

VAX Floating Point

- * 4 formats, all with hidden bit**

- F 1, 8, 23+1**

- D 1, 8, 55+1**

- G 1, 11, 52+1**

- H 1, 15, 112+1**

- * Accuracy**

- * All operations are 0.5 ulp accurate, but no round to even**

- * Round to nearest always used, no rounding modes**

- * Special operands**

- * No Infinity, NaN, denorms**

- * -0 is a reserved operand**

- * Exceptions**

- * Overflow produces reserved operand and always takes a floating overflow trap**

- * Divide by zero produces reserved operand and always takes a floating divide by zero trap**

- * Underflow always produces zero and takes a floating underflow trap if it is enabled**

- Underflow traps are disable on every procedure call**

- * Reserved operand (-0) aborts instruction and always takes reserved operand trap**

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VMS Exception handling -- General

- * Machine faults are translated into software signals with specific condition numbers**
 - * Programs can establish signal handlers on a per-procedure basis which are passed the condition number**
 - * Handlers can pass the condition, unwind, or continue**
 - * If program does not handle condition the a default handler prints something like**
 - %SYSTEM-F-FLTOVF_F, arithmetic fault, floating overflow**
at PC=00000711, PSL=03C0
 - %TRACE-F-TRACEBACK, symbolic stack dump follows**

module name	routine name	line
TEST	TEST	30
- and then stops**

VMS Exception handling -- Floating point

1 / 0	-0		%SYSTEM-F-FLTDIV_F
0 / 0	-0		%SYSTEM-F-FLTDIV_F
Overflow	-0		%SYSTEM-F-FLTOVF_F
Underflow	0		%SYSTEM-F-FLTUND_F (if enabled)
Bad input	0		%FOR-F-INPCONERR
sqrt(-1)	-0		%MTH-F-SQUROONEG, square root of negative value
sqrt(-0)		none	%SYSTEM-F-ROPRAND
log(0)	-0		%MTH-F-LOGZERNEG, logarithm of zero or negative value
log(-1)	-0		%MTH-F-LOGZERNEG
log(-0)	-0		%MTH-F-LOGZERNEG
exp(89)	-0		%MTH-F-FLOOVEMAT, floating overflow in math library
exp(-89)	0		
exp(-0)	1.0		
sin(1e38)	0.989164472		
atan(0,0)		none	%MTH-F-INVARGMAT
0**0	-0		