    XR3   LDX   L3 *-*      SCLLG099
004D 01 4C800000          BSC   I SCLLG     SCLLG100
                    *                       SCLLG101
004F 0  0000        REDCT DC      0         SCLLG102
0050 20 064C4000          LIBF    FLD       SCLLG103
0051 0  0000        X     DC      *-*       SCLLG104
0052 20 06044100          LIBF    FADD      SCLLG105
0053 1  0076              DC      DMN       SCLLG106
0054 30 064D5000          CALL    FLN       SCLLG107
0056 20 06517A00          LIBF    FMPY      SCLLG108
0057 1  0074              DC      CON       SCLLG109
0058 20 068A4080          LIBF    FSUB      SCLLG110
0059 0  0000        XMINL DC      *-*       SCLLG111
005A 20 06109940          LIBF    FDIV      SCLLG112
005B 0  0000        DX    DC      *-*       SCLLG113
005C 20 068A3580          LIBF    FSTO      SCLLG114
005D 1  006E              DC      X1        SCLLG115
005E 20 064C4000          LIBF    FLD       SCLLG116
005F 0  0000        Y     DC      *-*       SCLLG117
0060 20 06044100          LIBF    FADD      SCLLG118
0061 1  0076              DC      DMN       SCLLG119
0062 30 064D5000          CALL    FLN       SCLLG120
0064 20 06517A00          LIBF    FMPY      SCLLG121
0065 1  0074              DC      CON       SCLLG122
0066 20 068A4080          LIBF    FSUB      SCLLG123
```

```
0067 0  0000          YMINL  DC        *-*                SCLLG124
0068 20 06109940             LIBF      FDIV               SCLLG125
0069 0  0000          DY     DC        *-*                SCLLG126
006A 20 068A3580             LIBF      FSTO               SCLLG127
006B 1  0070                 DC        Y1                 SCLLG128
006C 01 4C80004F             BSC   I   REDCT             SCLLG129
                      *                                  SCLLG130
006E 00 00000000      X1     DEC       0                  SCLLG131
0070 00 00000000      Y1     DEC       0                  SCLLG132
0072 30 174E3259      PLTIR  CALL      PLTIR              SCLLG133
0072                  I      EQU       PLTIR              SCLLG134
0074 00 6F2DEC7F      CON    DEC       0.4342945          SCLLG135
0076 0  4000          DMN    DC        /4000              SCLLG136
0077 0  0000                 DC        0                  SCLLG137
0078 0  0000          NX1    DC        0                  SCLLG138
0079 0  0000          NY1    DC        0                  SCLLG139
007A 0  0002          K2     DC        2                  SCLLG140
007B 0  0003          K3     DC        3                  SCLLG141
0067                  TVLOC  EQU       103                SCLLG142
007C                         END                          SCLLG143
```

NO ERRORS IN ABOVE ASSEMBLY.
SCLLG SCDLG
DUP FUNCTION COMPLETED

```
*****************************************************  SCMLG002
*  IBM 1800 SUBROUTINES FOR CALCOMP 506/570.        *  SCMLG003
*****************************************************  SCMLG004
*                                                   *  SCMLG005
*  SUBROUTINE SCMLG                                 *  SCMLG006
*                                                   *  SCMLG007
*  CALLING SEQUENCE                                 *  SCMLG008
*  ----------------                                 *  SCMLG009
*  1.FORTRAN                                        *  SCMLG010
*     CALL SCMLG(X,Y,N,NX,NY,XMINL,DX,YMINL,DY,     *  SCMLG011
*                EBC)                               *  SCMLG012
*  2.ASSEMBLER                                      *  SCMLG013
*     CALL    SCMLG                                 *  SCMLG014
*     DC      X          MATRIX OF X-VALUES         *  SCMLG015
*     DC      Y          MATRIX OF Y-VALUES         *  SCMLG016
*     DC      N          NUMBER OF SYMBOLS TO BE    *  SCMLG017
*                        DESIGNED                   *  SCMLG018
*     DC      NX         STEP FOR X-MATRIX          *  SCMLG019
*     DC      NY         STEP FOR Y-MATRIX          *  SCMLG020
*     DC      XMINL      MIN.LOG.VALUE FOR GRAD.    *  SCMLG021
*                        OF X-AXIS                  *  SCMLG022
*     DC      DX         FUNCT.INCR.AT 1 CM X-AXIS  *  SCMLG023
*     DC      YMINL      MIN.LOG.VALUE FOR GRAD.    *  SCMLG024
*                        OF Y-AXIS                  *  SCMLG025
*     DC      DY         FUNCT.INCR.AT 1 CM Y-AXIS  *  SCMLG026
*     DC      EBC        SYMBOL TO BE DESIGNED      *  SCMLG027
*                        (LEFT HAND SIDE ADJUSTED)  *  SCMLG028
*****************************************************  SCMLG029
```

```
0000     220D44C7          ENT     SCMLG                          SCMLG030
0000 0   0000      SCMLG   DC      0                              SCMLG031
0001 0   6952              STX   1 XR1+1                          SCMLG032
0002 0   6A53              STX   2 XR2+1                          SCMLG033
0003 0   6B54              STX   3 XR3+1                          SCMLG034
0004 01  65800000          LDX   I1 SCMLG                         SCMLG035
0006 00  67800067          LDX   I3 TVLOC                         SCMLG036
0008 0   C100              LD    1 0                              SCMLG037
0009 0   D01C              STO     X                              SCMLG038
000A 0   C101              LD    1 1                              SCMLG039
000B 0   D028              STO     Y                              SCMLG040
000C 00  C5800002          LD    I1 2                             SCMLG041
000E 01  4C080051          BSC   L  EXIT,+                        SCMLG042
0010 0   D001              STO     *+1                            SCMLG043
0011 00  66000000          LDX   L2 *-*                           SCMLG044
0013 00  C5800003          LD    I1 3                             SCMLG045
0015 0   1001              SLA     1                              SCMLG046
0016 0   D052              STO     NX1                            SCMLG047
0017 00  C5800004          LD    I1 4                             SCMLG048
0019 0   1001              SLA     1                              SCMLG049
001A 0   D04F              STO     NY1                            SCMLG050
001B 0   C105              LD    1 5                              SCMLG051
001C 0   D011              STO     XMINL                          SCMLG052
001D 0   C106              LD    1 6                              SCMLG053
001E 0   D011              STO     DX                             SCMLG054
001F 0   C107              LD    1 7                              SCMLG055
0020 0   D01B              STO     YMINL                          SCMLG056
0021 0   C108              LD    1 8                              SCMLG057
0022 0   D01B              STO     DY                             SCMLG058
0023 0   C109              LD    1 9                              SCMLG059
0024 0   D022              STO     EBC                            SCMLG060
0025 20  064C4000    S1    LIBF    FLD                            SCMLG061
0026 0   0000        X     DC      *-*                            SCMLG062
```

```
0027 20 06044100          LIBF    FADD                    SCMLG063
0028 1  0064              DC      DMN                     SCMLG064
0029 30 064D5000          CALL    FLN                     SCMLG065
002B 20 06517A00          LIBF    FMPY                    SCMLG066
002C 1  0066              DC      CON                     SCMLG067
002D 20 068A4080          LIBF    FSUB                    SCMLG068
002E 0  0000      XMINL   DC      *-*                     SCMLG069
002F 20 06109940          LIBF    FDIV                    SCMLG070
0030 0  0000      DX      DC      *-*                     SCMLG071
0031 20 068A3580          LIBF    FSTO                    SCMLG072
0032 1  005C              DC      X1                      SCMLG073
0033 20 064C4000          LIBF    FLD                     SCMLG074
0034 0  0000      Y       DC      *-*                     SCMLG075
0035 20 06044100          LIBF    FADD                    SCMLG076
0036 1  0064              DC      DMN                     SCMLG077
0037 30 064D5000          CALL    FLN                     SCMLG078
0039 20 06517A00          LIBF    FMPY                    SCMLG079
003A 1  0066              DC      CON                     SCMLG080
003B 20 068A4080          LIBF    FSUB                    SCMLG081
003C 0  0000      YMINL   DC      *-*                     SCMLG082
003D 20 06109940          LIBF    FDIV                    SCMLG083
003E 0  0000      DY      DC      *-*                     SCMLG084
003F 20 068A3580          LIBF    FSTO                    SCMLG085
0040 1  005E              DC      Y1                      SCMLG086
0041 30 22A14093          CALL    SYMBL                   SCMLG087
0043 1  005C              DC      X1                      SCMLG088
0044 1  005E              DC      Y1                      SCMLG089
0045 1  0062              DC      DP3                     SCMLG090
0046 1  0060              DC      D0                      SCMLG091
0047 0  0000      EBC     DC      *-*                     SCMLG092
0048 1  0068              DC      K1                      SCMLG093
0049 0  C0DC              LD      X                       SCMLG094
004A 0  901E              S       NX1                     SCMLG095
004B 0  D0DA              STO     X                       SCMLG096
004C 0  C0E7              LD      Y                       SCMLG097
004D 0  901C              S       NY1                     SCMLG098
004E 0  D0E5              STO     Y                       SCMLG099
004F 0  72FF              MDX   2 -1                      SCMLG100
0050 0  70D4              MDX     S1                      SCMLG101
0051 01 740A0000  EXIT    MDX   L SCMLG,10                SCMLG102
0053 00 65000000  XR1     LDX   L1 *-*                    SCMLG103
0055 00 66000000  XR2     LDX   L2 *-*                    SCMLG104
0057 00 67000000  XR3     LDX   L3 *-*                    SCMLG105
0059 01 4C800000          BSC   I  SCMLG                  SCMLG106
                  *                                       SCMLG107
005C 00 00000000  X1      DEC     0                       SCMLG108
005E 00 00000000  Y1      DEC     0                       SCMLG109
0060 00 00000000  D0      DEC     0                       SCMLG110
0062 00 4CCCCC7F  DP3     DEC     0.3                     SCMLG111
0064 0  4000      DMN     DC      /4000                   SCMLG112
0065 0  0000              DC      0                       SCMLG113
0066 00 6F2DEC7F  CON     DEC     0.4342945               SCMLG114
0068 0  0001      K1      DC      1                       SCMLG115
0069 0  0000      NX1     DC      0                       SCMLG116
006A 0  0000      NY1     DC      0                       SCMLG117
0067              TVLOC   EQU     103                     SCMLG118
006C                      END                             SCMLG119
```

NO ERRORS IN ABOVE ASSEMBLY.

SCMLG
DUP FUNCTION COMPLETED

```
*****************************************************  LINSC002
*   IBM 1800 SUBROUTINES FOR CALCOMP 506/570.       *  LINSC003
*****************************************************  LINSC004
*                                                   *  LINSC005
*   SUBROUTINE LINSC/DASSC                          *  LINSC006
*                                                   *  LINSC007
*   CALLING SEQUENCE                                *  LINSC008
*   ----------------                                *  LINSC009
*   1.FORTRAN                                       *  LINSC010
*      CALL LINSC(X,Y,N,NX,NY,IX,XMIN,DX,IY,YMIN,   *  LINSC011
*                 DY)                               *  LINSC012
*      CALL DASSC(X,Y,N,NX,NY,IX,XMIN,DX,IY,YMIN,   *  LINSC013
*                 DY)                               *  LINSC014
*   2.ASSEMBLER                                     *  LINSC015
*      CALL    LINSC                                *  LINSC016
*      DC      X          MATRIX OF X-COORDINATES   *  LINSC017
*      DC      Y          MATRIX OF Y-COORDINATES   *  LINSC018
*      DC      N          NUMBER OF VALUES          *  LINSC019
*      DC      NX         STEP FOR X-MATRIX         *  LINSC020
*      DC      NY         STEP FOR Y-MATRIX         *  LINSC021
*      DC      IX         INDICATOR FOR LIN. OR     *  LINSC022
*                         LOG. SCALE FOR X-AXIS     *  LINSC023
*      DC      XMIN       MIN. VALUE (OR LOG.) FOR  *  LINSC024
*                         THE GRADUATION OF X-AXIS  *  LINSC025
*      DC      DX         FUNCT. INCR. FOR 1CM      *  LINSC026
*      DC      IY         INDICATOR FOR Y-AXIS      *  LINSC027
*      DC      YMIN       MIN.VALUE FOR Y-AXIS      *  LINSC028
*      DC      DY         FUNCT.INCR. OF 1CM ON     *  LINSC029
*                         Y-AXIS                    *  LINSC030
*      CALL    DASSC                                *  LINSC031
*      DC      X                                    *  LINSC032
*      .                                            *  LINSC033
*      .                                            *  LINSC034
*      .                                            *  LINSC035
*      DC      DY                                   *  LINSC036
*****************************************************  LINSC037
0000     13255883          ENT     LINSC              LINSC038
0006     04062883          ENT     DASSC              LINSC039
0000 0   0000      LINSC   DC      0                  LINSC040
0001 0   6946              STX   1 XR1+1              LINSC041
0002 01  65800000          LDX   I1 LINSC             LINSC042
0004 0   C028              LD      PLOT+1             LINSC043
0005 0   7005              MDX     L1                 LINSC044
0006 0   0000      DASSC   DC      0                  LINSC045
0007 0   6940              STX   1 XR1+1              LINSC046
0008 01  65800006          LDX   I1 DASSC             LINSC047
000A 0   C06C              LD      PLTIR+1            LINSC048
000B 0   D032      L1      STO     CALL+1             LINSC049
000C 0   6A3D              STX   2 XR2+1              LINSC050
000D 0   6B3E              STX   3 XR3+1              LINSC051
000E 00  67800067          LDX   I3 TVLOC             LINSC052
0010 0   C100              LD    1 0                  LINSC053
0011 0   D03F              STO     X                  LINSC054
0012 0   C101              LD    1 1                  LINSC055
0013 0   D04F              STO     Y                  LINSC056
0014 00  C5800002          LD    I1 2                 LINSC057
0016 01  4C080045          BSC   L  EXIT,+            LINSC058
0018 0   D001              STO     *+1                LINSC059
0019 00  66000000          LDX   L2 *-*       XR2 HAS N LINSC060
001B 00  C5800003          LD    I1 3                 LINSC061
001D 0   1001              SLA     1                  LINSC062
```

```
001E  0   D05B              STO      NX1                 LINSC063
001F  00  C5800004          LD    I1 4                   LINSC064
0021  0   1001              SLA      1                   LINSC065
0022  0   D058              STO      NY1                 LINSC066
0023  0   C106              LD    1  6                   LINSC067
0024  0   D038              STO      XMIN                LINSC068
0025  0   C107              LD    1  7                   LINSC069
0026  0   D038              STO      DX                  LINSC070
0027  0   C109              LD    1  9                   LINSC071
0028  0   D046              STO      YMIN                LINSC072
0029  0   C10A              LD    1  10                  LINSC073
002A  0   D046              STO      DY                  LINSC074
002B  0   4023              BSI      REDCT               LINSC075
002C  30  174D68C0    PLOT  CALL     PLOT                LINSC076
002E  1   007C              DC       X1                  LINSC077
002F  1   007E              DC       Y1                  LINSC078
0030  1   0079              DC       K3                  LINSC079
0031  0   C046              LD       K2                  LINSC080
0032  0   D043              STO      I                   LINSC081
0033  0   72FF        L2    MDX    2 -1                  LINSC082
0034  0   7001              MDX      L3                  LINSC083
0035  0   700F              MDX      EXIT                LINSC084
0036  0   C01A        L3    LD       X                   LINSC085
0037  0   9042              S        NX1                 LINSC086
0038  0   D018              STO      X                   LINSC087
0039  0   C029              LD       Y                   LINSC088
003A  0   9040              S        NY1                 LINSC089
003B  0   D027              STO      Y                   LINSC090
003C  0   4012              BSI      REDCT               LINSC091
003D  30  174D68C0    CALL  CALL     PLOT                LINSC092
003F  1   007C              DC       X1                  LINSC093
0040  1   007E              DC       Y1                  LINSC094
0041  1   0076              DC       I                   LINSC095
0042  0   1010              SLA      16                  LINSC096
0043  0   D032              STO      I                   LINSC097
0044  0   70EE              MDX      L2                  LINSC098
                      *                                  LINSC099
0045  0   710B        EXIT  MDX    1 11                  LINSC100
0046  0   69B9              STX    1 LINSC               LINSC101
0047  00  65000000    XR1   LDX  L1 *-*                  LINSC102
0049  00  66000000    XR2   LDX  L2 *-*                  LINSC103
004B  00  67000000    XR3   LDX  L3 *-*                  LINSC104
004D  01  4C800000          BSC  I  LINSC                LINSC105
                      *                                  LINSC106
004F  0   0000        REDCT DC       0                   LINSC107
0050  20  064C4000          LIBF     FLD                 LINSC108
0051  0   0000        X     DC       *-*                 LINSC109
0052  00  C5800005          LD    I1 5                   LINSC110
0054  01  4C08005C          BSC  L   R1,+                LINSC111
0056  20  06044100          LIBF     FADD                LINSC112
0057  1   0082              DC       DMN                 LINSC113
0058  30  064D5000          CALL     FLN                 LINSC114
005A  20  06517A00          LIBF     FMPY                LINSC115
005B  1   0080              DC       CON                 LINSC116
005C  20  068A4080    R1    LIBF     FSUB                LINSC117
005D  0   0000        XMIN  DC       *-*                 LINSC118
005E  20  06109940          LIBF     FDIV                LINSC119
005F  0   0000        DX    DC       *-*                 LINSC120
0060  20  068A3580          LIBF     FSTO                LINSC121
0061  1   007C              DC       X1                  LINSC122
0062  20  064C4000          LIBF     FLD                 LINSC123
```

