



# DECUS

## PROGRAM LIBRARY

DECUS NO.	8-193
TITLE	DISP
AUTHOR	Stephen G. Wellcome
COMPANY	Engineering Department Trinity College Hartford, Connecticut
DATE	March 11, 1969
SOURCE LANGUAGE	PAL-D

21030

FORMER MEMBER



A vertical line of text, likely a page number or a reference code, running down the right side of the page.

## DISP

DECUS Program Library Write-up

DECUS No. 8-193

### ABSTRACT

DISP provides a simple means of using the 34D Display with FORTRAN-D. It allows the operator to display varying numbers of points with movable X and Y axes.

### USAGE

The use of DISP is illustrated in the following example:

```
C;-----EXAMPLE OF USE OF DISP
```

```
DIMENSION IX(1),IY(1),NP(1),NX(100),NY(100)
```

```
PAUSE 3873
```

```
C;-----SET X-Y AXIS ORIGIN AT CENTER SCREEN
```

```
IX=500
```

```
IY=400
```

```
3 TYPE 2
```

```
2 FORMAT (/,"TYPE IN NP, LESS THAN 100")
```

```
ACCEPT 4, NP
```

```
4 FORMAT (I)
```

```
ENP=NP
```

```
DO 10 K=1,NP
```

```
X=K
```

```
NX(K)=X*1000./ENP
```

```
NY(K)=NX(K)
```

```
10 CONTINUE
```

```
PAUSE 4017
```

```
GO TO 3
```

```
END
```

IX(1), IY(1) give the coordinates for the zero point of the X and Y axes. IX=0, IY=0, puts the axis origin at the lower left corner of the scope face; IX=500, IY=400, puts the axis origin at the midscreen.

NP(1) gives the number of points to be displayed. In the example given, it can range from 1 to 100.

NX(100), NY(100), give the pairs of points to be displayed.

These may be DIMENSIONED to any size the user wishes, as long as it is greater than approximately 45 each.

This DIMENSION statement must be the first statement of the program. DISP searches for it to obtain the data needed for the display.

PAUSE 3873 should immediately follow the DIMENSION statement. The PAUSE 3873 transfers control to the part of DISP starting at \*7441. This moves the display portion of DISP to the top page of core, and leaves all the lower pages available for program and data. This destroys FORTRAN-D's Disk READ/WRITE option (e.g., READ 3,10, ALPA, is illegal) but this feature seemed expendable. A user who needs this feature could relocate the display section over the ARCTAN routine, if he so desired.

PAUSE 4017 transfers control to the display section of DISP. The (X,Y) pairs and the axes will be displayed until the user types either a CTRL/P or a CTRL/C. CTRL/P will return control to the first FORTRAN statement following the PAUSE 4017 (in this case, the GO TO 3 statement). CTRL/C will transfer control to a four-location bootstrap and call in the disk monitor.

For the four-location bootstrap to work, location 2000 of disk 0 must be 5200. This can easily be done using the program DISKLOOK (DECUS No. 8-111), or by fixing the system builder before loading begins. Changing location 2000 of disk 0 does not affect the operation of the system in any way.

The calling sequence for DISP is:

```
.FORT
*OUT-S:F
*
*IN-R:
*↑
↑
.DISP
↑
*READY
↑
```

ADD	7571
ADDR	0710
ADRESX	7574
ADRESY	7575
BREAK	7551
CONT	7460
COUNT	7567
C200A	6503
C203	6701
DATA	7530
DISPX	7474
DISPY	7510
DX	7565
DXL	6053
DXS	6057
DY	7566
DYL	6063
DYS	6067
ENDS	2332
ENDSI	0722
ERROR	0647
ERR1	0701
FLGCHK	7537
GRID	7466
HORD	0707
HTEST	0672
ID	7570
LIST	0731
LOC	7576
LOOP	7525
MCTRLP	7564
MONITR	0712
MONRET	0131
MOVE	7441
MOVE1	0725
M1130	0715
M1131	0716
M1620	0717
M1630	0713
M1631	0714
M203	6702
M6000	0720
M7400	0721
NP	7573
PRDG	7557
P2604	0711
P5377	7561
SLAP	0011
START	7461
STMI	0727
SVSRSN	0127
TEMP	0726
_JOP	7560

TP1 0704  
 TP2 0705  
 TP3 0706  
 TYPE 0664  
 WORD 0730  
 XLDC 0723  
 XSET 7562  
 YLOC 0724  
 YORIG 7572  
 YSET 7563

