



MEMORANDUM

TO T Distribution
FROM David S. Escoffery

DATE February 3, 1969

SUBJECT: BTM Demonstration Programs

REFERENCE APD-9-111

There are four demonstration programs which are resident files on the data center's SIGMA 7 BTM system. These programs are source files of BASIC, FORTRAN, and SYMBOL jobs which were incorporated into the BTM exhibit at the recent Fall Joint Computer Conference in San Francisco. We are making them available to S.D.S. personnel to aid in demonstrations of the Sigma 5/7 Batch Time-Sharing Monitor.

The files are read-only files located in the PDF (Permanent Demonstration Files) account under the following names:

@DEMO1
@DEMO1A
@DEMO2
@DEMO3
@DEMO4

To acquire the images, perform the following operations under your own account:

```
!FERRET  
>COPY @DEMO1 (PDF),DEMON  
>COPY @DEMO1A (PDF),FINAL  
>COPY @DEMO2 (PDF),FORT  
>COPY @DEMO3 (PDF),SYM  
>COPY @DEMO4 (PDF),CONTROL  
>X
```

File @DEMO1 contains a BASIC program which demonstrates the following features of the language:

- PRINT, PRINTUSING, and Image statements
- Intrinsic functions
- Alphanumeric constants
- Serial assignment of variables within one statement
- Console input statements
- Computed GOTO statement
- CHAIN statement

Subroutine linkage (GOSUB/RETURN)
REM statements for comments and/or spacing
DIM statements imbedded in executable code
Matrix input, print, copy, inversion, and multiplication statements
User-defined functions
FOR/NEXT loop (variable used only as counter, not as subscript)

File @DEMO1A is a companion to the above program. It is used to demonstrate BASIC chaining. It must be given the name FINAL when copied from the PDF account.

File @DEMO2 contains a FORTRAN IV-H program demonstrating the following features:

IMPLICIT INTEGER
Double Precision Complex Nos.
LOGICAL statements
NAMELIST functions
DATA statements
FORTRAN II compatibility
Tabs
In-line Symbol coding

File @DEMO3 contains a BTM-SYMBOL program outputting a text message to the console.

File @DEMO4 contains the control cards necessary to run the FORTRAN demonstration in the background. The job card must be changed to reflect your name and account.

S.D.S. personnel who have demonstration programs which they desire to be maintained permanently in PDF (e.g. a COBOL job) should submit the sources (paper tape, cards, or a file image) to this office with sufficient documentation. Such examples will be appreciated.


David S. Escoffery

DSE/db

IBASIC

>
>LOAD FINAL
>LIST

```
100 REM --- THIS IS THE ROUTINE CALLED 'FINAL'  
200 PRINT 'BECAUSE YOU TYPED ' A0 ', I AM QUITTING'  
300 PRINT 'BYE FOR NOW!'  
99999END
```

} @DEMO1A

>
>CLEAR
>LOAD DEMON
>LIST

LISTING OF @DEMO1

```
100 PRINT  
110 PRINT USING 120, DAY(0), YER(0), TIM(0)  
120 :THIS IS A DEMONSTRATION OF BASIC ON #####/#### AT #####  
130 A0 = 'ZERO', A1 = 'ONE', A2 = 'TWO'  
140 PRINT  
150 PRINT 'TYPE 0 TO QUIT, 1 FOR MATRIX EXAMPLE, 2 FOR FUNCTION EXAMPLE'  
160 INPUT Z1  
170 PRINT 'YOU TYPED IN';  
180 ON Z1 GOTO 200, 230  
185 PRINT A0 ' SO WE GO TO THE FINAL ROUTINE'  
190 CHAIN 'FINAL'  
200 PRINT A1 ' SO WE GO TO THE MATRIX EXAMPLE'  
210 GOSUB 270  
220 GOTO 140  
230 PRINT A2 ' SO WE GO TO THE FUNCTION EXAMPLE'  
240 GOSUB 470  
250 GOTO 140  
260 REM --- THIS IS THE MATRIX EXAMPLE  
270 DIM X(3,3), Y(3,3), Z(3,3)  
280 PRINT  
290 PRINT 'TYPE IN A 3X3 MATRIX BY ROWS'  
300 MAT INPUT X  
310 PRINT  
330 PRINT 'THIS IS YOUR MATRIX AS TYPED'  
350 MAT PRINT X  
370 MAT Y = X  
380 MAT Z = INV(X,D)  
385 MAT X = Y * Z  
390 PRINT  
400 PRINT 'THIS IS ITS INVERSE'  
410 MAT PRINT Z  
415 PRINT  
420 PRINT 'THIS IS THE PRODUCT OF THE ORIGINAL AND THE INVERSE'  
425 MAT PRINT X  
430 PRINT  
440 PRINT 'ITS DETERMINANT IS EQUAL TO' D  
450 RETURN  
460 REM --- THIS IS THE FUNCTION EXAMPLE  
470 DEF FNZ(R, S, T) = SQR( MAX (R,S,T) )  
475 FOR K = 1 TO 2  
480 PRINT  
485 PRINT 'TYPE IN 3 INTEGERS OF 6 OR FEWER DIGITS EACH'  
490 INPUT Q, P, Q  
500 PRINT USING 510, FNZ(Q, P, Q)  
510 :THE SQUARE ROOT OF THE LARGEST IS ###.###.  
515 NEXT K  
520 RETURN  
540 END
```