```
0063 0  0000         Y      DC       *-*                  LINSC124
0064 00 C5800008            LD    I1 8                    LINSC125
0066 01 4C08006E            BSC   L  R2,+                 LINSC126
0068 20 06044100            LIBF     FADD                 LINSC127
0069 1  0082                DC       DMN                  LINSC128
006A 30 064D5000            CALL     FLN                  LINSC129
006C 20 06517A00            LIBF     FMPY                 LINSC130
006D 1  0080                DC       CON                  LINSC131
006E 20 068A4080     R2     LIBF     FSUB                 LINSC132
006F 0  0000         YMIN   DC       *-*                  LINSC133
0070 20 06109940            LIBF     FDIV                 LINSC134
0071 0  0000         DY     DC       *-*                  LINSC135
0072 20 068A3580            LIBF     FSTO                 LINSC136
0073 1  007E                DC       Y1                   LINSC137
0074 01 4C80004F            BSC   I  REDCT                LINSC138
                     *                                     LINSC139
                     *      CONSTANTS                      LINSC140
                     *                                     LINSC141
0076 30 174E3259     PLTIR  CALL     PLTIR                LINSC142
0076                 I      EQU      PLTIR                LINSC143
0078 0  0002         K2     DC       2                    LINSC144
0079 0  0003         K3     DC       3                    LINSC145
007A 0  0000         NX1    DC       0                    LINSC146
007B 0  0000         NY1    DC       0                    LINSC147
007C 00 00000000     X1     DEC      0                    LINSC148
007E 00 00000000     Y1     DEC      0                    LINSC149
0080 00 6F2DEC7F     CON    DEC      0.4342945            LINSC150
0082 0  4000         DMN    DC       /4000                LINSC151
0083 0  0000                DC       0                    LINSC152
0067                 TVLOC  EQU      103                  LINSC153
0084                        END                           LINSC154
```

NO ERRORS IN ABOVE ASSEMBLY.
LINSC DASSC
DUP FUNCTION COMPLETED

```
*****************************************************  LINSF002
*  IBM 1800 SUBROUTINES FOR CALCOMP 506/570.        *  LINSF003
*****************************************************  LINSF004
*                                                   *  LINSF005
*  SUBROUTINE LINSF/DASSF                           *  LINSF006
*                                                   *  LINSF007
*  CALLING SEQUENCE                                 *  LINSF008
*  ----------------                                 *  LINSF009
*  1.FORTRAN                                        *  LINSF010
*     EXTERNAL CALCF                                *  LINSF011
*     CALL LINSF(X,Y,N,NX,NY,IX,XMIN,DX,IFX,IY,     *  LINSF012
*                          YMIN,DY,IFY,CALCF)       *  LINSF013
*     CALL DASSF(X,Y,N,NX,NY,IX,XMIN,DX,IFX,IY,     *  LINSF014
*                          YMIN,DY,IFY,CALCF)       *  LINSF015
*  2.ASSEMBLER                                      *  LINSF016
*     CALL     LINSF                                *  LINSF017
*     DC       X          MATRIX OF X-COORDINATES   *  LINSF018
*     DC       Y          MATRIX OF Y-COORDINATES   *  LINSF019
*     DC       N          NUMBER OF VALUES          *  LINSF020
*     DC       NX         STEP FOR X-MATRIX         *  LINSF021
*     DC       NY         STEP FOR Y-MATRIX         *  LINSF022
*     DC       IX         INDICATOR FOR LIN. OR     *  LINSF023
*                         LOG. SCALE FOR X-AXIS     *  LINSF024
*     DC       XMIN       MIN. VALUE (OR LOG.) FOR  *  LINSF025
*                         THE GRADUATION OF X-AXIS  *  LINSF026
*     DC       DX         FUNCT. INCR. FOR 1CM      *  LINSF027
*     DC       IFX         0    X VALUES STORED AS  *  LINSF028
*                           MATRIX                  *  LINSF029
*                          NOT ZERO  X VALUES CALC.*  LINSF030
*                           BY SUBR. CALCF          *  LINSF031
*     DC       IY         INDICATOR FOR Y-AXIS      *  LINSF032
*     DC       YMIN       MIN.VALUE FOR Y-AXIS      *  LINSF033
*     DC       DY         FUNCT.INCR. OF 1CM ON     *  LINSF034
*                         Y-AXIS                    *  LINSF035
*     DC       IFY         0    Y VALUES STORED AS  *  LINSF036
*                           MATRIX                  *  LINSF037
*                          NOT ZERO  Y VALUES CALC.*  LINSF038
*                           BY SUBR. CALCF          *  LINSF039
*     CALL     CALCF       SUBR. FOR CALC. OF      *  LINSF040
*                          X AND/OR Y VALUES        *  LINSF041
*     CALL     DASSF                                *  LINSF042
*     DC       X                                    *  LINSF043
*     .                                             *  LINSF044
*     .                                             *  LINSF045
*     .                                             *  LINSF046
*     DC       IFY                                  *  LINSF047
*     CALL     CALCF                                *  LINSF048
*                                                   *  LINSF049
*****************************************************  LINSF050
0000     13255886          ENT      LINSF             LINSF051
0006     04062886          ENT      DASSF             LINSF052
0000 0   0000      LINSF    DC       0                 LINSF053
0001 0   6953              STX   1  XR1+1             LINSF054
0002 01  65800000          LDX   I1 LINSF             LINSF055
0004 0   C03B              LD       PLOT+1            LINSF056
0005 0   7005              MDX      L1                LINSF057
0006 0   0000      DASSF    DC       0                 LINSF058
0007 0   694D              STX   1  XR1+1             LINSF059
0008 01  65800006          LDX   I1 DASSF             LINSF060
000A 0   C052              LD       PLTIR+1           LINSF061
000B 0   D03F      L1      STO      CALL+1            LINSF062
```

```
000C 0  6A4A              STX   2 XR2+1                                LINSF063
000D 0  6B4B              STX   3 XR3+1                                LINSF064
000E 00 67800067          LDX  I3 TVLOC                                LINSF065
0010 0  C100              LD    1 0                                    LINSF066
0011 0  D067              STO     X+1                                  LINSF067
0012 0  C101              LD    1 1                                    LINSF068
0013 0  D07C              STO     Y+1                                  LINSF069
0014 00 C5800002          LD   I1 2                                    LINSF070
0016 01 4C080052          BSC  L  EXIT,+                               LINSF071
0018 0  D001              STO     *+1                                  LINSF072
0019 00 66000000          LDX  L2 *-*          XR2 HAS N               LINSF073
001B 00 C5800003          LD   I1 3                                    LINSF074
001D 0  1001              SLA     1                                    LINSF075
001E 0  D042              STO     NX1                                  LINSF076
001F 00 C5800004          LD   I1 4                                    LINSF077
0021 0  1001              SLA     1                                    LINSF078
0022 0  D03F              STO     NY1                                  LINSF079
0023 0  C106              LD    1 6                                    LINSF080
0024 01 D40000B0          STO  L  XMIN                                 LINSF081
0026 0  C107              LD    1 7                                    LINSF082
0027 01 D40000B2          STO  L  DX                                   LINSF083
0029 00 C5800008          LD   I1 8                                    LINSF084
002B 0  D039              STO     IFX                                  LINSF085
002C 0  C10A              LD    1 10                                   LINSF086
002D 01 D40000C2          STO  L  YMIN                                 LINSF087
002F 0  C10B              LD    1 11                                   LINSF088
0030 01 D40000C4          STO  L  DY                                   LINSF089
0032 00 C580000C          LD   I1 12                                   LINSF090
0034 0  D031              STO     IFY                                  LINSF091
0035 0  C10D              LD    1 13                                   LINSF092
0036 0  D04A              STO     CALC                                 LINSF093
0037 0  D060              STO     CALC1                                LINSF094
0038 0  C10E              LD    1 14                                   LINSF095
0039 0  D048              STO     CALC+1                               LINSF096
003A 0  D05E              STO     CALC1+1                              LINSF097
003B 0  C022              LD      K1                                   LINSF098
003C 0  D026              STO     NIX                                  LINSF099
003D 0  D026              STO     NIY                                  LINSF100
003E 0  4035              BSI     REDCT                                LINSF101
003F 30 174D68C0    PLOT  CALL      PLOT                             LINSF102
0041 1  006C              DC      X1                                   LINSF103
0042 1  006E              DC      Y1                                   LINSF104
0043 1  0060              DC      K3                                   LINSF105
0044 0  C01A              LD      K2                                   LINSF106
0045 0  D016              STO     I                                    LINSF107
0046 0  72FF        L2    MDX   2 -1                                   LINSF108
0047 0  7001              MDX     L3                                   LINSF109
0048 0  7009              MDX     EXIT                                 LINSF110
0049 0  402A        L3    BSI     REDCT                                LINSF111
004A 30 174D68C0    CALL  CALL      PLOT                             LINSF112
004C 1  006C              DC      X1                                   LINSF113
004D 1  006E              DC      Y1                                   LINSF114
004E 1  005C              DC      I                                    LINSF115
004F 0  1010              SLA     16                                   LINSF116
0050 0  D00B              STO     I                                    LINSF117
0051 0  70F4              MDX     L2                                   LINSF118
                    *                                                  LINSF119
0052 0  710F        EXIT  MDX   1 15                                   LINSF120
0053 0  69AC              STX   1 LINSF                                LINSF121
0054 00 65000000    XR1   LDX  L1 *-*                                  LINSF122
0056 00 66000000    XR2   LDX  L2 *-*                                  LINSF123
```

```
0058 00 67000000     XR3    LDX  L3 *-*                    LINSF124
005A 01 4C800000            BSC  I  LINSF                  LINSF125
                     *                                     LINSF126
                     *      CONSTANTS                      LINSF127
                     *                                     LINSF128
005C 30 174E3259     PLTIR  CALL    PLTIR                  LINSF129
005C                 I      EQU     PLTIR                  LINSF130
005E 0  0001         K1     DC      1                      LINSF131
005F 0  0002         K2     DC      2                      LINSF132
0060 0  0003         K3     DC      3                      LINSF133
0061 0  0000         NX1    DC      0                      LINSF134
0062 0  0000         NY1    DC      0                      LINSF135
0063 0  0000         NIX    DC      0                      LINSF136
0064 0  0000         NIY    DC      0                      LINSF137
0065 0  0000         IFX    DC      0                      LINSF138
0066 0  0000         IFY    DC      0                      LINSF139
0068 00 00000000     X0     DEC     0                      LINSF140
006A 00 00000000     Y0     DEC     0                      LINSF141
006C 00 00000000     X1     DEC     0                      LINSF142
006E 00 00000000     Y1     DEC     0                      LINSF143
0070 00 6F2DEC7F     CON    DEC     0.4342945              LINSF144
0072 0  4000         DMN    DC      /4000                  LINSF145
0073 0  0000                DC      0                      LINSF146
                     *                                     LINSF147
0074 0  0000         REDCT  DC      0                      LINSF148
0075 0  C0EF                LD      IFX                    LINSF149
0076 01 4C20007F            BSC  L  R1,Z                   LINSF150
0078 00 CC000000     X      LDD  L  *-*                    LINSF151
007A 0  D8ED                STD     X0                     LINSF152
007B 0  C0FD                LD      X+1                    LINSF153
007C 0  90E4                S       NX1                    LINSF154
007D 0  D0FB                STO     X+1                    LINSF155
007E 0  700D                MDX     R2                     LINSF156
007F 0  6907         R1     STX   1 *+7                    LINSF157
0080 0  6A08                STX   2 *+8                    LINSF158
0081 0  0000         CALC   DC      *-*                    LINSF159
0082 0  0000                DC      *-*                    LINSF160
0083 1  0068                DC      X0                     LINSF161
0084 1  0063                DC      NIX                    LINSF162
0085 1  0065                DC      IFX                    LINSF163
0086 00 65000000            LDX  L1 *-*                    LINSF164
0088 00 66000000            LDX  L2 *-*                    LINSF165
008A 01 74010063            MDX  L  NIX,1                  LINSF166
008C 0  C0D9         R2     LD      IFY                    LINSF167
008D 01 4C200096            BSC  L  R3,Z                   LINSF168
008F 00 CC000000     Y      LDD  L  *-*                    LINSF169
0091 0  D8D8                STD     Y0                     LINSF170
0092 0  C0FD                LD      Y+1                    LINSF171
0093 0  90CE                S       NY1                    LINSF172
0094 0  D0FB                STO     Y+1                    LINSF173
0095 0  700D                MDX     R4                     LINSF174
0096 0  6907         R3     STX   1 *+7                    LINSF175
0097 0  6A08                STX   2 *+8                    LINSF176
0098 0  0000         CALC1  DC      *-*                    LINSF177
0099 0  0000                DC      *-*                    LINSF178
009A 1  006A                DC      Y0                     LINSF179
009B 1  0064                DC      NIY                    LINSF180
009C 1  0066                DC      IFY                    LINSF181
009D 00 65000000            LDX  L1 *-*                    LINSF182
009F 00 66000000            LDX  L2 *-*                    LINSF183
00A1 01 74010064            MDX  L  NIY,1                  LINSF184
```

```
00A3 20 064C4000     R4     LIBF      FLD      LINSF185
00A4 1  0068                DC        X0       LINSF186
00A5 00 C5800005            LD    I1  5        LINSF187
00A7 01 4C0800AF            BSC   L   R5,+     LINSF188
00A9 20 06044100            LIBF      FADD     LINSF189
00AA 1  0072                DC        DMN      LINSF190
00AB 30 064D5000            CALL      FLN      LINSF191
00AD 20 06517A00            LIBF      FMPY     LINSF192
00AE 1  0070                DC        CON      LINSF193
00AF 20 068A4080     R5     LIBF      FSUB     LINSF194
00B0 0  0000         XMIN   DC        *-*      LINSF195
00B1 20 06109940            LIBF      FDIV     LINSF196
00B2 0  0000         DX     DC        *-*      LINSF197
00B3 20 068A3580            LIBF      FSTO     LINSF198
00B4 1  006C                DC        X1       LINSF199
00B5 20 064C4000            LIBF      FLD      LINSF200
00B6 1  006A                DC        Y0       LINSF201
00B7 00 C5800009            LD    I1  9        LINSF202
00B9 01 4C0800C1            BSC   L   R6,+     LINSF203
00BB 20 06044100            LIBF      FADD     LINSF204
00BC 1  0072                DC        DMN      LINSF205
00BD 30 064D5000            CALL      FLN      LINSF206
00BF 20 06517A00            LIBF      FMPY     LINSF207
00C0 1  0070                DC        CON      LINSF208
00C1 20 068A4080     R6     LIBF      FSUB     LINSF209
00C2 0  0000         YMIN   DC        *-*      LINSF210
00C3 20 06109940            LIBF      FDIV     LINSF211
00C4 0  0000         DY     DC        *-*      LINSF212
00C5 20 068A3580            LIBF      FSTO     LINSF213
00C6 1  006E                DC        Y1       LINSF214
00C7 01 4C800074            BSC   I   REDCT    LINSF215
0067                 TVLOC  EQU       103      LINSF216
00CA                        END                LINSF217

      NO ERRORS IN ABOVE ASSEMBLY.
LINSF DASSF
DUP FUNCTION COMPLETED
```

```
                *****************************************************  MRKSC002
                *  IBM 1800 SUBROUTINES FOR CALCOMP 506/570.        *  MRKSC003
                *****************************************************  MRKSC004
                *                                                   *  MRKSC005
                *  SUBROUTINE MRKSC                                 *  MRKSC006
                *                                                   *  MRKSC007
                *  CALLING SEQUENCE                                 *  MRKSC008
                *  ----------------                                 *  MRKSC009
                *  1.FORTRAN                                        *  MRKSC010
                *     CALL MRKSC(X,Y,N,NX,NY,IX,XMIN,DX,IY,YMIN,    *  MRKSC011
                *                DY,EBC)                            *  MRKSC012
                *  2.ASSEMBLER                                      *  MRKSC013
                *     CALL     MRKSC                                *  MRKSC014
                *     DC       X          MATRIX OF X-VALUES        *  MRKSC015
                *     DC       Y          MATRIX OF Y-VALUES        *  MRKSC016
                *     DC       N          NUMBER OF SYMBOLS TO BE   *  MRKSC017
                *                         DESIGNED                  *  MRKSC018
                *     DC       NX         STEP FOR X-MATRIX         *  MRKSC019
                *     DC       NY         STEP FOR Y-MATRIX         *  MRKSC020
                *     DC       IX         IND. FOR TYPE OF X-AXIS   *  MRKSC021
                *     DC       XMIN       MIN.VALUE (OR LOG.) FOR   *  MRKSC022
                *                         GRADUATION OF X-AXIS      *  MRKSC023
                *     DC       DX         FUNCT. INCR. PER 1 CM     *  MRKSC024
                *     DC       IY         IND. FOR TYPE OF Y-AXIS   *  MRKSC025
                *     DC       YMIN       MIN. VALUE (OR LOG) FOR   *  MRKSC026
                *                         GRADUATION OF Y-AXIS      *  MRKSC027
                *     DC       DY         FUNCT. INCR. PER 1 CM     *  MRKSC028
                *     DC       EBC        SYMBOL TO BE DESIGNED     *  MRKSC029
                *                         (LEFT HAND SIDE ADJUSTED) *  MRKSC030
                *****************************************************  MRKSC031
0000     14652883          ENT      MRKSC                             MRKSC032
0000 0   0000      MRKSC  DC       0                                 MRKSC033
0001 0   695A             STX    1 XR1+1                             MRKSC034
0002 0   6A5B             STX    2 XR2+1                             MRKSC035
0003 0   6B5C             STX    3 XR3+1                             MRKSC036
0004 01  65800000         LDX   I1 MRKSC                             MRKSC037
0006 00  67800067         LDX   I3 TVLOC                             MRKSC038
0008 0   C100             LD     1 0                                 MRKSC039
0009 0   D01C             STO      X                                 MRKSC040
000A 0   C101             LD     1 1                                 MRKSC041
000B 0   D02C             STO      Y                                 MRKSC042
000C 00  C5800002         LD    I1 2                                 MRKSC043
000E 01  4C080059         BSC   L  EXIT,+                            MRKSC044
0010 0   D001             STO      *+1                               MRKSC045
0011 00  66000000         LDX   L2 *-*                               MRKSC046
0013 00  C5800003         LD    I1 3                                 MRKSC047
0015 0   1001             SLA      1                                 MRKSC048
0016 0   D05A             STO      NX1                               MRKSC049
0017 00  C5800004         LD    I1 4                                 MRKSC050
0019 0   1001             SLA      1                                 MRKSC051
001A 0   D057             STO      NY1                               MRKSC052
001B 0   C106             LD     1 6                                 MRKSC053
001C 0   D015             STO      XMIN                              MRKSC054
001D 0   C107             LD     1 7                                 MRKSC055
001E 0   D015             STO      DX                                MRKSC056
001F 0   C109             LD     1 9                                 MRKSC057
0020 0   D023             STO      YMIN                              MRKSC058
0021 0   C10A             LD     1 10                                MRKSC059
0022 0   D023             STO      DY                                MRKSC060
0023 0   C10B             LD     1 11                                MRKSC061
0024 0   D02A             STO      EBC                               MRKSC062
```