/S.G. WELCOME - TRINITY COLLEGE  
 / "DISP" - A PROGRAM TO PROVIDE OSCILLOSCOPE  
 /DISPLAY CAPABILITY IN FORTRAN-D.  
 /PARTS ARE BORROWED FROM DEC-DR-AFAS-LA.  
 /  
 /CALLING SEQUENCE: SAME AS FORTRAN-D SYMBOLPRINT  
 /  
 /ERROR CODES:  
 /TILT #1 - COMPILER NOT IN CORE  
 /TILT #2 - PROG. CALLS FOR DISK READ/WRITE  
 /TILT #3 - IMPROPER DIMENSION STATEMENT  
 /TILT #4 - NY(K) STORAGE LIMIT > \*MOVE

\*600

0600 6046 TLS  
 0601 7200 CLA  
 0602 1131 TAD MONRET  
 0603 1704 TAD I TP1  
 0604 1705 TAD I TP2  
 0605 1706 TAD I TP3  
 0606 7640 SZA CLA /IS COMPILER IN CORE?  
 0607 5301 JMP ERR1

0610 1727 TAD I STMT  
 0611 1320 TAD M6000  
 0612 7700 SMA CLA /DID PROG. "DEFINE DISK"?  
 0613 4247 JMS ERROR  
 0614 0262 262

0615 1315 TAD M1130 /PROPER "DIMENSION" STATEMENT?  
 0616 4272 JMS HTEST  
 0617 1316 TAD M1131  
 0620 4272 JMS HTEST  
 0621 1317 TAD M1620  
 0622 4272 JMS HTEST  
 0623 1313 TAD M1630  
 0624 4272 JMS HTEST  
 0625 1314 TAD M1631  
 0626 4272 JMS HTEST

0627 1325 TAD MOVE1  
 0630 7041 CIA  
 0631 1711 TAD I P2604  
 0632 7700 SMA CLA /NY(K) LIMIT BELOW \*MOVE?  
 0633 4247 JMS ERROR  
 0634 0264 264

```

/
/
0635 1247 TAD ERROR
0636 7640 SZA CLA /WERE THERE ERRORS?
0637 5712 JMP I MONITR /YES-ABANDON SHIP

```

```

/
/
/OK, NOW GET S.A. OF NX, NY STORAGE
/

```

```

0640 1710 TAD I ADDR
0641 2310 ISZ ADDR
0642 3723 DCA I XLLOC
0643 1710 TAD I ADDR
0644 3724 DCA I YLOC
0645 4527 JMS I SVSRSN /BAIL OUT, LOAD FOSL AND GO
0646 0011 SLAP

```

```

/
/
0647 0000 ERROR, 0
0650 1330 TAD WORD
0651 3326 DCA TEMP
0652 1726 TAD I TEMP
0653 2326 ISZ TEMP
0654 7450 SNA
0655 5260 JMP .+3
0656 4264 JMS TYPE
0657 5252 JMP .-5
0660 1647 TAD I ERROR
0661 2247 ISZ ERROR
0662 4264 JMS TYPE
0663 5647 JMP I ERROR

```

```

/
0664 0000 TYPE, 0
0665 6041 TSF
0666 5265 JMP .-1
0667 6046 TLS
0670 7200 CLA
0671 5664 JMP I TYPE

```

```

/
0672 0000 HTEST, 0
0673 1707 TAD I HORD
0674 2307 ISZ HORD
0675 7640 SZA CLA
0676 4247 JMS ERROR
0677 0263 263
0700 5672 JMP I HTEST

```

```

/
0701 4247 ERR1, JMS ERROR
0702 0261 261
0703 5712 JMP I MONITR

```

```

/
/CONSTANTS
/

```

```

MUNRET=131
SLAP=11
ENDS=2332
C200A=6503
C203=6701
M203=6702
SVSRSN=127

```

```

/
0704 6503 TP1, C200A
0705 6701 TP2, C203
0706 6702 TP3, M203
0707 2400 HORD, 2400
0710 2603 ADDR, 2603
0711 2604 P2604, 2604
0712 7600 MONITR, 7600
0713 6150 M1630, -1630
0714 6147 M1631, -1631
0715 6650 M1130, -1130
0716 6647 M1131, -1131
0717 6160 M1620, -1620
0720 2000 M6000, -6000
0721 0400 M7400, -7400
0722 2332 ENDS1, ENDS
0723 7574 XLOC, ADRESX
0724 7575 YLOC, ADRESY
0725 7441 MOVE1, MOVE
0726 0000 TEMP, 0
0727 1002 SIMT, 1002
0730 0731 WORD, LIST
0731 0215 LIST, 215
0732 0212 212
0733 0324 324 /T
0734 0311 311 /I
0735 0314 314 /L
0736 0324 324 /T
0737 0240 240
0740 0243 243 /#
0741 0000 0

