

516-58
HL
1/13/72

CALLING PROCEDURES FOR MATH ROUTINES

The MATH routines do not use any of the user .T's or .RP's and only use the system .TST's where absolutely necessary so as to facilitate interfacing with any user program. The same routines are used both by the DESK calculator and the FSNAP language.

In general an argument is passed to a routine via the A and B registers with the A register containing the high order word. A second argument is passed via an address pointer following the CALL statement, pointing to the high order word of the double word argument. The argument may be either in the same segment as the CALL statement or in sector 0 of core memory. An argument is passed from a routine via the A and B registers with the A register containing the high order word of the double word argument.

(1) Input floating point number

RCALL	FLPIN	wait for input
JMP	ERRØR	error exit
		input in A,B

Either a space or a carriage return serves as the action character.

(2) Output floating point number

RCALL FLPOUT output number passed in A,B
Format is specified by .T13 in which left byte indicates
total number of digits and right byte indicates number of
digits after the decimal point. A register contains a - 1
if interrupt has been hit.

(3) Addition of two numbers

e.g. CALL FADD add two F.P.
ADDR ARG2 numbers
JMP ERRØR error return
sum in A,B

ARG2 : ØCT 40500,0

(4) Subtraction of two numbers

CALL FSUB
ADDR SUBTRA
JMP ERRØR difference in A,B

(5) Multiplication of two numbers

CALL FMULT
ADDR MLTPCD
AMP ERRØR product in A,B

(6) Division of dividend by divisor

CALL FDIVD
ADDR DIVSR
JMP ERRØR quotient in A,B

(7) Raising a base to a power

BASE in A,B

CALL FPØW

ADDR POWER

JMP ERRØR

error return

BASE ↑ POWER in A,B

(8) Square root

CALL FSQRT

JMP ERRØR

(9) Sine of angle (in radians)

CALL SINE

JMP ERRØR

(10) Cosine of angle (in radians)

CALL CØSINE

JMP ERRØR

(11) Tangent of angle (in radians)

CALL TANGNT

JMP ERRØR

(12) Cotangent of angle (in radians)

CALL TANGNT,1

JMP ERRØR

(13) Arctangent function

CALL ATAN

JMP ERRØR

(14) Exponential function

CALL EXP

JMP ERRØR

(15) Logarithm, base e

CALL ALØG

JMP ERRØR

(16) Logarithm, base 10

CALL ALOG,1

JMP ERRØR

(17) Integer part of number

CALL FSNPIP

JMP ERRØR

(18) Random number generator

CALL RANDØM

JMP ERRØR

input a fraction $0 < x < 1$ but not $x = 2^{-N}$

output a random fraction $0 < x < 1$

(19) Convert number to double precision integer

CALL DINTGR

JMP ERRØR

double precision integer is contained in A,B registers
with lower 15 bits of B containing least significant
part and lower 15 bits of A containing most significant
part if number is positive.

(20) Convert single precision integer to floating point

CALL FL~~O~~AT enter with integer in A, exit
with F.P. number in A,B