```
0025 20 064C4000    M1     LIBF      FLD                    MRKSC063
0026 0  0000        X      DC        *-*                    MRKSC064
0027 00 C5800005           LD    I1  5                      MRKSC065
0029 01 4C080031           BSC   L   M2,+                   MRKSC066
002B 20 06044100           LIBF      FADD                   MRKSC067
002C 1  0068               DC        DMN                    MRKSC068
002D 30 064D5000           CALL      FLN                    MRKSC069
002F 20 06517A00           LIBF      FMPY                   MRKSC070
0030 1  006E               DC        CON                    MRKSC071
0031 20 068A4080    M2     LIBF      FSUB                   MRKSC072
0032 0  0000        XMIN   DC        *-*                    MRKSC073
0033 20 06109940           LIBF      FDIV                   MRKSC074
0034 0  0000        DX     DC        *-*                    MRKSC075
0035 20 068A3580           LIBF      FSTO                   MRKSC076
0036 1  0064               DC        X1                     MRKSC077
0037 20 064C4000           LIBF      FLD                    MRKSC078
0038 0  0000        Y      DC        *-*                    MRKSC079
0039 00 C5800008           LD    I1  8                      MRKSC080
003B 01 4C080043           BSC   L   M3,+                   MRKSC081
003D 20 06044100           LIBF      FADD                   MRKSC082
003E 1  0068               DC        DMN                    MRKSC083
003F 30 064D5000           CALL      FLN                    MRKSC084
0041 20 06517A00           LIBF      FMPY                   MRKSC085
0042 1  006E               DC        CON                    MRKSC086
0043 20 068A4080    M3     LIBF      FSUB                   MRKSC087
0044 0  0000        YMIN   DC        *-*                    MRKSC088
0045 20 06109940           LIBF      FDIV                   MRKSC089
0046 0  0000        DY     DC        *-*                    MRKSC090
0047 20 068A3580           LIBF      FSTO                   MRKSC091
0048 1  0066               DC        Y1                     MRKSC092
0049 30 22A14093           CALL      SYMBL                  MRKSC093
004B 1  0064               DC        X1                     MRKSC094
004C 1  0066               DC        Y1                     MRKSC095
004D 1  006C               DC        DP3                    MRKSC096
004E 1  006A               DC        D0                     MRKSC097
004F 0  0000        EBC    DC        *-*                    MRKSC098
0050 1  0070               DC        K1                     MRKSC099
0051 0  C0D4               LD        X                      MRKSC100
0052 0  901E               S         NX1                    MRKSC101
0053 0  D0D2               STO       X                      MRKSC102
0054 0  C0E3               LD        Y                      MRKSC103
0055 0  901C               S         NY1                    MRKSC104
0056 0  D0E1               STO       Y                      MRKSC105
0057 0  72FF               MDX    2  -1                     MRKSC106
0058 0  70CC               MDX       M1                     MRKSC107
0059 01 740C0000    EXIT   MDX   L   MRKSC,12                MRKSC108
005B 00 65000000    XR1    LDX   L1  *-*                    MRKSC109
005D 00 66000000    XR2    LDX   L2  *-*                    MRKSC110
005F 00 67000000    XR3    LDX   L3  *-*                    MRKSC111
0061 01 4C800000           BSC   I   MRKSC                  MRKSC112
0064 00 00000000    X1     DEC       0                      MRKSC113
0066 00 00000000    Y1     DEC       0                      MRKSC114
0068 0  4000        DMN    DC        /4000                  MRKSC115
0069 0  0000               DC        0                      MRKSC116
006A 00 00000000    D0     DEC       0                      MRKSC117
006C 00 4CCCCC7F    DP3    DEC       0.3                    MRKSC118
006E 00 6F2DEC7F    CON    DEC       0.4342945              MRKSC119
0070 0  0001        K1     DC        1                      MRKSC120
0071 0  0000        NX1    DC        0                      MRKSC121
0072 0  0000        NY1    DC        0                      MRKSC122
0067                TVLOC  EQU       103                    MRKSC123
```

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0074                    END
     NO ERRORS IN ABOVE ASSEMBLY.
MRKSC
DUP FUNCTION COMPLETED
```

```
*****************************************************  MRKSF002
*  IBM 1800 SUBROUTINES FOR CALCOMP 506/570.        *  MRKSF003
*****************************************************  MRKSF004
*                                                   *  MRKSF005
*  SUBROUTINE MRKSF                                 *  MRKSF006
*                                                   *  MRKSF007
*  CALLING SEQUENCE                                 *  MRKSF008
*  ---------------                                  *  MRKSF009
*  1.FORTRAN                                        *  MRKSF010
*     EXTERNAL CALCF                                *  MRKSF011
*     CALL MRKSF(X,Y,N,NX,NY,IX,XMIN,DX,IFX,IY,     *  MRKSF012
*                          YMIN,DY,IFY,CALCF,EBC)   *  MRKSF013
*  2.ASSEMBLER                                      *  MRKSF014
*     CALL     MRKSF                                *  MRKSF015
*     DC       X          MATRIX OF X-VALUES        *  MRKSF016
*     DC       Y          MATRIX OF Y-VALUES        *  MRKSF017
*     DC       N          NUMBER OF SYMBOLS TO BE   *  MRKSF018
*                         DESIGNED                  *  MRKSF019
*     DC       NX         STEP FOR X-MATRIX         *  MRKSF020
*     DC       NY         STEP FOR Y-MATRIX         *  MRKSF021
*     DC       IX         IND. FOR TYPE OF X-AXIS   *  MRKSF022
*     DC       XMIN       MIN.VALUE (OR LOG.) FOR   *  MRKSF023
*                         GRADUATION OF X-AXIS      *  MRKSF024
*     DC       DX         FUNCT. INCR. PER 1 CM     *  MRKSF025
*     DC       IFX         0    X VALUES STORED AS  *  MRKSF026
*                              MATRIX               *  MRKSF027
*                         NOT ZERO  Y VALUES CALC.  *  MRKSF028
*                              BY SUBR. CALCF       *  MRKSF029
*     DC       IY         IND. FOR TYPE OF Y-AXIS   *  MRKSF030
*     DC       YMIN       MIN. VALUE (OR LOG) FOR   *  MRKSF031
*                         GRADUATION OF Y-AXIS      *  MRKSF032
*     DC       DY         FUNCT. INCR. PER 1 CM     *  MRKSF033
*     DC       IFY         0    X VALUES STORED AS  *  MRKSF034
*                              MATRIX               *  MRKSF035
*                         NOT ZERO  Y VALUES CALC.  *  MRKSF036
*                              BY SUBR. CALCF       *  MRKSF037
*     CALL     CALCF      SUBROUTINE FOR CALC. OF   *  MRKSF038
*                          X  AND/OR Y VALUES       *  MRKSF039
*     DC       EBC        SYMBOL TO BE DESIGNED     *  MRKSF040
*                         (LEFT HAND SIDE ADJUSTED)*  MRKSF041
*****************************************************  MRKSF042
0000     14652886          ENT     MRKSF              MRKSF043
0000 0   0000      MRKSF   DC      0                  MRKSF044
0001 01  6D000096          STX  L1 XR1+1              MRKSF045
0003 01  6E000098          STX  L2 XR2+1              MRKSF046
0005 01  6F00009A          STX  L3 XR3+1              MRKSF047
0007 01  65800000          LDX  I1 MRKSF              MRKSF048
0009 00  67800067          LDX  I3 TVLOC              MRKSF049
000B 0   C100              LD    1 0                  MRKSF050
000C 0   D02E              STO     X+1                MRKSF051
000D 0   C101              LD    1 1                  MRKSF052
000E 0   D043              STO     Y+1                MRKSF053
000F 00  C5800002          LD   I1 2                  MRKSF054
0011 01  4C080093          BSC  L  EXIT,+             MRKSF055
0013 0   D001              STO     *+1                MRKSF056
0014 00  66000000          LDX  L2 *-*                MRKSF057
0016 0   C10D              LD    1 13                 MRKSF058
```

```
0017 0  D02B            STO     CALC          MRKSF059
0018 0  D041            STO     CALC1         MRKSF060
0019 0  C10E            LD    1 14            MRKSF061
001A 0  D029            STO     CALC+1        MRKSF062
001B 0  D03F            STO     CALC1+1       MRKSF063
001C 0  C106            LD    1 6             MRKSF064
001D 0  D054            STO     XMIN          MRKSF065
001E 0  C107            LD    1 7             MRKSF066
001F 0  D054            STO     DX            MRKSF067
0020 0  C10A            LD    1 10            MRKSF068
0021 0  D062            STO     YMIN          MRKSF069
0022 0  C10B            LD    1 11            MRKSF070
0023 0  D062            STO     DY            MRKSF071
0024 00 C5800003        LD   I1 3             MRKSF072
0026 0  1001            SLA     1             MRKSF073
0027 0  D076            STO     NX1           MRKSF074
0028 00 C5800004        LD   I1 4             MRKSF075
002A 0  1001            SLA     1             MRKSF076
002B 0  D073            STO     NY1           MRKSF077
002C 00 C5800008        LD   I1 8             MRKSF078
002E 0  D071            STO     IFX           MRKSF079
002F 00 C580000C        LD   I1 12            MRKSF080
0031 0  D06F            STO     IFY           MRKSF081
0032 0  C10F            LD    1 15            MRKSF082
0033 0  D05B            STO     EBC           MRKSF083
0034 0  C068            LD      K1            MRKSF084
0035 0  D06C            STO     NIX           MRKSF085
0036 0  D06C            STO     NIY           MRKSF086
0037 0  C068      M1    LD      IFX           MRKSF087
0038 01 4C200041        BSC   L R1,Z          MRKSF088
003A 00 CC000000  X     LDD   L *-*           MRKSF089
003C 0  D867            STD     X0            MRKSF090
003D 0  C0FD            LD      X+1           MRKSF091
003E 0  905F            S       NX1           MRKSF092
003F 0  D0FB            STO     X+1           MRKSF093
0040 0  700D            MDX     R2            MRKSF094
0041 0  6907      R1    STX   1 *+7           MRKSF095
0042 0  6A08            STX   2 *+8           MRKSF096
0043 0  0000      CALC  DC      *-*           MRKSF097
0044 0  0000            DC      *-*           MRKSF098
0045 1  00A4            DC      X0            MRKSF099
0046 1  00A2            DC      NIX           MRKSF100
0047 1  00A0            DC      IFX           MRKSF101
0048 00 65000000        LDX   L1 *-*          MRKSF102
004A 00 66000000        LDX   L2 *-*          MRKSF103
004C 01 740100A2        MDX   L NIX,1         MRKSF104
004E 0  C052      R2    LD      IFY           MRKSF105
004F 01 4C200058        BSC   L R3,Z          MRKSF106
0051 00 CC000000  Y     LDD   L *-*           MRKSF107
0053 0  D852            STD     Y0            MRKSF108
0054 0  C0FD            LD      Y+1           MRKSF109
0055 0  9049            S       NY1           MRKSF110
0056 0  D0FB            STO     Y+1           MRKSF111
0057 0  700D            MDX     R4            MRKSF112
0058 0  6907      R3    STX   1 *+7           MRKSF113
0059 0  6A08            STX   2 *+8           MRKSF114
005A 0  0000      CALC1 DC      *-*           MRKSF115
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```
005B 0  0000              DC      *-*                 MRKSF116
005C 1  00A6              DC      YO                  MRKSF117
005D 1  00A3              DC      NIY                 MRKSF118
005E 1  00A1              DC      IFY                 MRKSF119
005F 00 65000000          LDX   L1 *-*                 MRKSF120
0061 00 66000000          LDX   L2 *-*                 MRKSF121
0063 01 740100A3          MDX   L  NIY,1               MRKSF122
0065 20 064C4000    R4    LIBF     FLD                 MRKSF123
0066 1  00A4              DC       XO                  MRKSF124
0067 00 C5800005          LD    I1 5                   MRKSF125
0069 01 4C080071          BSC   L  M2,+                MRKSF126
006B 20 06044100          LIBF     FADD                MRKSF127
006C 1  00AC              DC       DMN                 MRKSF128
006D 30 064D5000          CALL     FLN                 MRKSF129
006F 20 06517A00          LIBF     FMPY                MRKSF130
0070 1  00B2              DC       CON                 MRKSF131
0071 20 068A4080    M2    LIBF     FSUB                MRKSF132
0072 0  0000        XMIN  DC       *-*                 MRKSF133
0073 20 06109940          LIBF     FDIV                MRKSF134
0074 0  0000        DX    DC       *-*                 MRKSF135
0075 20 068A3580          LIBF     FSTO                MRKSF136
0076 1  00A8              DC       X1                  MRKSF137
0077 20 064C4000          LIBF     FLD                 MRKSF138
0078 1  00A6              DC       YO                  MRKSF139
0079 00 C5800009          LD    I1 9                   MRKSF140
007B 01 4C080083          BSC   L  M3,+                MRKSF141
007D 20 06044100          LIBF     FADD                MRKSF142
007E 1  00AC              DC       DMN                 MRKSF143
007F 30 064D5000          CALL     FLN                 MRKSF144
0081 20 06517A00          LIBF     FMPY                MRKSF145
0082 1  00B2              DC       CON                 MRKSF146
0083 20 068A4080    M3    LIBF     FSUB                MRKSF147
0084 0  0000        YMIN  DC       *-*                 MRKSF148
0085 20 06109940          LIBF     FDIV                MRKSF149
0086 0  0000        DY    DC       *-*                 MRKSF150
0087 20 068A3580          LIBF     FSTO                MRKSF151
0088 1  00AA              DC       Y1                  MRKSF152
0089 30 22A14093          CALL     SYMBL               MRKSF153
008B 1  00A8              DC       X1                  MRKSF154
008C 1  00AA              DC       Y1                  MRKSF155
008D 1  00B0              DC       DP3                 MRKSF156
008E 1  00AE              DC       DO                  MRKSF157
008F 0  0000        EBC   DC       *-*                 MRKSF158
0090 1  009D              DC       K1                  MRKSF159
0091 0  72FF              MDX    2 -1                  MRKSF160
0092 0  70A4              MDX      M1                  MRKSF161
0093 01 74100000    EXIT  MDX   L  MRKSF,16            MRKSF162
0095 00 65000000    XR1   LDX   L1 *-*                 MRKSF163
0097 00 66000000    XR2   LDX   L2 *-*                 MRKSF164
0099 00 67000000    XR3   LDX   L3 *-*                 MRKSF165
009B 01 4C800000          BSC   I  MRKSF               MRKSF166
009D 0  0001        K1    DC       1                   MRKSF167
009E 0  0000        NX1   DC       0                   MRKSF168
009F 0  0000        NY1   DC       0                   MRKSF169
00A0 0  0000        IFX   DC       0                   MRKSF170
00A1 0  0000        IFY   DC       0                   MRKSF171
00A2 0  0000        NIX   DC       0                   MRKSF172
```

```
00A3 0  0000          NIY    DC      0                MRKSF173
00A4 00 00000000      XO     DEC     0                MRKSF174
00A6 00 00000000      YO     DEC     0                MRKSF175
00A8 00 00000000      X1     DEC     0                MRKSF176
00AA 00 00000000      Y1     DEC     0                MRKSF177
00AC 0  4000          DMN    DC      /4000            MRKSF178
00AD 0  0000                 DC      0                MRKSF179
00AE 00 00000000      D0     DEC     0                MRKSF180
00B0 00 4CCCCC7F      DP3    DEC     0.3              MRKSF181
00B2 00 6F2DEC7F      CON    DEC     0.4342945        MRKSF182
0067                  TVLOC  EQU     103              MRKSF183
00B4                         END                      MRKSF184

     NO ERRORS IN ABOVE ASSEMBLY.
MRKSF
DUP FUNCTION COMPLETED
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```
*****************************************************  DESSN002
*   IBM 1800 SUBROUTINES FOR CALCOMP 506/570.       *  DESSN003
*****************************************************  DESSN004
*                                                   *  DESSN005
*   SUBROUTINE DESSN                                *  DESSN006
*                                                   *  DESSN007
*   CALLING SEQUENCE                                *  DESSN008
*   ----------------                                *  DESSN009
*   1.FORTRAN                                       *  DESSN010
*      CALL DFSSN(X,Y,N,NX,NY,M,MX,MY,SIZX,SIZY,    *  DESSN011
*                 EBCX,NOX,EBCY,NOY,NC)             *  DESSN012
*   2.ASSEMBLER                                     *  DESSN013
*      CALL     DESSN                               *  DESSN014
*      DC       X          MATRIX OF X-VALUES       *  DESSN015
*      DC       Y          MATRIX OF Y-VALUES       *  DESSN016
*      DC       N          NUMBER OF PAIRS (X,Y) TO *  DESSN017
*                          BE TAKEN FROM BOTH MATR. *  DESSN018
*      DC       NX         STEP IN X-MATRIX         *  DESSN019
*      DC       NY         STEP IN Y-MATRIX         *  DESSN020
*      DC       M          NUMBER OF CURVES         *  DESSN021
*      DC       MX         STEP IN X-MATRIX TO FIND *  DESSN022
*                          THE BEGIN OF NEXT CURVE  *  DESSN023
*      DC       MY         STEP IN Y-MATRIX TO FIND *  DESSN024
*                          THE BEGIN OF NEXT CURVE  *  DESSN025
*      DC       SIZX       LENGTH X-AXIS            *  DESSN026
*      DC       SIZY       LENGTH Y-AXIS            *  DESSN027
*      DC       EBCX       LABEL OF X-AXIS          *  DESSN028
*      DC       NOX        POS.OF LABEL, NO. OF CHAR*  DESSN029
*      DC       EBCY       LABEL OF Y-AXIS          *  DESSN030
*      DC       NOY        POS. OF LABEL,NO.OF CHAR.*  DESSN031
*      DC       NC         0   FULL LINE            *  DESSN032
*                          1   DASHED LINE          *  DESSN033
*                          -1  LINE MARKED BY SYMB. *  DESSN034
*                                                   *  DESSN035
*****************************************************  DESSN036
```

```
0000     04162895          ENT     DESSN                          DESSN037
0000 0   0000        DESSN DC      0                              DESSN038
0001 01  6D000106          STX  L1  XR1+1                          DESSN039