```

```

/
/
/
*7441
/PUT DISPLAY SECT. OVER MONITOR
7441 0000 MOVE, 0 /AC=0
/
/
7442 6615 DEAL /SET XTENDED REGISTERS
/SD MINI-BOOTSTRAP WILL WORK
/
/
7443 1361 TAD P5377 /FOSL CLOBBERS *7577;
7444 3377 DCA LOC+1 /FIX IT UP...
7445 1757 TAD I PROG
7446 3760 DCA I TOP
7447 2357 ISZ PROG
7450 2360 ISZ TOP
7451 2260 ISZ CNT
7452 5245 JMP --5
7453 7001 IAC /THEN RESTORE IT
7454 3377 DCA LOC+1
7455 1346 TAD DATA-2 /FIX UP *7600
7456 3673 DCA I DISPX-1
/
7457 5641 JMP I MOVE
7460 7661 CNT, START-7600
/
/
/

```



7461	0000	START,	0	/AC=0
7462	1750		TAD I DATA	/USE D.B. REGISTER AS POINTER-
7463	3365		DCA DX	/(IX,IY) FROM FORTRAN
7464	1772		TAD I YORIG	
7465	3366		DCA DY	
7466	1362	GRID,	TAD XSET	/THIS PART DRAWS XY GRID
7467	3367		DCA COUNT	
7470	3370		DCA ID	
7471	1366		TAD DY	
7472	6063		DYL	/SET Y BUFFER FOR X AXIS
7473	7600		CLA+400	/GROUP 2 CLA
7474	1370	DISPX,	TAD ID	
7475	6057		DXS	
7476	1371		TAD ADD	
7477	3370		DCA ID	
7500	2367		ISZ COUNT	/X AXIS DONE?
7501	5274		JMP DISPX	
7502	1363		TAD YSET	
7503	3367		DCA COUNT	
7504	3370		DCA ID	
7505	1365		TAD DX	
7506	6053		DXL	/SET X BUFFER FOR Y AXIS
7507	7200		CLA	
7510	1370	DISPY,	TAD ID	
7511	6067		DYS	
7512	1371		TAD ADD	
7513	3370		DCA ID	
7514	2367		ISZ COUNT	/Y AXIS DONE?
7515	5310		JMP DISPY	
/				
7516	1773		TAD I NP	
7517	7041		CIA	
7520	3367		DCA COUNT	
7521	1374		TAD ADRESX	/DISPLAY (NX,NY) PAIRS
7522	3365		DCA DX	/FROM FORTRAN
7523	1375		TAD ADRESY	
7524	3366		DCA DY	
7525	1765	LOOP,	TAD I DX	
7526	6053		DXL	
7527	7200		CLA	
7530	1766		TAD I DY	
7531	6067		DYS	
7532	7200		CLA	
7533	2365		ISZ DX	
7534	2366		ISZ DY	
7535	2367		ISZ COUNT	/END OF GRAPH?
7536	5325		JMP LOOP	
/				
7537	6031	FLGCHK,	KSF	/FLAG UP?
7540	5262		JMP START+1	/NO - DISPLAY AGAIN
7541	6036		KRB	/YES - READ ITY BUFFER
7542	3370		DCA ID	
7543	1370		TAD ID	
7544	1372		TAD YORIG	/CTRL/C? (7575=-203)
7545	7650		SNA CLA	
7546	5376		JMP LOC	/GET MONITOR WITH MINI-BOOTSTRAP
7547	5352		JMP +3	/LEAVE ROOM FOR DATA BREAK REGISTERS
/				
7550	7576	DATA,	7576	
7551	7576	BREAK,	7576	

7552	1370	TAD	ID	
7553	1364	TAD	MCTRLP	/CTRL/P?
7554	7650	SNA	CLA	
7555	5661	JMP	I START	/YES-RETURN TO FORTRAN
7556	5262	JMP	START+1	/NO-DISPLAY AGAIN

```

/
7557 7461 PRD6,  START
7560 7661 TJP,  START+200
7561 5377 P5377, 5377
7562 7633 XSET,  -145
7563 7657 YSET,  -121
7564 7560 MCTRLP, -220
7565 0000 DX,    0
7566 0000 DY,    0
7567 0000 COUNT, 0
7570 0000 ID,    0
7571 0012 ADD,   12
7572 7575 YDRIG, 7575
7573 7574 NP,    7574
7574 0000 ADRESX, 0
7575 0000 ADRESY, 0

```

```

7576 6603 LOC,   6603

```

```

/--NOTE!!!---LOC'N 200 OF DISK
/MUST BE 3200!!!!!!

```

```

/
DXI=6053
DXS=6057
DYL=6063
DYS=6067
DEAL=6615

```