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m e m o r a n d u m

To: Architecture Committee List Date: 28 Mar 83
From: Mike Uhler
CC: Dave Braithwaite Dept: L.S.E.G.
 Ulf Fagerquist DTN: (8-)231-6448
 Peter Hurley Loc/Mail stop: MR01-2/E85
 Vern Poulter Net mail: UHLER at 10
 Jack Rosen

Subject: Functional changes to the PDP-10 architecture

During the past few years, we have been rather lax in clearly documenting changes to the PDP-10 architecture. In some instances, this was due to the lack of acceptable minutes taken at Architecture Committee meetings. In others, we made changes to the architecture based on ambiguous or incomplete specifications. There are probably other reasons and we can debate them endlessly.

We are about to begin the hardware design phase of the Jupiter II CPU which has aggressive performance goals. In order to meet both the performance goals and the requirement that the design be functionally correct, we must reevaluate our policy on making changes to the architecture if such changes are to be included in the Jupiter II design.

The initial functional description of the machine will be taken from the following sources:

- o Processor Reference Manual (AA-H391A-TK with June 1982 update AD-H391A-T1 installed).
- o KC10 version 8 (March 29, 1983).

My memo on Extended Addressing has been included as a chapter in KC10 and the description of extended addressing described in that chapter is part of the functional description of the machine.

Other requests for functional changes or corrections to the listed documentation which you wish to have included in the Jupiter II implementation of the architecture must be received by me no later than 17:00, Friday, 29-Apr-83. To be considered, a proposed change must have been reviewed and approved at a meeting of the PDP-10 Architecture Committee. In addition, a complete functional specification of the proposed change, including normal and

exception handling must be included. To avoid later problems of second-guessing why a change was made, I suggest that the change also include minutes of the discussion of the change.

As in the past, we will consider adding changes received after this date to the machine on a case-by-case basis.

It should be pointed out that some performance goals will probably require extensive hardware support. Because hardware is more difficult to change than microcode, the cost of making repeated changes to the architecture later on may be quite high.