0003 01  6E000108          STX  L2  XR2+1                          DESSN040
0005 01  6F00010A          STX  L3  XR3+1                          DESSN041
0007 01  65800000          LDX  I1  DESSN                          DESSN042
0009 01  6600010D          LDX  L2  R                              DESSN043
000B 00  67800067          LDX  I3  TVLOC                          DESSN044
000D 0   C100              LD    1  0                              DESSN045
000E 0   D03F              STO      X                              DESSN046
000F 0   D2CC              STO   2  X1-R                           DESSN047
0010 0   C101              LD    1  1                              DESSN048
0011 0   D053              STO      Y                              DESSN049
0012 0   D2CD              STO   2  Y1-R                           DESSN050
0013 00  C5800002          LD    I1 2                              DESSN051
0015 01  4C080103          BSC  L   EXIT,+                         DESSN052
0017 0   D231              STO   2  N-R                            DESSN053
0018 0   922F              S     2  K1-R                           DESSN054
0019 0   D232              STO   2  N1-R                           DESSN055
001A 00  C5800003          LD    I1 3                              DESSN056
001C 0   D233              STO   2  NX-R                           DESSN057
001D 0   A232              M     2  N1-R                           DESSN058
001E 0   1091              SLT      17                             DESSN059
001F 0   D237              STO   2  NNX-R                          DESSN060
0020 00  C5800004          LD    I1 4                              DESSN061
0022 0   D239              STO   2  NY-R                           DESSN062
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```
0023 0  A232              M     2 N1-R                    DESSN063
0024 0  1091              SLT    17                       DESSN064
0025 0  D200              STO   2 NNY-R                   DESSN065
0026 00 C5800005          LD    I1 5                      DESSN066
0028 01 4C080103          BSC   L  EXIT,+                 DESSN067
002A 0  D232              STO   2 M-R                     DESSN068
002B 00 C5800006          LD    I1 6                      DESSN069
002D 0  1001              SLA    1                        DESSN070
002E 0  D236              STO   2 MX-R                    DESSN071
002F 00 C5800007          LD    I1 7                      DESSN072
0031 0  1001              SLA    1                        DESSN073
0032 0  D23C              STO   2 MY-R                    DESSN074
0033 00 CD800008          LDD   I1 8                      DESSN075
0035 0  DA13              STD   2 SIZX-R                  DESSN076
0036 0  C10A              LD    1 10                      DESSN077
0037 0  D061              STO     EBCX                    DESSN078
0038 0  C10B              LD    1 11                      DESSN079
0039 0  D060              STO     NOX                     DESSN080
003A 0  C10C              LD    1 12                      DESSN081
003B 0  D072              STO     EBCY                    DESSN082
003C 0  C10D              LD    1 13                      DESSN083
003D 0  D071              STO     NOY                     DESSN084
003E 00 C580000E          LD    I1 14                     DESSN085
0040 0  D204              STO   2 NC-R                    DESSN086
0041 00 CD800009          LDD   I1 9                      DESSN087
0043 01 4C2800B4          BSC   L  D30,+Z                 DESSN088
0045 0  DA1B              STD   2 SIZY-R                  DESSN089
                  *                                       DESSN090
                  *       SEARCH XMAX,XMIN                DESSN091
                  *                                       DESSN092
0046 0  CA27              LDD   2 MINO-R                  DESSN093
0047 0  DA1D              STD   2 YMAX-R                  DESSN094
0048 0  CA25              LDD   2 MAXO-R                  DESSN095
0049 0  DA1F              STD   2 YMIN-R                  DESSN096
004A 01 6580013F          LDX   I1 M                      DESSN097
004C 30 149D4540    D5    CALL    MXMN                    DESSN098
004E 0  0000        X     DC      *-*                     DESSN099
004F 1  013E              DC      N                       DESSN100
0050 1  0140              DC      NX                      DESSN101
0051 1  0114              DC      SAVE1                   DESSN102
0052 1  0116              DC      SAVE2                   DESSN103
0053 0  401D              BSI     CMAX                    DESSN104
0054 0  C0F9              LD      X                       DESSN105
0055 0  9236              S     2 MX-R                    DESSN106
0056 0  D0F7              STO     X                       DESSN107
0057 0  71FF              MDX   1 -1                      DESSN108
0058 0  70F3              MDX     D5                      DESSN109
0059 0  CA1D              LDD   2 YMAX-R                  DESSN110
005A 0  DA15              STD   2 XMAX-R                  DESSN111
005B 0  CA1F              LDD   2 YMIN-R                  DESSN112
005C 0  DA17              STD   2 XMIN-R                  DESSN113
                  *                                       DESSN114
                  *       SEARCH YMAX,YMIN                DESSN115
                  *                                       DESSN116
005D 0  CA27              LDD   2 MINO-R                  DESSN117
005E 0  DA1D              STD   2 YMAX-R                  DESSN118
005F 0  CA25              LDD   2 MAXO-R                  DESSN119
0060 0  DA1F              STD   2 YMIN-R                  DESSN120
0061 01 6580013F          LDX   I1 M                      DESSN121
0063 30 149D4540    D10   CALL    MXMN                    DESSN122
0065 0  0000        Y     DC      *-*                     DESSN123
```

```
0066 1  013E            DC      N                       DESSN124
0067 1  0146            DC      NY                      DESSN125
0068 1  0114            DC      SAVE1                   DESSN126
0069 1  0116            DC      SAVE2                   DESSN127
006A 0  4006            BSI     CMAX                    DESSN128
006B 0  C0F9            LD      Y                       DESSN129
006C 0  923C            S     2 MY-R                    DESSN130
006D 0  D0F7            STO     Y                       DESSN131
006E 0  71FF            MDX   1 -1                      DESSN132
006F 0  70F3            MDX     D10                     DESSN133
0070 0  7019            MDX     D11                     DESSN134
                *                                       DESSN135
0071 0  0000    CMAX    DC      0                       DESSN136
0072 20 064C4000        LIBF    FLD                     DESSN137
0073 1  0114            DC      SAVE1                   DESSN138
0074 20 068A4080        LIBF    FSUB                    DESSN139
0075 1  012A            DC      YMAX                    DESSN140
0076 20 068A3580        LIBF    FSTO                    DESSN141
0077 1  0118            DC      SAVE                    DESSN142
0078 0  C20B            LD    2 SAVE-R                  DESSN143
0079 01 4C28007D        BSC   L C1,+Z                   DESSN144
007B 0  CA07            LDD   2 SAVE1-R                 DESSN145
007C 0  DA1D            STD   2 YMAX-R                  DESSN146
007D 20 064C4000    C1  LIBF    FLD                     DESSN147
007E 1  0116            DC      SAVE2                   DESSN148
007F 20 068A4080        LIBF    FSUB                    DESSN149
0080 1  012C            DC      YMIN                    DESSN150
0081 20 068A3580        LIBF    FSTO                    DESSN151
0082 1  0118            DC      SAVE                    DESSN152
0083 0  C20B            LD    2 SAVE-R                  DESSN153
0084 01 4C900071        BSC   I CMAX,-                  DESSN154
0086 0  CA09            LDD   2 SAVE2-R                 DESSN155
0087 0  DA1F            STD   2 YMIN-R                  DESSN156
0088 01 4C800071        BSC   I CMAX                    DESSN157
                *                                       DESSN158
                *       CALCULATE THE SCALE,DESIGN THE X-AXIS   DESSN159
                *                                       DESSN160
008A 30 049C4A00    D11 CALL    DXDY                    DESSN161
008C 1  0120            DC      SIZX                    DESSN162
008D 1  0122            DC      XMAX                    DESSN163
008E 1  0124            DC      XMIN                    DESSN164
008F 1  011A            DC      DX                      DESSN165
0090 1  011C            DC      DX1                     DESSN166
0091 1  011E            DC      DLX                     DESSN167
0092 1  0145            DC      NEXPX                   DESSN168
0093 30 019C9880        CALL    AXIS                    DESSN169
0095 1  012E            DC      D0                      DESSN170
0096 1  012E            DC      D0                      DESSN171
0097 1  0120            DC      SIZX                    DESSN172
0098 1  012E            DC      D0                      DESSN173
0099 0  0000    EBCX    DC      *-*                     DESSN174
009A 0  0000    NOX     DC      *-*                     DESSN175
009B 1  0124            DC      XMIN                    DESSN176
009C 1  011C            DC      DX1                     DESSN177
009D 1  011E            DC      DLX                     DESSN178
009E 1  0145            DC      NEXPX                   DESSN179
                *                                       DESSN180
                *       CALCULATE THE SCALE, DESIGN THE Y-AXIS  DESSN181
                *                                       DESSN182
009F 30 049C4A00        CALL    DXDY                    DESSN183
00A1 1  0128            DC      SIZY                    DESSN184
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00A2 1  012A                DC      YMAX                DESSN185
00A3 1  012C                DC      YMIN                DESSN186
00A4 1  0126                DC      DY                  DESSN187
00A5 1  011C                DC      DY1                 DESSN188
00A6 1  011E                DC      DLY                 DESSN189
00A7 1  0145                DC      NEXPY               DESSN190
00A8 30 019C9880            CALL    AXIS                DESSN191
00AA 1  012E                DC      D0                  DESSN192
00AB 1  012E                DC      D0                  DESSN193
00AC 1  0128                DC      SIZY                DESSN194
00AD 1  0130                DC      D90P                DESSN195
00AE 0  0000        EBCY    DC      *-*                 DESSN196
00AF 0  0000        NOY     DC      *-*                 DESSN197
00B0 1  012C                DC      YMIN                DESSN198
00B1 1  011C                DC      DY1                 DESSN199
00B2 1  011E                DC      DLY                 DESSN200
00B3 1  0145                DC      NEXPY               DESSN201
                    *                                   DESSN202
                    *       DESIGN THE CURVES           DESSN203
                    *                                   DESSN204
00B4 0  1010        D30     SLA     16                  DESSN205
00B5 0  D202                STO   2 NF-R                DESSN206
00B6 0  9233                S     2 NX-R                DESSN207
00B7 0  D235                STO   2 NX2-R               DESSN208
00B8 0  1010                SLA     16                  DESSN209
00B9 0  9239                S     2 NY-R                DESSN210
00BA 0  D23B                STO   2 NY2-R               DESSN211
00BB 01 6580013F            LDX   I1 M                  DESSN212
00BD 01 7400010F    D31     MDX   L  NF,0               DESSN213
00BF 0  7006                MDX     D32                 DESSN214
00C0 01 6C00010F            STX   L  NF                 DESSN215
00C2 0  C233                LD    2 NX-R                DESSN216
00C3 0  D234                STO   2 NX1-R               DESSN217
00C4 0  C239                LD    2 NY-R                DESSN218
00C5 0  7005                MDX     D41                 DESSN219
00C6 0  1010        D32     SLA     16                  DESSN220
00C7 0  D202                STO   2 NF-R                DESSN221
00C8 0  C235                LD    2 NX2-R               DESSN222
00C9 0  D234                STO   2 NX1-R               DESSN223
00CA 0  C23B                LD    2 NY2-R               DESSN224
00CB 0  D23A        D41     STO   2 NY1-R               DESSN225
00CC 0  C204                LD    2 NC-R                DESSN226
00CD 01 4C2800F8            BSC   L  D60,+Z             DESSN227
00CF 01 4C2000D3            BSC   L  D42,Z              DESSN228
00D1 0  C201                LD    2 SCLIN+1-R           DESSN229
00D2 0  7001                MDX     D43                 DESSN230
00D3 0  C203        D42     LD    2 SCDAS+1-R           DESSN231
00D4 0  D003        D43     STO     D44+1               DESSN232
00D5 0  C076                LD      X7000               DESSN233
00D6 0  D00B                STO     AEBC1               DESSN234
00D7 30 220D3255    D44     CALL    SCLIN               DESSN235
00D9 0  0000        X1      DC      *-*                 DESSN236
00DA 0  0000        Y1      DC      *-*                 DESSN237
00DB 1  013E                DC      N                   DESSN238
00DC 1  0141                DC      NX1                 DESSN239
00DD 1  0147                DC      NY1                 DESSN240
00DE 1  0124                DC      XMIN                DESSN241
00DF 1  011A                DC      DX                  DESSN242
00E0 1  012C                DC      YMIN                DESSN243
00E1 1  0126                DC      DY                  DESSN244
00E2 0  0000        AEBC1   DC      *-*                 DESSN245
```

```
00E3 01 7400010F          MDX  L  NF,0                    DESSN246
00E5 0  7002              MDX     D50                     DESSN247
00E6 0  C23D              LD    2 ADD-R                   DESSN248
00E7 0  7001              MDX     D51                     DESSN249
00E8 0  C23E        D50   LD    2 SUB-R                   DESSN250
00E9 0  D002        D51   STO     D52                     DESSN251
00EA 0  D006              STO     D53                     DESSN252
00EB 0  C0ED              LD      X1                      DESSN253
00EC 01 94000144    D52   S    L  NNX                     DESSN254
00EE 0  9236              S     2 MX-R                    DESSN255
00EF 0  D0E9              STO     X1                      DESSN256
00F0 0  C0E9              LD      Y1                      DESSN257
00F1 01 9400010D    D53   S    L  NNY                     DESSN258
00F3 0  923C              S     2 MY-R                    DESSN259
00F4 0  D0E5              STO     Y1                      DESSN260
00F5 0  71FF              MDX   1 -1                      DESSN261
00F6 0  70C6              MDX     D31                     DESSN262
00F7 0  700B              MDX     EXIT                    DESSN263
00F8 0  691F        D60   STX   1 SAVE                    DESSN264
00F9 0  C045              LD      M                       DESSN265
00FA 0  901D              S       SAVE                    DESSN266
00FB 0  1890              SRT     16                      DESSN267
00FC 0  A840              D       K5                      DESSN268
00FD 0  1090              SLT     16                      DESSN269
00FE 0  8037              A       AEBC                    DESSN270
00FF 0  D0E2              STO     AEBC1                   DESSN271
0100 0  C011              LD      SCMRK+1                 DESSN272
0101 0  D0D6              STO     D44+1                   DESSN273
0102 0  70D4              MDX     D44                     DESSN274
                    *                                     DESSN275
0103 01 740F0000    EXIT  MDX  L  DESSN,15                DESSN276
0105 00 65000000    XR1   LDX  L1 *-*                     DESSN277
0107 00 66000000    XR2   LDX  L2 *-*                     DESSN278
0109 00 67000000    XR3   LDX  L3 *-*                     DESSN279
010B 01 4C800000          BSC  I  DESSN                   DESSN280
                    *                                     DESSN281
                    *     CONSTANTS AND WORK AREAS        DESSN282
                    *                                     DESSN283
010D 30 220D3255    SCLIN CALL    SCLIN                   DESSN284
010F 30 220C4062    SCDAS CALL    SCDAS                   DESSN285
0111 30 220D4652    SCMRK CALL    SCMRK                   DESSN286
0114 00 00000000    SAVE1 DEC     0                       DESSN287
0116 00 00000000    SAVE2 DEC     0                       DESSN288
0118 00 00000000    SAVE  DEC     0                       DESSN289
011A 00 00000000    DX    DEC     0                       DESSN290
011C 00 00000000    DX1   DEC     0                       DESSN291
011E 00 00000000    DLX   DEC     0                       DESSN292
0120 00 00000000    SIZX  DEC     0                       DESSN293
0122 00 00000000    XMAX  DEC     0                       DESSN294
0124 00 00000000    XMIN  DEC     0                       DESSN295
0126 00 00000000    DY    DEC     0                       DESSN296
011C                DY1   EQU     DX1                     DESSN297
011E                DLY   EQU     DLX                     DESSN298
0128 00 00000000    SIZY  DEC     0                       DESSN299
012A 00 00000000    YMAX  DEC     0                       DESSN300
012C 00 00000000    YMIN  DEC     0                       DESSN301
012E 00 00000000    D0    DEC     0                       DESSN302
0130 00 5A000087    D90P  DEC     90.                     DESSN303
0132 0  7FFF        MAX0  DC      /7FFF                   DESSN304
0133 0  FFFF              DC      /FFFF                   DESSN305
0134 0  8000        MIN0  DC      /8000                   DESSN306
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0135 0  01FF            DC      /01FF                   DESSN307
0136 1  0137    AEBC    DC      EBC                     DESSN308
