HARVEST REPORT #7

Subject: Parallel Accumulating Mechanism and Associated Counter

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Date: January 3, 1957

1/3/57

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There are certain situations in which counting in memory needs to be supplemented by the accumulation of sums and/or differences in an accumulator. For example, it is often necessary to make a statistical evaluation of a frequency count at regular intervals during the counting process and to compare the result with one or more threshold values. For this and similar applications there will be a special accumulator and an associated counter whose count always represents the number of entries made to the accumulator. The accumulation and counting will take place as parallel operations in not more than 0.2 microsecond.

Since some of the required applications may involve total counts exceeding 10,000 characters, the counter will be capable of counting ones up to a total of $2^{16} - 1 = 65,535$.

The accumulator will be able to accept values up to 8 (or possibly 16) bits either from memory or from a continuous stream register and will be able to accumulate totals up to 24 bits. Both addition and subtraction will be possible and, whenever negative totals occur, they will appear in sign-and-absolute-value notation. It will be possible, subject to the programmer's wishes to control the accumulator in such a way that it will not retain negative totals, but will reset itself to zero whenever such a total occurs.

The source of a quantity to be accumulated will be either a continuous stream register or a portion of a word in memory. A suitable switching mechanism will transfer the bits in question to the accumulator.

It will be possible to compare the contents of the accumulator with a threshold value. The comparison can be done at suitable intervals under control of the program. Whenever a comparison shows that the total in the accumulator equals or exceeds the threshold value, an appropriate indication will be given.

The contents of the counter and the accumulator will be available to the program.

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