->RUN
10:48 01/10

EXECUTION OF @DEM01

THIS IS A DEMONSTRATION OF BASIC ON 01/10/1969 AT 10:48

TYPE 0 TO QUIT, 1 FOR MATRIX EXAMPLE, 2 FOR FUNCTION EXAMPLE
?2

YOU TYPED IN TWO SO WE GO TO THE FUNCTION EXAMPLE

TYPE IN 3 INTEGERS OF 6 OR FEWER DIGITS EACH

?152,153,999999

THE SQUARE ROOT OF THE LARGEST IS 999.999

TYPE IN 3 INTEGERS OF 6 OR FEWER DIGITS EACH

?325,179,33

THE SQUARE ROOT OF THE LARGEST IS 18.028

TYPE 0 TO QUIT, 1 FOR MATRIX EXAMPLE, 2 FOR FUNCTION EXAMPLE

?1

YOU TYPED IN ONE SO WE GO TO THE MATRIX EXAMPLE

TYPE IN A 3X3 MATRIX BY ROWS

?111,222,568

?731,555,898

?150,29,711

THIS IS YOUR MATRIX AS TYPED

111	222	568
731	555	898
150	29	711

THIS IS ITS INVERSE

-4.61780E-03	1.77125E-03	1.45193E-03
4.82425E-03	7.86708E-05	-3.95334E-03
7.77449E-04	-3.76891E-04	1.26140E-03

THIS IS THE PRODUCT OF THE ORIGINAL AND THE INVERSE

1	0	2.22045E-16
7.07767E-16	1.00000	6.66134E-16
0	0	1

ITS DETERMINANT IS EQUAL TO -7.98136E+07

TYPE 0 TO QUIT, 1 FOR MATRIX EXAMPLE, 2 FOR FUNCTION EXAMPLE
?0

YOU TYPED IN ZERO SO WE GO TO THE FINAL ROUTINE

BECAUSE YOU TYPED ZERO, I AM QUITTING
BYE FOR NOW!

99999 HALT

>

FORTRAN IV-H DEMONSTRATION (@DEMO2)

!ASSIGN M:SI,(FILE,FORT)

!ASSIGN M:BO,(FILE,BIN)

!FORTRAN

OPTIONS: LS,BO,S

- 1: C SPECIFY OPTIONS LS,BO,S...ASSIGN F:10 TO TERMINAL
- 2: IMPLICIT INTEGER(B)
- 3: COMPLEX CMP*16
- 4: LOGICAL LOG,T,F
- 5: NAMELIST /DEMO/BIGGER,CMP,LOG
- 6: DATA CMP,T,F/(1.6,3.2D0),.TRUE.,.FALSE./,
- 7: X BIG/213744300/
- 8: PRINT 14
- 9: 14. FORMAT (T21,'SDS BTM DEMONSTRATION',T1,
- 10: X'OUTPUT FROM',T45,'FIRST QUARTER 1969')
- 11: IF (BIG.GT.6)LOG=.NOT.(F.OR..NOT.T)
- 12: S LW,3 BIG
- 13: S AI,3 2
- 14: S STW,3 BIGGER
- 15: WRITE (10,DEMO)
- 16: STOP
- 17: END

SUBPROGRAMS

BF:PIN	BF:S9	BF:SF	BF:S7	BF:SX
PROGRAM ALLOCATION				
48.0	BIGGER	4A.0	CMP	4E.0 LOG 4F.0 T
50.0	F	51.0	BIG	
PROGRAM SIZE 52				
PROGRAM END				

!LOAD

ELEMENT FILES: BIN

OPTIONS:

SREF BF:DINI2
 SREF BF:GTRCD
 SREF BF:DATA3
 SREF BF:QHFQR
 SREF BF:GTCAR

F:10

F:

SEV.LEV. = 0

XEQ?