0137 0  4A00    EBC     DC      /4A00                   DESSN309
0138 0  5F00            DC      /5F00                   DESSN310
0139 0  5A00            DC      /5A00                   DESSN311
013A 0  6D00            DC      /6D00                   DESSN312
013B 0  5E00            DC      /5E00                   DESSN313
013C 0  0001    K1      DC      1                       DESSN314
013D 0  0005    K5      DC      5                       DESSN315
013E 0  0000    N       DC      0                       DESSN316
013F 0  0000    M       DC      0                       DESSN317
013F            N1      EQU     M                       DESSN318
0140 0  0000    NX      DC      0                       DESSN319
0141 0  0000    NX1     DC      0                       DESSN320
0142 0  0000    NX2     DC      0                       DESSN321
0143 0  0000    MX      DC      0                       DESSN322
0144 0  0000    NNX     DC      0                       DESSN323
0145 0  0000    NEXPX   DC      0                       DESSN324
0146 0  0000    NY      DC      0                       DESSN325
0147 0  0000    NY1     DC      0                       DESSN326
0148 0  0000    NY2     DC      0                       DESSN327
0149 0  0000    MY      DC      0                       DESSN328
010D            NNY     EQU     SCLIN                   DESSN329
0145            NEXPY   EQU     NEXPX                   DESSN330
0111            NC      EQU     SCMRK                   DESSN331
010F            NF      EQU     SCDAS                   DESSN332
014A 0  8400    ADD     DC      /8400                   DESSN333
014B 0  9400    SUB     DC      /9400                   DESSN334
014C 0  7000    X7000   DC      /7000                   DESSN335
0067            TVLOC   EQU     103                     DESSN336
010D            R       EQU     SCLIN                   DESSN337
014E                    END                             DESSN338
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NO ERRORS IN ABOVE ASSEMBLY.

DESSN
DUP FUNCTION COMPLETED

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0054 01 65800149          LDX  I1 M                    DESNF116
0056 30 149D4546    D5    CALL    MXMNF                DESNF117
0058 0  0000        X     DC      *-*                  DESNF118
0059 1  0148              DC      N                    DESNF119
005A 1  014A              DC      NX                   DESNF120
005B 1  011E              DC      SAVE1                DESNF121
005C 1  0120              DC      SAVE2                DESNF122
005D 1  014F              DC      IFX                  DESNF123
005E 0  0000        CALL1 DC      *-*                  DESNF124
005F 0  0000              DC      *-*                  DESNF125
0060 0  402E              BSI     CMAX                 DESNF126
0061 01 74000014F         MDX  L  IFX,0                DESNF127
0063 0  7004              MDX     D6                   DESNF128
0064 0  C0F3              LD      X                    DESNF129
0065 0  923E              S    2  MX-R                  DESNF130
0066 0  D0F1              STO     X                    DESNF131
0067 0  7003              MDX     D7                   DESNF132
0068 0  C242        D6    LD   2  IFX-R                DESNF133
0069 0  820C              A    2  MIX-R                DESNF134
006A 0  D242              STO  2  IFX-R                DESNF135
006B 0  71FF        D7    MDX  1  -1                   DESNF136
006C 0  70E9              MDX     D5                   DESNF137
006D 0  CA27              LDD  2  YMAX-R               DESNF138
006E 0  DA1F              STD  2  XMAX-R               DESNF139
006F 0  CA29              LDD  2  YMIN-R               DESNF140
0070 0  DA21              STD  2  XMIN-R               DESNF141
                    *                                  DESNF142
                    *     SEARCH YMAX,YMIN             DESNF143
                    *                                  DESNF144
0071 0  CA31              LDD  2  MINO-R               DESNF145
0072 0  DA27              STD  2  YMAX-R               DESNF146
0073 0  CA2F              LDD  2  MAXO-R               DESNF147
0074 0  DA29              STD  2  YMIN-R               DESNF148
0075 01 65800149          LDX  I1 M                    DESNF149
0077 30 149D4546    D10   CALL    MXMNF                DESNF150
0079 0  0000        Y     DC      *-*                  DESNF151
007A 1  0148              DC      N                    DESNF152
007B 1  014D              DC      NY                   DESNF153
007C 1  011E              DC      SAVE1                DESNF154
007D 1  0120              DC      SAVE2                DESNF155
007E 1  0150              DC      IFY                  DESNF156
007F 0  0000        CALL2 DC      *-*                  DESNF157
0080 0  0000              DC      *-*                  DESNF158
0081 0  400D              BSI     CMAX                 DESNF159
0082 01 74000150          MDX  L  IFY,0                DESNF160
0084 0  7004              MDX     D11                  DESNF161
0085 0  C0F3              LD      Y                    DESNF162
0086 0  9241              S    2  MY-R                  DESNF163
0087 0  D0F1              STO     Y                    DESNF164
0088 0  7003              MDX     D12                  DESNF165
0089 0  C243        D11   LD   2  IFY-R                DESNF166
008A 0  820A              A    2  MIY-R                DESNF167
008B 0  D243              STO  2  IFY-R                DESNF168
008C 0  71FF        D12   MDX  1  -1                   DESNF169
008D 0  70E9              MDX     D10                  DESNF170
008E 0  7019              MDX     D15                  DESNF171
                    *                                  DESNF172
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008F 0  0000          CMAX  DC       0                          DESNF173
0090 20 064C4000            LIBF     FLD                        DESNF174
0091 1  011F                DC       SAVE1                      DESNF175
0092 20 068A4080            LIBF     FSUB                       DESNF176
0093 1  0134                DC       YMAX                       DESNF177
0094 20 068A3580            LIBF     FSTO                       DESNF178
0095 1  0122                DC       SAVE                       DESNF179
0096 0  C215                LD     2 SAVE-R                     DESNF180
0097 01 4C28009B            BSC  L   C1,+Z                      DESNF181
0099 0  CA11                LDD    2 SAVE1-R                    DESNF182
009A 0  DA27                STD    2 YMAX-R                     DESNF183
009B 20 064C4000      C1    LIBF     FLD                        DESNF184
009C 1  0120                DC       SAVE2                      DESNF185
009D 20 068A4080            LIBF     FSUB                       DESNF186
009E 1  0136                DC       YMIN                       DESNF187
009F 20 068A3580            LIBF     FSTO                       DESNF188
00A0 1  0122                DC       SAVE                       DESNF189
00A1 0  C215                LD     2 SAVE-R                     DESNF190
00A2 01 4C90008F            BSC  I   CMAX,-                     DESNF191
00A4 0  CA13                LDD    2 SAVE2-R                    DESNF192
00A5 0  DA29                STD    2 YMIN-R                     DESNF193
00A6 01 4C80008F            BSC  I   CMAX                       DESNF194
                      *                                         DESNF195
                      *     CALCULATE THE SCALE,DESIGN THE X-AXIS DESNF196
                      *                                         DESNF197
00A8 30 049C4A00      D15   CALL     DXDY                       DESNF198
00AA 1  012A                DC       SIZX                       DESNF199
00AB 1  012C                DC       XMAX                       DESNF200
00AC 1  012E                DC       XMIN                       DESNF201
00AD 1  0124                DC       DX                         DESNF202
00AE 1  0126                DC       DX1                        DESNF203
00AF 1  0128                DC       DLX                        DESNF204
00B0 1  014C                DC       NEXPX                      DESNF205
00B1 30 019C9880            CALL     AXIS                       DESNF206
00B3 1  0138                DC       DO                         DESNF207
00B4 1  0138                DC       DO                         DESNF208
00B5 1  012A                DC       SIZX                       DESNF209
00B6 1  0138                DC       DO                         DESNF210
00B7 0  0000          EBCX  DC       *-*                        DESNF211
00B8 0  0000          NOX   DC       *-*                        DESNF212
00B9 1  012E                DC       XMIN                       DESNF213
00BA 1  0126                DC       DX1                        DESNF214
00BB 1  0128                DC       DLX                        DESNF215
00BC 1  014C                DC       NEXPX                      DESNF216
                      *                                         DESNF217
                      *     CALCULATE THE SCALE, DESIGN THE Y-AXIS DESNF218
                      *                                         DESNF219
00BD 30 049C4A00            CALL     DXDY                       DESNF220
00BF 1  0132                DC       SIZY                       DESNF221
00C0 1  0134                DC       YMAX                       DESNF222
00C1 1  0136                DC       YMIN                       DESNF223
00C2 1  0130                DC       DY                         DESNF224
00C3 1  0126                DC       DY1                        DESNF225
00C4 1  0128                DC       DLY                        DESNF226
00C5 1  014C                DC       NEXPY                      DESNF227
00C6 30 019C9880            CALL     AXIS                       DESNF228
00C8 1  0138                DC       DO                         DESNF229
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00C9 1  0138                DC      D0                  DESNF230
00CA 1  0132                DC      SIZY                DESNF231
00CB 1  013A                DC      D90P                DESNF232
00CC 0  0000        EBCY    DC      *-*                 DESNF233
00CD 0  0000        NOY     DC      *-*                 DESNF234
00CE 1  0136                DC      YMIN                DESNF235
00CF 1  0126                DC      DY1                 DESNF236
00D0 1  0128                DC      DLY                 DESNF237
00D1 1  014C                DC      NEXPY               DESNF238
                    *                                   DESNF239
                    *       DESIGN THE CURVES           DESNF240
                    *                                   DESNF241
00D2 01 65800149    D30     LDX   I1 M                  DESNF242
00D4 0  C20E        D31     LD     2 NC-R               DESNF243
00D5 01 4C280102            BSC   L  D60,+Z             DESNF244
00D7 01 4C2000DB            BSC   L  D42,Z              DESNF245
00D9 0  C20B                LD     2 SCLIF+1-R          DESNF246
00DA 0  7001                MDX      D43                DESNF247
00DB 0  C20D        D42     LD     2 SCDAF+1-R          DESNF248
00DC 0  D003        D43     STO      D44+1              DESNF249
00DD 0  C246                LD     2 X7000-R            DESNF250
00DE 0  D00F                STO      AEBC1              DESNF251
00DF 30 220D3255    D44     CALL     SCLIN              DESNF252
00E1 0  0000        X1      DC       *-*                DESNF253
00E2 0  0000        Y1      DC       *-*                DESNF254
00E3 1  0148                DC       N                  DESNF255
00E4 1  014A                DC       NX                 DESNF256
00E5 1  014D                DC       NY                 DESNF257
00E6 1  012F                DC       XMIN               DESNF258
00E7 1  0124                DC       DX                 DESNF259
00E8 1  0151                DC       IFXX               DESNF260
00E9 1  0136                DC       YMIN               DESNF261
00EA 1  0130                DC       DY                 DESNF262
00EB 1  0152                DC       IFYY               DESNF263
00EC 0  0000        CALL3   DC       *-*                DESNF264
00ED 0  0000                DC       *-*                DESNF265
00EE 0  0000        AEBC1   DC       *-*                DESNF266
00EF 0  C244                LD     2 IFXX-R             DESNF267
00F0 01 4C1800F4            BSC   L  D46,+-             DESNF268
00F2 0  820C                A      2 MIX-R              DESNF269
00F3 0  D244                STO    2 IFXX-R             DESNF270
00F4 0  C245        D46     LD     2 IFYY-R             DESNF271
00F5 01 4C1800F9            BSC   L  D48,+-             DESNF272
00F7 0  820A                A      2 MIY-R              DESNF273
00F8 0  D245                STO    2 IFYY-R             DESNF274
00F9 0  C0E7        D48     LD       X1                 DESNF275
00FA 0  923E                S      2 MX-R               DESNF276
00FB 0  D0E5                STO      X1                 DESNF277
00FC 0  C0E5                LD       Y1                 DESNF278
00FD 0  9241                S      2 MY-R               DESNF279
00FE 0  D0E3                STO      Y1                 DESNF280
00FF 0  71FF                MDX    1 -1                 DESNF281
0100 0  70D3                MDX      D31                DESNF282
0101 0  700B                MDX      EXIT               DESNF283
0102 0  691F        D60     STX    1 SAVE               DESNF284
0103 0  C045                LD       M                  DESNF285
0104 0  901D                S        SAVE               DESNF286
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0105 0  1890              SRT     16                    DESNF287
0106 0  A840              D       K5                    DESNF288
0107 0  1090              SLT     16                    DESNF289
0108 0  8037              A       AEBC                  DESNF290
0109 0  D0E4              STO     AEBC1                 DESNF291
010A 0  C011              LD      SCMRF+1               DESNF292
010B 0  D0D4              STO     D44+1                 DESNF293
010C 0  70D2              MDX     D44                   DESNF294
                          *                             DESNF295
010D 01 74130000  EXIT    MDX  L  DESNF,19              DESNF296
010F 00 65000000  XR1     LDX  L1 *-*                   DESNF297
0111 00 66000000  XR2     LDX  L2 *-*                   DESNF298
0113 00 67000000  XR3     LDX  L3 *-*                   DESNF299
0115 01 4C800000          BSC  I  DESNF                 DESNF300
                          *                             DESNF301
                          *     CONSTANTS AND WORK AREAS DESNF302
                          *                             DESNF303
0117 30 220D3246  SCLIF   CALL    SCLIF                 DESNF304
0119 30 220C4046  SCDAF   CALL    SCDAF                 DESNF305
011B 30 220D4646  SCMRF   CALL    SCMRF                 DESNF306
011E 00 00000000  SAVE1   DEC     0                     DESNF307
0120 00 00000000  SAVE2   DEC     0                     DESNF308
0122 00 00000000  SAVE    DEC     0                     DESNF309
0124 00 00000000  DX      DEC     0                     DESNF310
0126 00 00000000  DX1     DEC     0                     DESNF311
0128 00 00000000  DLX     DEC     0                     DESNF312
012A 00 00000000  SIZX    DEC     0                     DESNF313
012C 00 00000000  XMAX    DEC     0                     DESNF314
012E 00 00000000  XMIN    DEC     0                     DESNF315
0130 00 00000000  DY      DEC     0                     DESNF316
0126              DY1     EQU     DX1                   DESNF317
0128              DLY     EQU     DLX                   DESNF318
0132 00 00000000  SIZY    DEC     0                     DESNF319
0134 00 00000000  YMAX    DEC     0                     DESNF320
0136 00 00000000  YMIN    DEC     0                     DESNF321
0138 00 00000000  D0      DEC     0                     DESNF322
013A 00 5A000087  D90P    DEC     90.                   DESNF323
013C 0  7FFF      MAX0    DC      /7FFF                 DESNF324
013D 0  FFFF              DC      /FFFF                 DESNF325
013E 0  8000      MIN0    DC      /8000                 DESNF326
013F 0  01FF              DC      /01FF                 DESNF327
0140 1  0141      AEBC    DC      EBC                   DESNF328
0141 0  4A00      EBC     DC      /4A00                 DESNF329
0142 0  5F00              DC      /5F00                 DESNF330
0143 0  5A00              DC      /5A00                 DESNF331
0144 0  6D00              DC      /6D00                 DESNF332
0145 0  5E00              DC      /5E00                 DESNF333
0146 0  0001      K1      DC      1                     DESNF334
0147 0  0005      K5      DC      5                     DESNF335
0148 0  0000      N       DC      0                     DESNF336
0149 0  0000      M       DC      0                     DESNF337
014A 0  0000      NX      DC      0                     DESNF338
014B 0  0000      MX      DC      0                     DESNF339
014C 0  0000      NEXPX   DC      0                     DESNF340
014D 0  0000      NY      DC      0                     DESNF341
014E 0  0000      MY      DC      0                     DESNF342
014F 0  0000      IFX     DC      *-*                   DESNF343
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0150 0  0000        IFY    DC      *-*          DESNF344
0151 0  0000        IFXX   DC      0            DESNF345
0152 0  0000        IFYY   DC      0            DESNF346
0119                MIX    EQU     SCDAF        DESNF347
0117                MIY    EQU     SCLIF        DESNF348
014C                NEXPY  EQU     NEXPX        DESNF349
011B                NC     EQU     SCMRF        DESNF350
0153 0  7000        X7000  DC      /7000        DESNF351
0067                TVLOC  EQU     103          DESNF352
010D                R      EQU     EXIT         DESNF353
0154                       END                  DESNF354
```

