

November 17, 1959

MEMORANDUM TO: 1401 File

SUBJECT: Varying the Quotient, Dividend or Divisor
Fields in EA Option.

When deviating from the rules governing the assignment of fields for divide operations, (i.e., the dividend and quotient fields should have equal lengths and the divisor field should be equal to or less than the dividend field), it is possible to generate partial, larger or incorrect quotients as shown below. Memory locations outside of the assigned divide fields will not be affected under such conditions.

The respective fields will be designated as follows to simplify the explanation.

- L_D = Length of the dividend field
- L_DV = Length of the divisor field
- L_Q = Length of the quotient field

1. $L_D < L_Q < L_DV$

A partial quotient of the high order digits only will be developed and the number of digits developed will be dependent on the difference in the lengths of the quotient and dividend fields. An incorrect remainder will be left in the dividend field.

2. $L_Q < L_D \leq L_DV$

If the quotient field is equal to or greater than the number of significant digit positions in the divisor, (but less than the length of the dividend field), the quotient and remainder developed will be the same as in (1).

The Divide-Overflow latch is turned on and a I/O change is initiated if the quotient field is shorter than the number of significant digit positions in the divisor.

3. $L_D \leq L_DV < L_Q$

The quotient generated will include decimal positions (all 0's) equal to the difference in the lengths of the dividend and quotient fields. The correct remainder associated with the lowest order significant digit in the quotient will be left in the dividend field.

4. $L_D < L_N \leq L_Q$

The Divide-Overflow Latch is turned on and a I/E change is initiated if the length of the Divisor field exceeds the length of the dividend field.

Should a programmer have need to deviate from the rules given for divide, it is understood that he will be responsible for keeping track of the decimal point.

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