

To D. Liddle Date October 26, 1977
From H. C. Lauer Location Palo Alto
Subject Time-of-Day facilities for D0 Organization SDD/SD

XEROX

XEROX SDD ARCHIVES

I have read and understood

Pages _____ To _____

Reviewer _____ Date _____

of Pages _____ Ref. 77SDD-371

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In discussions with Brian Rosen, I have been told that it is possible and relatively easy to include a reliable, battery-powered, Time-and-Date clock in the D0 at low cost. This consists of a digital watch chip mounted on the processor board. Such clocks typically report the time (and date?) with a precision of one second and an accuracy of a few seconds per month.

I propose that we take formal steps to have such a clock included in the D0 for the following reasons:

1. The need to know the time of day is pervasive throughout the operating system and applications. In dozens of cases, documents, files, printed copies, and the display will be stamped with the time and date of important events in their lives. Either we have a time of day clock readily available, or we simulate one using other, less satisfactory timing facilities.
2. If the time and date are not available internally (or from a server on the Xerox Wire), then the customer will be burdened with the nuisance of having to enter it each time he turns on the power to his system element. This is a small but perceptible inconvenience which our competitors could exploit.
3. A human-supplied time and date can be (and usually is) wildly inaccurate. This may affect the design of applications, and it certainly imposes a requirement that they be very robust against such inaccuracy. In particular, values reported by the timing software on a system element would not be guaranteed to be "ordered in time" across a power-down. (For example, it would not be safe to assume that one version of a document predates another because it has an earlier time stamp from the same system element -- particularly if the difference were, say, 364 days.)
4. Software time-and-date clocks which operate from an initial setting and an interval timer are always messy to program. I suspect that the design costs of such software are of the same order of magnitude as the design cost of including a watch chip and microprogramming it.
5. A battery-powered watch chip (if it is really as cheap and available as alleged) is almost certain to be cheaper than some mechanism which uses wall-socket power to drive an internal clock across power-off periods of the system element. It is also immune to pulling the plug, an event which happens regularly in any office environment.
6. The cost of such a chip is, I am told, so ludicrously low that we could not really afford to be without it!

c: W. Shultz
W. Lynch
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