NO ERRORS IN ABOVE ASSEMBLY.

DESNF
DUP FUNCTION COMPLETED

```
*****************************************************  DESLG002
*  IBM 1800 SUBROUTINES FOR CALCOMP 506/570.        *  DESLG003
*****************************************************  DESLG004
*                                                   *  DESLG005
*  SUBROUTINE DESLG                                 *  DESLG006
*                                                   *  DESLG007
*  CALLING SEQUENCE                                 *  DESLG008
*  ----------------                                 *  DESLG009
*                                                   *  DESLG010
*  1.FORTRAN                                        *  DESLG011
*    CALL DESLG(X,Y,N,NX,NY,M,MX,MY,SIZX,SIZY,IX,*  *  DESLG012
*                        IY,EBCX,NOX,EBCY,NOY,NC)   *  DESLG013
*  2.ASSEMBLER                                      *  DESLG014
*    CALL    DESLG                                  *  DESLG015
*    DC      X          MATRIX X                    *  DESLG016
*    DC      Y          MATRIX Y                    *  DESLG017
*    DC      N          NO.OF POINTS IN ONE CURVE   *  DESLG018
*    DC      NX         STEP FOR X-MATRIX           *  DESLG019
*    DC      NY         STEP FOR Y-MATRIX           *  DESLG020
*    DC      M          NO. OF CURVES               *  DESLG021
*    DC      MX         STEP TO START NEXT CURVE    *  DESLG022
*    DC      MY         STEP TO START NEXT CURVE    *  DESLG023
*    DC      SIZX       LENGTH X-AXIS               *  DESLG024
*    DC      SIZY       LENGTH Y-AXIS               *  DESLG025
*    DC      IX         INDICATOR FOR X-AXIS        *  DESLG026
*    DC      IY         INDICATOR FOR Y-AXIS        *  DESLG027
*    DC      EBCX       LABEL X-AXIS                *  DESLG028
*    DC      NOX        NO.OF CHAR. IN LABEL        *  DESLG029
*    DC      EBCY       LABEL Y-AXIS                *  DESLG030
*    DC      NOY        NO. OF CHAR. IN LABEL       *  DESLG031
*    DC      NC         =0   FULL LINE              *  DESLG032
*                       =1   DASHED LINE            *  DESLG033
*                       =-1  SPECIAL SYMBOLS        *  DESLG034
*                                                   *  DESLG035
*****************************************************  DESLG036
0000     041624C7          ENT     DESLG                DESLG037
0000 0   0000      DESLG   DC      0                    DESLG038
0001 01  6D000152          STX  L1 XR1+1                DESLG039
0003 01  6E000154          STX  L2 XR2+1                DESLG040
0005 01  6F000156          STX  L3 XR3+1                DESLG041
0007 01  65800000          LDX  I1 DESLG                DESLG042
0009 01  66000123          LDX  L2 R                    DESLG043
000B 00  67800067          LDX  I3 TVLOC                DESLG044
000D 0   C100              LD    1 0                    DESLG045
000E 0   D055              STO     X                    DESLG046
000F 0   D200              STO   2 X1-R                 DESLG047
0010 0   C101              LD    1 1                    DESLG048
0011 0   D069              STO     Y                    DESLG049
0012 0   D201              STO   2 Y1-R                 DESLG050
0013 00  C5800002          LD   I1 2                    DESLG051
0015 01  4C08014F          BSC  L  EXIT,+               DESLG052
0017 0   D26C              STO   2 N-R                  DESLG053
0018 0   9264              S     2 K1-R                 DESLG054
0019 0   D26D              STO   2 N1-R                 DESLG055
001A 00  C5800003          LD   I1 3                    DESLG056
001C 0   D26E              STO   2 NX-R                 DESLG057
001D 0   A26D              M     2 N1-R                 DESLG058
001E 0   1091              SLT     17                   DESLG059
001F 0   D272              STO   2 NNX-R                DESLG060
0020 00  C5800004          LD   I1 4                    DESLG061
0022 0   D275              STO   2 NY-R                 DESLG062
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0023 0  A26D              M     2 N1-R                    DESLG063
0024 0  1091              SLT     17                      DESLG064
0025 0  D23E              STO   2 NNY-R                   DESLG065
0026 00 C5800005          LD    I1 5                      DESLG066
0028 01 4C08014F          BSC   L  EXIT,+                 DESLG067
002A 0  D26D              STO   2 M-R                     DESLG068
002B 00 C5800006          LD    I1 6                      DESLG069
002D 0  1001              SLA     1                       DESLG070
002E 0  D271              STO   2 MX-R                    DESLG071
002F 00 C5800007          LD    I1 7                      DESLG072
0031 0  1001              SLA     1                       DESLG073
0032 0  D238              STO   2 MY-R                    DESLG074
0033 00 CD800008          LDD   I1 8                      DESLG075
0035 0  DA4D              STD   2 SIZX-R                  DESLG076
0036 00 C580000A          LD    I1 10                     DESLG077
0038 0  D273              STO   2 IX-R                    DESLG078
0039 01 4C08003D          BSC   L  D1,+                   DESLG079
003B 0  C239              LD    2 MXMNL+1-R               DESLG080
003C 0  7001              MDX     D2                      DESLG081
003D 0  C237          D1  LD    2 MXMN+1-R                DESLG082
003E 0  D024          D2  STO     D5+1                    DESLG083
003F 00 C580000B          LD    I1 11                     DESLG084
0041 0  D236              STO   2 IY-R                    DESLG085
0042 01 4C080046          BSC   L  D3,+                   DESLG086
0044 0  C239              LD    2 MXMNL+1-R               DESLG087
0045 0  7001              MDX     D4                      DESLG088
0046 0  C237          D3  LD    2 MXMN+1-R                DESLG089
0047 0  D032          D4  STO     D10+1                   DESLG090
0048 0  C10C              LD    1 12                      DESLG091
0049 0  D069              STO     EBCX1                   DESLG092
004A 0  D07E              STO     EBCX2                   DESLG093
004B 0  C10D              LD    1 13                      DESLG094
004C 0  D067              STO     NOX1                    DESLG095
004D 0  D07C              STO     NOX2                    DESLG096
004E 0  C10E              LD    1 14                      DESLG097
004F 0  D2BF              STO   2 EBCY1-R                 DESLG098
0050 0  D2D5              STO   2 EBCY2-R                 DESLG099
0051 0  C10F              LD    1 15                      DESLG100
0052 0  D2C0              STO   2 NOY1-R                  DESLG101
0053 0  D2D6              STO   2 NOY2-R                  DESLG102
0054 00 C5800010          LD    I1 16                     DESLG103
0056 0  D23C              STO   2 NC-R                    DESLG104
0057 00 CD800009          LDD   I1 9                      DESLG105
0059 01 4C2800FE          BSC   L  D30,+Z                 DESLG106
005B 0  DA55              STD   2 SIZY-R                  DESLG107
                      *                                   DESLG108
                      *   SEARCH XMAX,XMIN                DESLG109
                      *                                   DESLG110
005C 0  CA61              LDD   2 MINO-R                  DESLG111
005D 0  DA57              STD   2 YMAX-R                  DESLG112
005E 0  CA5F              LDD   2 MAXO-R                  DESLG113
005F 0  DA59              STD   2 YMIN-R                  DESLG114
0060 01 65800190          LDX   I1 M                      DESLG115
0062 30 149D4540      D5  CALL    MXMN                    DESLG116
0064 0  0000          X   DC      *-*                     DESLG117
0065 1  018F              DC      N                       DESLG118
0066 1  0191              DC      NX                      DESLG119
0067 1  0164              DC      SAVE1                   DESLG120
0068 1  0166              DC      SAVE2                   DESLG121
0069 0  401D              BSI     CMAX                    DESLG122
006A 0  C0F9              LD      X                       DESLG123
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006B  0   9271              S      2 MX-R                    DESLG124
006C  0   D0F7              STO      X                       DESLG125
006D  0   71FF              MDX    1 -1                      DESLG126
006E  0   70F3              MDX      D5                      DESLG127
006F  0   CA57              LDD    2 YMAX-R                  DESLG128
0070  0   DA4F              STD    2 XMAX-R                  DESLG129
0071  0   CA59              LDD    2 YMIN-R                  DESLG130
0072  0   DA51              STD    2 XMIN-R                  DESLG131
                        *                                    DESLG132
                        *     SEARCH YMAX,YMIN               DESLG133
                        *                                    DESLG134
0073  0   CA61              LDD    2 MINO-R                  DESLG135
0074  0   DA57              STD    2 YMAX-R                  DESLG136
0075  0   CA5F              LDD    2 MAXO-R                  DESLG137
0076  0   DA59              STD    2 YMIN-R                  DESLG138
0077  01  65800190          LDX   I1 M                       DESLG139
0079  30  149D4540    D10   CALL     MXMN                    DESLG140
007B  0   0000        Y     DC       *-*                     DESLG141
007C  1   018F              DC       N                       DESLG142
007D  1   0198              DC       NY                      DESLG143
007E  1   0164              DC       SAVE1                   DESLG144
007F  1   0166              DC       SAVE2                   DESLG145
0080  0   4006              BSI      CMAX                    DESLG146
0081  0   C0F9              LD       Y                       DESLG147
0082  0   9238              S      2 MY-R                    DESLG148
0083  0   D0F7              STO      Y                       DESLG149
0084  0   71FF              MDX    1 -1                      DESLG150
0085  0   70F3              MDX      D10                     DESLG151
0086  0   7019              MDX      D11                     DESLG152
                        *                                    DESLG153
0087  0   0000        CMAX  DC       0                       DESLG154
0088  20  064C4000          LIBF     FLD                     DESLG155
0089  1   0164              DC       SAVE1                   DESLG156
008A  20  068A4080          LIBF     FSUB                    DESLG157
008B  1   017A              DC       YMAX                    DESLG158
008C  20  068A3580          LIBF     FSTO                    DESLG159
008D  1   0168              DC       SAVE                    DESLG160
008E  0   C245              LD     2 SAVE-R                  DESLG161
008F  01  4C280093          BSC  L   C1,+Z                   DESLG162
0091  0   CA41              LDD    2 SAVE1-R                 DESLG163
0092  0   DA57              STD    2 YMAX-R                  DESLG164
0093  20  064C4000    C1    LIBF     FLD                     DESLG165
0094  1   0166              DC       SAVE2                   DESLG166
0095  20  068A4080          LIBF     FSUB                    DESLG167
0096  1   017C              DC       YMIN                    DESLG168
0097  20  068A3580          LIBF     FSTO                    DESLG169
0098  1   0168              DC       SAVE                    DESLG170
0099  0   C245              LD     2 SAVE-R                  DESLG171
009A  01  4C900087          BSC   I  CMAX,-                  DESLG172
009C  0   CA43              LDD    2 SAVE2-R                 DESLG173
009D  0   DA59              STD    2 YMIN-R                  DESLG174
009E  01  4C800087          BSC   I  CMAX                    DESLG175
                        *                                    DESLG176
                        *     CALCULATE THE SCALE, DESIGN THE X-AXIS  DESLG177
                        *                                    DESLG178
00A0  0   C273        D11   LD     2 IX-R                    DESLG179
00A1  01  4C0800BA          BSC  L   D20,+                   DESLG180
00A3  30  049D31C0          CALL     DXLG                    DESLG181
00A5  1   0170              DC       SIZX                    DESLG182
00A6  1   0172              DC       XMAX                    DESLG183
00A7  1   0174              DC       XMIN                    DESLG184
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00A8 1  016A              DC      DX                    DESLG185
00A9 1  016E              DC      NTX                   DESLG186
00AA 1  016F              DC      K4X                   DESLG187
00AB 1  016C              DC      UNITX                 DESLG188
00AC 1  017E              DC      K0                    DESLG189
00AD 30 019D3587          CALL    AXLOG                 DESLG190
00AF 1  017E              DC      D0                    DESLG191
00B0 1  017E              DC      D0                    DESLG192
00B1 1  0170              DC      SIZX                  DESLG193
00B2 1  017E              DC      D0                    DESLG194
00B3 0  0000        EBCX1 DC      *-*                   DESLG195
00B4 0  0000        NOX1  DC      *-*                   DESLG196
00B5 1  0174              DC      XMIN                  DESLG197
00B6 1  016E              DC      NTX                   DESLG198
00B7 1  016F              DC      K4X                   DESLG199
00B8 1  016C              DC      UNITX                 DESLG200
00B9 0  7015              MDX     D21                   DESLG201
00BA 30 049C4A00    D20   CALL    DXDY                  DESLG202
00BC 1  0170              DC      SIZX                  DESLG203
00BD 1  0172              DC      XMAX                  DESLG204
00BE 1  0174              DC      XMIN                  DESLG205
00BF 1  016A              DC      DX                    DESLG206
00C0 1  016C              DC      DX1                   DESLG207
00C1 1  016E              DC      DLX                   DESLG208
00C2 1  0197              DC      NEXPX                 DESLG209
00C3 30 019C9880          CALL    AXIS                  DESLG210
00C5 1  017E              DC      D0                    DESLG211
00C6 1  017E              DC      D0                    DESLG212
00C7 1  0170              DC      SIZX                  DESLG213
00C8 1  017E              DC      D0                    DESLG214
00C9 0  0000        EBCX2 DC      *-*                   DESLG215
00CA 0  0000        NOX2  DC      *-*                   DESLG216
00CB 1  0174              DC      XMIN                  DESLG217
00CC 1  016C              DC      DX1                   DESLG218
00CD 1  016E              DC      DLX                   DESLG219
00CE 1  0197              DC      NEXPX                 DESLG220
                    *                                   DESLG221
                    *     CALCULATE THE SCALE, DESIGN THE Y-AXIS  DESLG222
                    *                                   DESLG223
00CF 0  C236        D21   LD    2 IY-R                  DESLG224
00D0 01 4C0800E9          BSC  L  D22,+                 DESLG225
00D2 30 049D31C0          CALL    DXLG                  DESLG226
00D4 1  0178              DC      SIZY                  DESLG227
00D5 1  017A              DC      YMAX                  DESLG228
00D6 1  017C              DC      YMIN                  DESLG229
00D7 1  0176              DC      DY                    DESLG230
00D8 1  016E              DC      NTY                   DESLG231
00D9 1  016F              DC      K4Y                   DESLG232
00DA 1  016C              DC      UNITY                 DESLG233
00DB 1  017E              DC      K0                    DESLG234
00DC 30 019D3587          CALL    AXLOG                 DESLG235
00DE 1  017E              DC      D0                    DESLG236
00DF 1  017E              DC      D0                    DESLG237
00E0 1  0178              DC      SIZY                  DESLG238
00E1 1  0180              DC      D90P                  DESLG239
00E2 0  0000        EBCY1 DC      *-*                   DESLG240
00E3 0  0000        NOY1  DC      *-*                   DESLG241
00E4 1  017C              DC      YMIN                  DESLG242
00E5 1  016E              DC      NTY                   DESLG243
00E6 1  016F              DC      K4Y                   DESLG244
00E7 1  016C              DC      UNITY                 DESLG245
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00E8 0  7015              MDX     D30                          DESLG246
00E9 30 049C4A00  D22     CALL    DXDY                         DESLG247
00EB 1  0178              DC      SIZY                         DESLG248
00EC 1  017A              DC      YMAX                         DESLG249
00ED 1  017C              DC      YMIN                         DESLG250
00EE 1  0176              DC      DY                           DESLG251
00EF 1  016C              DC      DY1                          DESLG252
00F0 1  016E              DC      DLY                          DESLG253
00F1 1  0197              DC      NEXPY                        DESLG254
00F2 30 019C9880          CALL    AXIS                         DESLG255
00F4 1  017E              DC      D0                           DESLG256
00F5 1  017E              DC      D0                           DESLG257
00F6 1  0178              DC      SIZY                         DESLG258
00F7 1  0180              DC      D90P                         DESLG259
00F8 0  0000      EBCY2   DC      *-*                          DESLG260
00F9 0  0000      NOY2    DC      *-*                          DESLG261
00FA 1  017C              DC      YMIN                         DESLG262
00FB 1  016C              DC      DY1                          DESLG263
00FC 1  016E              DC      DLY                          DESLG264
00FD 1  0197              DC      NEXPY                        DESLG265
                  *                                            DESLG266
                  *       DESIGN THE CURVES                    DESLG267
                  *                                            DESLG268
00FE 0  1010      D30     SLA     16                           DESLG269
00FF 0  D23A              STO   2 NF-R                         DESLG270
0100 0  926E              S     2 NX-R                         DESLG271
0101 0  D270              STO   2 NX2-R                        DESLG272
0102 0  1010              SLA     16                           DESLG273
0103 0  9275              S     2 NY-R                         DESLG274
0104 0  D277              STO   2 NY2-R                        DESLG275
0105 01 65800190          LDX   I1 M                           DESLG276
0107 01 7400015D  D31     MDX   L NF,0                         DESLG277
0109 0  7006              MDX     D32                          DESLG278
010A 01 6C00015D          STX   L NF                           DESLG279
010C 0  C26E              LD    2 NX-R                         DESLG280
010D 0  D26F              STO   2 NX1-R                        DESLG281
010E 0  C275              LD    2 NY-R                         DESLG282
010F 0  7005              MDX     D41                          DESLG283
0110 0  1010      D32     SLA     16                           DESLG284
0111 0  D23A              STO   2 NF-R                         DESLG285
0112 0  C270              LD    2 NX2-R                        DESLG286
0113 0  D26F              STO   2 NX1-R                        DESLG287
0114 0  C277              LD    2 NY2-R                        DESLG288
0115 0  D276      D41     STO   2 NY1-R                        DESLG289
0116 0  C23C              LD    2 NC-R                         DESLG290
0117 01 4C280144          BSC   L D60,+Z                       DESLG291
0119 01 4C20011D          BSC   L D42,Z                        DESLG292
011B 0  C23B              LD    2 LINSC+1-R                    DESLG293
011C 0  7001              MDX     D43                          DESLG294
011D 0  C23D      D42     LD    2 DASSC+1-R                    DESLG295
011E 0  D003      D43     STO     D44+1                        DESLG296
011F 0  C263              LD    2 X7000-R                      DESLG297
0120 0  D00D              STO     AEBC1                        DESLG298
0121 30 13255883  D44     CALL    LINSC                        DESLG299
0123 0  0000      X1      DC      *-*                          DESLG300
0124 0  0000      Y1      DC      *-*                          DESLG301
0125 1  018F              DC      N                            DESLG302
0126 1  0192              DC      NX1                          DESLG303
0127 1  0199              DC      NY1                          DESLG304
0128 1  0196              DC      IX                           DESLG305
0129 1  0174              DC      XMIN                         DESLG306
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012A 1  016A                DC      DX                          DESLG307
012B 1  0159                DC      IY                          DESLG308
012C 1  017C                DC      YMIN                        DESLG309
012D 1  0176                DC      DY                          DESLG310
012E 0  0000          AEBC1 DC      *-*                         DESLG311
012F 01 7400015D            MDX   L NF,0                       DESLG312
0131 0  7002                MDX     D50                         DESLG313
0132 0  C278                LD    2 ADD-R                       DESLG314
0133 0  7001                MDX     D51                         DESLG315
0134 0  C279          D50   LD    2 SUB-R                       DESLG316
0135 0  D002          D51   STO     D52                         DESLG317
0136 0  D006                STO     D53                         DESLG318
0137 0  C0EB                LD      X1                          DESLG319
0138 01 94000195      D52   S     L NNX                         DESLG320
013A 0  9271                S     2 MX-R                        DESLG321
013B 0  D0E7                STO     X1                          DESLG322
013C 0  C0E7                LD      Y1                          DESLG323
013D 01 94000161      D53   S     L NNY                         DESLG324
013F 0  9238                S     2 MY-R                        DESLG325
0140 0  D0E3                STO     Y1                          DESLG326
0141 0  71FF                MDX   1 -1                          DESLG327
0142 0  70C4                MDX     D31                         DESLG328
0143 0  700B                MDX     EXIT                        DESLG329
0144 0  6923          D60   STX   1 SAVE                        DESLG330
0145 0  C04A                LD      M                           DESLG331
0146 0  9021                S       SAVE                        DESLG332
0147 0  1890                SRT     16                          DESLG333
0148 0  A83F                D       K5                          DESLG334
0149 0  1090                SLT     16                          DESLG335
014A 0  803E                A       AEBC                        DESLG336
014B 0  D0E2                STO     AEBC1                       DESLG337
014C 0  C015                LD      MRKSC+1                     DESLG338
014D 0  D0D4                STO     D44+1                       DESLG339
014E 0  70D2                MDX     D44                         DESLG340
                      *                                         DESLG341
                      *     RETURN TO THE CALLING PROGRAM       DESLG342
                      *                                         DESLG343
014F 01 74110000      EXIT  MDX   L DESLG,17                    DESLG344
0151 00 65000000      XR1   LDX   L1 *-*                        DESLG345
0153 00 66000000      XR2   LDX   L2 *-*                        DESLG346
0155 00 67000000      XR3   LDX   L3 *-*                        DESLG347
0157 01 4C800000            BSC   I DESLG                       DESLG348
                      *                                         DESLG349
                      *     CONSTANTS AND WORKAREAS             DESLG350
                      *                                         DESLG351
0159 30 149D4540      MXMN  CALL    MXMN.                       DESLG352
015B 30 149D4553      MXMNL CALL    MXMNL                       DESLG353
015D 30 13255883      LINSC CALL    LINSC                       DESLG354
015F 30 04062883      DASSC CALL    DASSC                       DESLG355
0161 30 14652883      MRKSC CALL    MRKSC                       DESLG356
0164 00 00000000      SAVE1 DEC     0                           DESLG357
0166 00 00000000      SAVE2 DEC     0                           DESLG358
0168 00 00000000      SAVE  DEC     0                           DESLG359
016A 00 00000000      DX    DEC     0                           DESLG360
016C 00 00000000      DX1   DEC     0                           DESLG361
016E 00 00000000      DLX   DEC     0                           DESLG362
016C                  UNITX EQU     DX1                         DESLG363
0170 00 00000000      SIZX  DEC     0                           DESLG364
0172 00 00000000      XMAX  DEC     0                           DESLG365
0174 00 00000000      XMIN  DEC     0                           DESLG366
0176 00 00000000      DY    DEC     0                           DESLG367
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016C                        DY1    EQU     DX1                 DESLG368
016E                        DLY    EQU     DLX                 DESLG369
016C                        UNITY  EQU     UNITX               DESLG370
0178 00 00000000            SIZY   DEC     0                   DESLG371
017A 00 00000000            YMAX   DEC     0                   DESLG372
017C 00 00000000            YMIN   DEC     0                   DESLG373
017E 00 00000000            D0     DEC     0                   DESLG374
0180 00 5A000087            D90P   DEC     90.                 DESLG375
0182 0  7FFF                MAX0   DC      /7FFF               DESLG376
0183 0  FFFF                       DC      /FFFF               DESLG377
0184 0  8000                MIN0   DC      /8000               DESLG378
0185 0  01FF                       DC      /01FF               DESLG379
0186 0  7000                X7000  DC      /7000               DESLG380
0187 0  0001                K1     DC      1                   DESLG381
0188 0  0005                K5     DC      5                   DESLG382
0189 1  018A                AEBC   DC      EBC                 DESLG383
018A 0  4A00                EBC    DC      /4A00               DESLG384
018B 0  5F00                       DC      /5F00               DESLG385
018C 0  5A00                       DC      /5A00               DESLG386
018D 0  6D00                       DC      /6D00               DESLG387
018E 0  5E00                       DC      /5E00               DESLG388
018F 0  0000                N      DC      0                   DESLG389
0190 0  0000                M      DC      0                   DESLG390
0190                        N1     EQU     M                   DESLG391
0191 0  0000                NX     DC      0                   DESLG392
0192 0  0000                NX1    DC                          DESLG393
0193 0  0000                NX2    DC                          DESLG394
016E                        NTX    EQU     DLX                 DESLG395
016F                        K4X    EQU     DLX+1               DESLG396
0194 0  0000                MX     DC      0                   DESLG397
0195 0  0000                NNX    DC      0                   DESLG398
0196 0  0000                IX     DC      0                   DESLG399
0197 0  0000                NEXPX  DC      0                   DESLG400
0198 0  0000                NY     DC      0                   DESLG401
0199 0  0000                NY1    DC                          DESLG402
019A 0  0000                NY2    DC                          DESLG403
016E                        NTY    EQU     NTX                 DESLG404
016F                        K4Y    EQU     K4X                 DESLG405
015B                        MY     EQU     MXMNL               DESLG406
0161                        NNY    EQU     MRKSC               DESLG407
0159                        IY     EQU     MXMN                DESLG408
0197                        NEXPY  EQU     NEXPX               DESLG409
019B 0  8400                ADD    DC      /8400               DESLG410
019C 0  9400                SUB    DC      /9400               DESLG411
015F                        NC     EQU     DASSC               DESLG412
015D                        NF     EQU     LINSC               DESLG413
017E                        K0     EQU     D0                  DESLG414
0123                        R      EQU     X1                  DESLG415
0067                        TVLOC  EQU     103                 DESLG416
019E                               END                         DESLG417
```

