

**digital**

## INTEROFFICE MEMORANDUM

SUBJECT: PDP-11 Floating Point  
Format

DATE: October 1, 1970

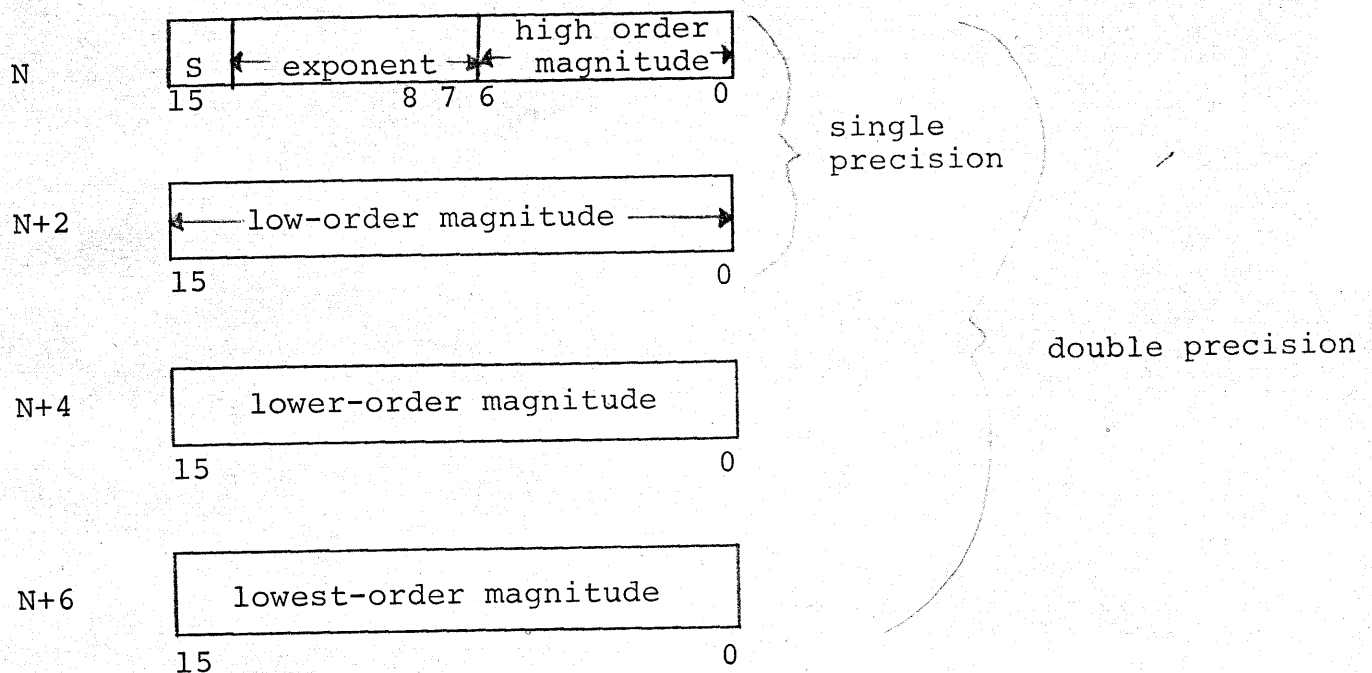
TO: PDP-11 List C  
PDP-11 Master List

FROM: Hank Spencer

DEPARTMENT: Programming

Yesterday's meeting on this subject agreed to accept the floating point format shown below as appropriate for the entire PDP-11 line. Possible alternatives, the rationale for choosing this one, and its shortcomings are covered in detail in PDP-11/40 Technical Memorandum #16. This format will be implemented in software in the PDP-11/20, as a floating point package used in the Fortran Object Time System, and in hardware in the PDP-11/40.

The format:



S = sign of fractional portion

Magnitude = size of fraction, unsigned

exponent = binary exponent, excess  $128_{10}$ } sign-magnitude  
form, binary  
normalization

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Because we limit ourselves to normalized numbers, the highest order bit of the fraction magnitude is always 1, therefore, it is not represented in this format. Thus the single precision form has effectively 24 bits of precision, the double-precision form has 56 bits.