



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.

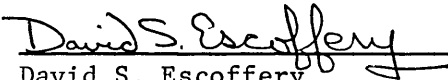
File @DEMO2 contains a FORTRAN IV-H program demonstrating the following features:

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

!BASIC

>

>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 = 'ZERØ', A1 = 'ØNE', A2 = 'TWØ'
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 Ø, P, Q
500 PRINT USING 510, FNZ(Ø, 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-14 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 RTM 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:GHEOR
SREF BF:GTCAR

```

F:10

F:

SEV.LEV. = 0

XEQ?

OUTPUT FROM SDS RTM 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
LOOP	LB,0	OUTPUT,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
	BDR,1	LOOP		
	7	00005	64100002	0007.000
	CAL3,6	0		
	8	00006	06600000 A	0008.000
OUTPUT	TEXT	':SYMBOL OUTPUT:.'		
	9	00007	7AE2E8D4 A	0009.000
		00008	C2D6D340 A	
		00009	D6E4E3D7 A	
		0000A	E4E37A7A A	
	END	START		
	10	00000		0010.000
	SYMBOL DICTIONARY			
	LOOP	00002	4*	7
	OUTPUT	00007	4	9*
	START	00000	2*	10
	\$	0000B		
	\$\$	0000B		

** END OF ASSEMBLY **

!LOAD

ELEMENT FILES:

OPTIONS: M

UDEF C200 0 LOWEST LOC

UDEF C20C 0 HIGHEST LOC

DEF C7D0 0 M:D0

F:

SEV.LEV. = 0

XE0?

:SYMBOL OUTPUT:.

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

#

&DEMO

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

&END

#X

(@DEMO4 CONT)

>EXAMINE LOGFILE(BTM)

#54,68

11

IF (BIG.GT.5)LOG=.NOT.(F.OR..NOT.T)
0011000

	1E	32300000		LW,3
BIG	1F	31300000		GW,3
2INTC	20	63200000		BLE
3G	21	32300000	4G	LW,3
T	22	63300000		BE
5G	23	32300000		LW,3
F	24	69300000		BNE
5G	25	223FFFFF		LI,3
-1	26	63000000		B
6G	27	22300000	5G	LI,3
0	23	35300000	6G	STM,3
LOG			3G	RES
0				

#X

>TEST OUTPUT(BTM)

OUTPUT WAS CREATED 01.14.'69 AND HAS 2 GRANULES IN IT.

>X

!BYE

01/14/'69 09:51