NO ERRORS IN ABOVE ASSEMBLY.

DESLG
DUP FUNCTION COMPLETED

```
0000      041624C6
0000 0    0000
0001 01   6D000150
0003 01   6E00015F
0005 01   6F000161
0007 01   65800000
0009 01   66000125
000B 00   67800067
000D 0    C100
000E 0    D061
000F 0    D206
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```
*****************************************************  DESLF002
*   IBM 1800 SUBROUTINES FOR CALCOMP 506/570.       *  DESLF003
*****************************************************  DESLF004
*                                                   *  DESLF005
*   SUBROUTINE DESLF                                *  DESLF006
*                                                   *  DESLF007
*   CALLING SEQUENCE                                *  DESLF008
*   ----------------                                *  DESLF009
*                                                   *  DESLF010
*   1.FORTRAN                                       *  DESLF011
*      EXTERNAL CALCF                               *  DESLF012
*      CALL DESLF(X,Y,N,NX,NY,M,MX,MY,SIZX,SIZY,IX,* DESLF013
*           IY,IFX,IFY,EBCX,NOX,EBCY,NOY,NC,CALCF)  * DESLF014
*   2.ASSEMBLER                                     *  DESLF015
*      CALL     DESLF                               *  DESLF016
*      DC       X          MATRIX X                 *  DESLF017
*      DC       Y          MATRIX Y                 *  DESLF018
*      DC       N          NO.OF POINTS IN ONE CURVE*  DESLF019
*      DC       NX         STEP FOR X-MATRIX        *  DESLF020
*      DC       NY         STEP FOR Y-MATRIX        *  DESLF021
*      DC       M          NO. OF CURVES            *  DESLF022
*      DC       MX         STEP TO START NEXT CURVE *  DESLF023
*      DC       MY         STEP TO START NEXT CURVE *  DESLF024
*      DC       SIZX       LENGTH X-AXIS            *  DESLF025
*      DC       SIZY       LENGTH Y-AXIS            *  DESLF026
*      DC       IX         INDICATOR FOR X-AXIS     *  DESLF027
*      DC       IY         INDICATOR FOR Y-AXIS     *  DESLF028
*      DC       IFX        0     X VALUES STORED AS *  DESLF029
*                          MATRIX                   *  DESLF030
*                          NOT ZERO  X VALUES CALC. *  DESLF031
*                                BY SUBR. CALCF     *  DESLF032
*      DC       IFY        0     Y VALUES STORED AS *  DESLF033
*                          MATRIX                   *  DESLF034
*                          NOT ZERO  Y VALUES CALC. *  DESLF035
*                                BY SUBR. CALCF     *  DESLF036
*      DC       EBCX       LABEL X-AXIS             *  DESLF037
*      DC       NOX        NO.OF CHAR. IN LABEL     *  DESLF038
*      DC       EBCY       LABEL Y-AXIS             *  DESLF039
*      DC       NOY        NO. OF CHAR. IN LABEL    *  DESLF040
*      DC       NC         =0   FULL LINE           *  DESLF041
*                          =1   DASHED LINE         *  DESLF042
*                          =-1  SPECIAL SYMBOLS     *  DESLF043
*      CALL     CALCF      SUBROUTINE FOR CALC. OF  *  DESLF044
*                          X  AND/OR Y VALUES       *  DESLF045
*                                                   *  DESLF046
*****************************************************  DESLF047
       ENT      DESLF                                   DESLF048
DESLF  DC       0                                       DESLF049
       STX   L1 XR1+1                                   DESLF050
       STX   L2 XR2+1                                   DESLF051
       STX   L3 XR3+1                                   DESLF052
       LDX   I1 DESLF                                   DESLF053
       LDX   L2 R                                       DESLF054
       LDX   I3 TVLOC                                   DESLF055
       LD     1 0                                       DESLF056
       STO      X                                       DESLF057
       STO    2 X1-R                                    DESLF058
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0010  0  C101              LD    1 1                    DESLF059
0011 01 D4000090          STO  L  Y                      DESLF060
0013  0  D207              STO    2 Y1-R                 DESLF061
0014 00 C5800002          LD    I1 2                    DESLF062
0016 01 4C08015A          BSC  L  EXIT,+                 DESLF063
0018  0  D274              STO    2 N-R                  DESLF064
0019 00 C5800003          LD    I1 3                    DESLF065
001B  0  D276              STO    2 NX-R                 DESLF066
001C 00 C5800004          LD    I1 4                    DESLF067
001E  0  D247              STO    2 NY-R                 DESLF068
001F 00 C5800005          LD    I1 5                    DESLF069
0021 01 4C08015A          BSC  L  EXIT,+                 DESLF070
0023  0  D275              STO    2 M-R                  DESLF071
0024 00 C5800006          LD    I1 6                    DESLF072
0026  0  D27E              STO    2 MIX-R                DESLF073
0027  0  1001              SLA      1                    DESLF074
0028  0  D277              STO    2 MX-R                 DESLF075
0029 00 C5800007          LD    I1 7                    DESLF076
002B  0  D27F              STO    2 MIY-R                DESLF077
002C  0  1001              SLA      1                    DESLF078
002D  0  D279              STO    2 MY-R                 DESLF079
002E 00 CD800008          LDD   I1 8                    DESLF080
0030  0  DA55              STD    2 SIZX-R               DESLF081
0031 00 C580000A          LD    I1 10                   DESLF082
0033  0  D278              STO    2 IX-R                 DESLF083
0034 01 4C080038          BSC  L  D1,+                   DESLF084
0036  0  C242              LD     2 MXMLF+1-R             DESLF085
0037  0  7001              MDX      D2                    DESLF086
0038  0  C240          D1  LD     2 MXMNF+1-R             DESLF087
0039  0  D035          D2  STO      D5+1                  DESLF088
003A 00 C580000B          LD    I1 11                   DESLF089
003C  0  D241              STO    2 IY-R                 DESLF090
003D 01 4C080041          BSC  L  D3,+                   DESLF091
003F  0  C242              LD     2 MXMLF+1-R             DESLF092
0040  0  7001              MDX      D4                    DESLF093
0041  0  C240          D3  LD     2 MXMNF+1-R             DESLF094
0042  0  D04C          D4  STO      D10+1                 DESLF095
0043 00 C580000C          LD    I1 12                   DESLF096
0045  0  D27A              STO    2 IFX-R                DESLF097
0046  0  D27C              STO    2 IFXX-R               DESLF098
0047 00 C580000D          LD    I1 13                   DESLF099
0049  0  D27B              STO    2 IFY-R                DESLF100
004A  0  D27D              STO    2 IFYY-R               DESLF101
004B 00 C5800012          LD    I1 18                   DESLF102
004D  0  D245              STO    2 NC-R                 DESLF103
004E  0  C10E              LD     1 14                   DESLF104
004F 01 D40000D1          STO  L  EBCX1                  DESLF105
0051  0  D2C2              STO    2 EBCX2-R              DESLF106
0052  0  C10F              LD     1 15                   DESLF107
0053  0  D07E              STO      NOX1                 DESLF108
0054  0  D2C3              STO    2 NOX2-R               DESLF109
0055  0  C110              LD     1 16                   DESLF110
0056  0  D2DB              STO    2 EBCY1-R              DESLF111
0057  0  D2F1              STO    2 EBCY2-R              DESLF112
0058  0  C111              LD     1 17                   DESLF113
0059  0  D2DC              STO    2 NOY1-R               DESLF114
005A  0  D2F2              STO    2 NOY2-R               DESLF115
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005B 0  C113              LD    1 19                    DESLF116
005C 0  D019              STO     CALL1                 DESLF117
005D 0  D038              STO     CALL2                 DESLF118
005E 0  D213              STO   2 CALL3-R               DESLF119
005F 0  C114              LD    1 20                    DESLF120
0060 0  D016              STO     CALL1+1               DESLF121
0061 0  D035              STO     CALL2+1               DESLF122
0062 0  D214              STO   2 CALL3+1-R             DESLF123
0063 00 CD800009          LDD  I1 9                     DESLF124
0065 01 4C28011C          BSC  L  D30,+Z                DESLF125
0067 0  DA5D              STD   2 SIZY-R                DESLF126
                     *                                  DESLF127
                     *    SEARCH XMAX,XMIN              DESLF128
                     *                                  DESLF129
0068 0  CA69              LDD   2 MINO-R                DESLF130
0069 0  DA5F              STD   2 YMAX-R                DESLF131
006A 0  CA67              LDD   2 MAXO-R                DESLF132
006B 0  DA61              STD   2 YMIN-R                DESLF133
006C 01 6580019A          LDX  I1 M                     DESLF134
006E 30 149D4546    D5    CALL    MXMNF                 DESLF135
0070 0  0000        X     DC      *-*                   DESLF136
0071 1  0199              DC      N                     DESLF137
0072 1  019B              DC      NX                    DESLF138
0073 1  016E              DC      SAVE1                 DESLF139
0074 1  0170              DC      SAVE2                 DESLF140
0075 1  019F              DC      IFX                   DESLF141
0076 0  0000        CALL1 DC      *-*                   DESLF142
0077 0  0000              DC      *-*                   DESLF143
0078 0  402C              BSI     CMAX                  DESLF144
0079 0  C27A              LD    2 IFX-R                 DESLF145
007A 01 4C18007F          BSC  L  D7,+-                 DESLF146
007C 0  827E              A     2 MIX-R                 DESLF147
007D 0  D27A              STO   2 IFX-R                 DESLF148
007E 0  7003              MDX     D8                    DESLF149
007F 0  C0F0        D7    LD      X                     DESLF150
0080 0  9277              S     2 MX-R                  DESLF151
0081 0  D0EE              STO     X                     DESLF152
0082 0  71FF        D8    MDX   1 -1                    DESLF153
0083 0  70EA              MDX     D5                    DESLF154
0084 0  CA5F              LDD   2 YMAX-R                DESLF155
0085 0  DA57              STD   2 XMAX-R                DESLF156
0086 0  CA61              LDD   2 YMIN-R                DESLF157
0087 0  DA59              STD   2 XMIN-R                DESLF158
                     *                                  DESLF159
                     *    SEARCH YMAX,YMIN              DESLF160
                     *                                  DESLF161
0088 0  CA69              LDD   2 MINO-R                DESLF162
0089 0  DA5F              STD   2 YMAX-R                DESLF163
008A 0  CA67              LDD   2 MAXO-R                DESLF164
008B 0  DA61              STD   2 YMIN-R                DESLF165
008C 01 65800019A         LDX  I1 M                     DESLF166
008E 30 149D4546    D10   CALL    MXMNF                 DESLF167
0090 0  0000        Y     DC      *-*                   DESLF168
0091 1  0199              DC      N                     DESLF169
0092 1  016C              DC      NY                    DESLF170
0093 1  016E              DC      SAVE1                 DESLF171
0094 1  0170              DC      SAVE2                 DESLF172
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0095 1  01A0          DC      IFY                    DESLF173
0096 0  0000   CALL2   DC      *-*                    DESLF174
0097 0  0000          DC      *-*                    DESLF175
0098 0  400C          BSI     CMAX                   DESLF176
0099 0  C27B          LD    2 IFY-R                  DESLF177
009A 01 4C18009F      BSC   L D11,+-                 DESLF178
009C 0  827F          A     2 MIY-R                  DESLF179
009D 0  D27B          STO   2 IFY-R                  DESLF180
009E 0  7003          MDX     D12                    DESLF181
009F 0  C0F0   D11    LD      Y                      DESLF182
00A0 0  9279          S     2 MY-R                   DESLF183
00A1 0  D0EE          STO     Y                      DESLF184
00A2 0  71FF   D12    MDX   1 -1                     DESLF185
00A3 0  70EA          MDX     D10                    DESLF186
00A4 0  7019          MDX     D15                    DESLF187
                      *                              DESLF188
00A5 0  0000   CMAX   DC      0                      DESLF189
00A6 20 064C4000      LIBF    FLD                    DESLF190
00A7 1  016E          DC      SAVE1                  DESLF191
00A8 20 068A4080      LIBF    FSUB                   DESLF192
00A9 1  0184          DC      YMAX                   DESLF193
00AA 20 068A3580      LIBF    FSTO                   DESLF194
00AB 1  0172          DC      SAVE                   DESLF195
00AC 0  C24D          LD    2 SAVE-R                 DESLF196
00AD 01 4C2800B1      BSC   L C1,+Z                  DESLF197
00AF 0  CA49          LDD   2 SAVE1-R                DESLF198
00B0 0  DA5F          STD   2 YMAX-R                 DESLF199
00B1 20 064C4000   C1     LIBF    FLD                DESLF200
00B2 1  0170          DC      SAVE2                  DESLF201
00B3 20 068A4080      LIBF    FSUB                   DESLF202
00B4 1  0186          DC      YMIN                   DESLF203
00B5 20 068A3580      LIBF    FSTO                   DESLF204
00B6 1  0172          DC      SAVE                   DESLF205
00B7 0  C24D          LD    2 SAVE-R                 DESLF206
00B8 01 4C9000A5      BSC   I CMAX,-                 DESLF207
00BA 0  CA4B          LDD   2 SAVE2-R                DESLF208
00BB 0  DA61          STD   2 YMIN-R                 DESLF209
00BC 01 4C8000A5      BSC   I CMAX                   DESLF210
                      *                              DESLF211
                      *     CALCULATE THE SCALE, DESIGN THE X-AXIS   DESLF212
                      *                              DESLF213
00BE 0  C278   D15    LD    2 IX-R                   DESLF214
00BF 01 4C0800D8      BSC   L D20,+                  DESLF215
00C1 30 049D31C0      CALL    DXLG                   DESLF216
00C3 1  017A          DC      SIZX                   DESLF217
00C4 1  017C          DC      XMAX                   DESLF218
00C5 1  017E          DC      XMIN                   DESLF219
00C6 1  0174          DC      DX                     DESLF220
00C7 1  0178          DC      NTX                    DESLF221
00C8 1  0179          DC      K4X                    DESLF222
00C9 1  0176          DC      UNITX                  DESLF223
00CA 1  0188          DC      K0                     DESLF224
00CB 30 019D3587      CALL    AXLOG                  DESLF225
00CD 1  0188          DC      D0                     DESLF226
00CE 1  0188          DC      D0                     DESLF227
00CF 1  017A          DC      SIZX                   DESLF228
00D0 1  0188          DC      D0                     DESLF229
```