OUTPUT FROM SDS BTM DEMONSTRATION FIRST QUARTER 1969

&DEMO

BIGGER=213744302,CMP=(1.6000000000000000 ,3.2000000000000000),LOG=T,

&END

STOP

USER EXIT.

!

BTM-SYMBOL EXAMPLE (@ DEMOS)

!ASSIGN M:SI,(FILE,SYM)

!SYMBOL

OPTIONS:

	SYSTEM	SIG5		
1				0001.000
START	LI,1	16		
2	00000	22100010	A	0002.000
	LI,2	0		
3	00001	22200000	A	0003.000
LØØP	LB,0	ØUTPUT,2		
4	00002	72040000	F	0004.000
	CAL3,1	0		
5	00003	06100000	A	0005.000
	AI,2	1		
6	00004	20200001	A	0006.000
	BØR,1	LØØP		
7	00005	64100002		0007.000
	CAL3,6	0		
8	00006	06600000	A	0008.000
ØUTPUT	TEXT	':SYMBOL ØUTPUT:.'		
9	00007	7AE2E8D4	A	0009.000
	00008	C2D6D340	A	
	00009	D6E4E3D7	A	
	0000A	E4E37A7A	A	
	END	START		
10	00000			0010.000
SYMBOL DICTIONARY				
LØØP	00002		4*	7
ØUTPUT	00007		4	9*
START	00000		2*	10
\$	0000B			
\$\$	0000B			

** END ØF ASSEMBLY **

!LOAD

ELEMENT FILES:

OPTIONS: M

UDEF C200 0 LOWEST LØC

UDEF C20C 0 HIGHEST LØC

DEF C7D0 0 M:DØ

F:

SEV.LEV. = 0

XEQ?

:SYMBOL ØUTPUT:.

USER EXIT.

!

INSERTING @DEMO2 IN BACKGROUND
JOB STACK (@DEMO4)

! ASSIGN M:SI,(FILE,CONTROL)

!BPM

INSERT JOB? Y

DISPLAY FOR EDIT? Y

1

!JOB 6431,MKTG,F

2

! ASSIGN M:SI,(FILE,@DEMO2,PDF),(SAVE)

3

! ASSIGN M:BO,(FILE,BINARY)

4

! ASSIGN M:LO,(FILE,LOFILE)

5

! ASSIGN M:LL,(FILE,LLFILE)

6

! ASSIGN F:IO,(FILE,OUTPUT)

7

!FORTRANH SI,LO,BO,S

8

!LOPE (EF,(BINARY)),(EXEC)

EDIT? N

JOB INSERTED. ID=0008

STATUS CHECK? Y

ID=B

WAITING.

ID=B

RUNNING.

ID=B

COMPLETED.

ID=

!FERRET

>LIST BTM

BINARY

LLFILE

LOFILE

OUTPUT

>EXAMINE OUTPUT(BTM)

#N

3

#

&DEMO3

BIGGER=213744302,CMP=(1.6000000000000000,3.2000000000000000),LJG=T,

&END

#X

(@DEMO4 CONT)

>EXAMINE LOGFILE(BTM)

#54,68

11

IF (BIG.GT.6)LOG=.NOT.(F.OR..NOT.T)
0011000

BIG	1E	32300000		LW,3
2INTC	1F	31300000		OW,3
3S	20	68200000		BLE
T	21	32300000	4G	LW,3
5S	22	68300000		BE
F	23	32300000		LW,3
5G	24	69300000		BNE
-1	25	223FFFFF		LI,3
6G	26	68000000		B
0	27	22300000	5G	LI,3
LOG	28	35300000	6G	STW,3
0			3G	RES

#X

>TEST OUTPUT(BTM)

OUTPUT WAS CREATED 01,14,'69 AND HAS 2 GRANULES IN IT.

>X

!BYE

01/14/'69 09:51