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00D1  0   0000          EBCX1  DC      *-*                    DESLF230
00D2  0   0000          NOX1   DC      *-*                    DESLF231
00D3  1   017E                 DC      XMIN                   DESLF232
00D4  1   0178                 DC      NTX                    DESLF233
00D5  1   0179                 DC      K4X                    DESLF234
00D6  1   0176                 DC      UNITX                  DESLF235
00D7  0   7015                 MDX     D21                    DESLF236
00D8  30  049C4A00     D20     CALL    DXDY                   DESLF237
00DA  1   017A                 DC      SIZX                   DESLF238
00DB  1   017C                 DC      XMAX                   DESLF239
00DC  1   017E                 DC      XMIN                   DESLF240
00DD  1   0174                 DC      DX                     DESLF241
00DE  1   0176                 DC      DX1                    DESLF242
00DF  1   0178                 DC      DLX                    DESLF243
00E0  1   0168                 DC      NEXPX                  DESLF244
00E1  30  019C9880             CALL    AXIS                   DESLF245
00E3  1   0188                 DC      D0                     DESLF246
00E4  1   0188                 DC      D0                     DESLF247
00E5  1   017A                 DC      SIZX                   DESLF248
00E6  1   0188                 DC      D0                     DESLF249
00E7  0   0000          EBCX2  DC      *-*                    DESLF250
00E8  0   0000          NOX2   DC      *-*                    DESLF251
00E9  1   017E                 DC      XMIN                   DESLF252
00EA  1   0176                 DC      DX1                    DESLF253
00EB  1   0178                 DC      DLX                    DESLF254
00EC  1   0168                 DC      NEXPX                  DESLF255
                       *                                      DESLF256
                       *      CALCULATE THE SCALE, DESIGN THE Y-AXIS  DESLF257
                       *                                      DESLF258
00ED  0   CA41         D21     LDD   2 IY-R                   DESLF259
00EE  01  4C080107             BSC  L  D22,+                  DESLF260
00F0  30  049D31C0             CALL    DXLG                   DESLF261
00F2  1   0182                 DC      SIZY                   DESLF262
00F3  1   0184                 DC      YMAX                   DESLF263
00F4  1   0186                 DC      YMIN                   DESLF264
00F5  1   0180                 DC      DY                     DESLF265
00F6  1   0178                 DC      NTY                    DESLF266
00F7  1   0179                 DC      K4Y                    DESLF267
00F8  1   0176                 DC      UNITY                  DESLF268
00F9  1   0188                 DC      K0                     DESLF269
00FA  30  019D3587             CALL    AXLOG                  DESLF270
00FC  1   0188                 DC      D0                     DESLF271
00FD  1   0188                 DC      D0                     DESLF272
00FE  1   0182                 DC      SIZY                   DESLF273
00FF  1   018A                 DC      D90P                   DESLF274
0100  0   0000          EBCY1  DC      *-*                    DESLF275
0101  0   0000          NOY1   DC      *-*                    DESLF276
0102  1   0186                 DC      YMIN                   DESLF277
0103  1   0178                 DC      NTY                    DESLF278
0104  1   0179                 DC      K4Y                    DESLF279
0105  1   0176                 DC      UNITY                  DESLF280
0106  0   7015                 MDX     D30                    DESLF281
0107  30  049C4A00     D22     CALL    DXDY                   DESLF282
0109  1   0182                 DC      SIZY                   DESLF283
010A  1   0184                 DC      YMAX                   DESLF284
010B  1   0186                 DC      YMIN                   DESLF285
010C  1   0180                 DC      DY                     DESLF286
```

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010D 1  0176                DC      DY1                 DESLF287
010E 1  0178                DC      DLY                 DESLF288
010F 1  0168                DC      NEXPY               DESLF289
0110 30 019C9880            CALL    AXIS                DESLF290
0112 1  0188                DC      DO                  DESLF291
0113 1  0188                DC      DO                  DESLF292
0114 1  0182                DC      SIZY                DESLF293
0115 1  018A                DC      D90P                DESLF294
0116 0  0000        ERCY2   DC      *-*                 DESLF295
0117 0  0000        NOY2    DC      *-*                 DESLF296
0118 1  0186                DC      YMIN                DESLF297
0119 1  0176                DC      DY1                 DESLF298
011A 1  0178                DC      DLY                 DESLF299
011B 1  0168                DC      NFXPY               DESLF300
                    *                                   DESLF301
                    *       DESIGN THE CURVES           DESLF302
                    *                                   DESLF303
011C 01 65580019A   D30     LDX   I1 M                   DESLF304
011E 0  C245        D31     LD     2 NC-R               DESLF305
011F 01 4C28014F            BSC   L  D60,+Z             DESLF306
0121 01 4C200125            BSC   L  D42,Z              DESLF307
0123 0  C244                LD     2 LINSF+1-R          DESLF308
0124 0  7001                MDX      D43                DESLF309
0125 0  C246        D42     LD     2 DASSF+1-R          DESLF310
0126 0  D003        D43     STO      D44+1              DESLF311
0127 0  C26B                LD     2 X7000-R            DESLF312
0128 0  D011                STO      AEBC1              DESLF313
0129 30 13255886    D44     CALL     LINSF              DESLF314
012B 0  0000        X1      DC       *-*                DESLF315
012C 0  0000        Y1      DC       *-*                DESLF316
012D 1  0199                DC       N                  DESLF317
012E 1  019B                DC       NX                 DESLF318
012F 1  016C                DC       NY                 DESLF319
0130 1  019D                DC       IX                 DESLF320
0131 1  017E                DC       XMIN               DESLF321
0132 1  0174                DC       DX                 DESLF322
0133 1  01A1                DC       IFXX               DESLF323
0134 1  0166                DC       IY                 DESLF324
0135 1  0186                DC       YMIN               DESLF325
0136 1  0180                DC       DY                 DESLF326
0137 1  01A2                DC       IFYY               DESLF327
0138 0  0000        CALL3   DC       *-*                DESLF328
0139 0  0000                DC       *-*                DESLF329
013A 0  0000        AEBC1   DC       *-*                DESLF330
013B 0  C27C                LD     2 IFXX-R             DESLF331
013C 01 4C180141            BSC   L  D46,+-             DESLF332
013E 0  827E                A      2 MIX-R              DESLF333
013F 0  D27C                STO    2 IFXX-R             DESLF334
0140 0  827C                A      2 IFXX-R             DESLF335
0141 0  C27D        D46     LD     2 IFYY-R             DESLF336
0142 01 4C180146            BSC   L  D48,+-             DESLF337
0144 0  827F                A      2 MIY-R              DESLF338
0145 0  D27D                STO    2 IFYY-R             DESLF339
0146 0  C0E4        D48     LD       X1                 DESLF340
0147 0  9277                S      2 MX-R               DESLF341
0148 0  D0E2                STO      X1                 DESLF342
0149 0  C0E2                LD       Y1                 DESLF343
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014A 0  9279              S     2 MY-R                          DESLF344
014B 0  D0E0              STO     Y1                            DESLF345
014C 0  71FF              MDX   1 -1                            DESLF346
014D 0  70D0              MDX     D31                           DESLF347
014E 0  700B              MDX     EXIT                          DESLF348
014F 0  6922        D60   STX   1 SAVE                          DESLF349
0150 0  C049              LD      M                             DESLF350
0151 0  9020              S       SAVE                          DESLF351
0152 0  1890              SRT     16                            DESLF352
0153 0  A83E              D       K5                            DESLF353
0154 0  1090              SLT     16                            DESLF354
0155 0  803D              A       AEBC                          DESLF355
0156 0  D0E3              STO     AEBC1                         DESLF356
0157 0  C015              LD      MRKSF+1                       DESLF357
0158 0  D0D1              STO     D44+1                         DESLF358
0159 0  70CF              MDX     D44                           DESLF359
                    *                                         DESLF360
                    *     RETURN TO THE CALLING PROGRAM       DESLF361
                    *                                         DESLF362
015A 01 74150000    EXIT  MDX   L  DESLF,21                     DESLF363
015C 00 65000000    XR1   LDX   L1 *-*                          DESLF364
015E 00 66000000    XR2   LDX   L2 *-*                          DESLF365
0160 00 67000000    XR3   LDX   L3 *-*                          DESLF366
0162 01 4C800000          BSC   I  DESLF                        DESLF367
                    *                                         DESLF368
                    *     CONSTANTS AND WORKAREAS             DESLF369
                    *                                         DESLF370
0164 30 149D4546    MXMNF CALL     MXMNF                        DESLF371
0166 30 149D44C6    MXMLF CALL     MXMLF                        DESLF372
0168 30 13255886    LINSF CALL     LINSF                        DESLF373
016A 30 04062886    DASSF CALL     DASSF                        DESLF374
016C 30 14652886    MRKSF CALL     MRKSF                        DESLF375
016E 00 00000000    SAVE1 DEC      0                            DESLF376
0170 00 00000000    SAVE2 DEC      0                            DESLF377
0172 00 00000000    SAVE  DEC      0                            DESLF378
0174 00 00000000    DX    DEC      0                            DESLF379
0176 00 00000000    DX1   DEC      0                            DESLF380
0178 00 00000000    DLX   DEC      0                            DESLF381
0176                UNITX EQU      DX1                          DESLF382
017A 00 00000000    SIZX  DEC      0                            DESLF383
017C 00 00000000    XMAX  DEC      0                            DESLF384
017E 00 00000000    XMIN  DEC      0                            DESLF385
0180 00 00000000    DY    DEC      0                            DESLF386
0176                DY1   EQU      DX1                          DESLF387
0178                DLY   EQU      DLX                          DESLF388
0176                UNITY EQU      UNITX                        DESLF389
0182 00 00000000    SIZY  DEC      0                            DESLF390
0184 00 00000000    YMAX  DEC      0                            DESLF391
0186 00 00000000    YMIN  DEC      0                            DESLF392
0188 00 00000000    D0    DEC      0                            DESLF393
018A 00 5A000087    D90P  DEC      90.                          DESLF394
018C 0  7FFF        MAX0  DC       /7FFF                        DESLF395
018D 0  FFFF              DC       /FFFF                        DESLF396
018E 0  8000        MIN0  DC       /8000                        DESLF397
018F 0  01FF              DC       /01FF                        DESLF398
0190 0  7000        X7000 DC       /7000                        DESLF399
0191 0  0001        K1    DC       1                            DESLF400
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0192 0  0005        K5     DC      5                    DESLF401
0193 1  0194        AEBC   DC      EBC                  DESLF402
0194 0  4A00        EBC    DC      /4A00                DESLF403
0195 0  5F00               DC      /5F00                DESLF404
0196 0  5A00               DC      /5A00                DESLF405
0197 0  6D00               DC      /6D00                DESLF406
0198 0  5E00               DC      /5E00                DESLF407
0199 0  0000        N      DC      0                    DESLF408
019A 0  0000        M      DC      0                    DESLF409
019B 0  0000        NX     DC      0                    DESLF410
0178                NTX    EQU     DLX                  DESLF411
0179                K4X    EQU     DLX+1                DESLF412
019C 0  0000        MX     DC      0                    DESLF413
019D 0  0000        IX     DC      0                    DESLF414
0168                NEXPX  EQU     LINSF                DESLF415
016C                NY     EQU     MRKSF                DESLF416
0178                NTY    EQU     NTX                  DESLF417
0179                K4Y    EQU     K4X                  DESLF418
019E 0  0000        MY     DC      0                    DESLF419
0166                IY     EQU     MXMLF                DESLF420
019F 0  0000        IFX    DC      0                    DESLF421
01A0 0  0000        IFY    DC      0                    DESLF422
01A1 0  0000        IFXX   DC      0                    DESLF423
01A2 0  0000        IFYY   DC      0                    DESLF424
01A3 0  0000        MIX    DC      0                    DESLF425
01A4 0  0000        MIY    DC      0                    DESLF426
0168                NEXPY  EQU     NEXPX                DESLF427
01A5 0  8400        ADD    DC      /8400                DESLF428
01A6 0  9400        SUB    DC      /9400                DESLF429
016A                NC     EQU     DASSF                DESLF430
0188                K0     EQU     D0                   DESLF431
0125                R      EQU     MIY-127              DESLF432
0067                TVLOC  EQU     103                  DESLF433
01A8                       END                          DESLF434

     NO ERRORS IN ABOVE ASSEMBLY.
DESLF
DUP FUNCTION COMPLETED
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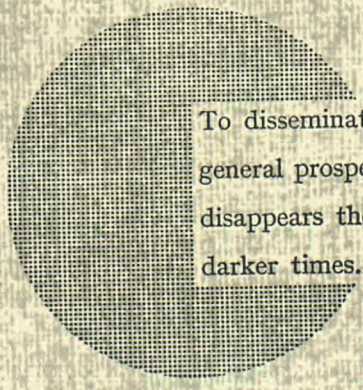

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Alfred Nobel

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