XEROX

BUSINESS SYSTEMS
System Development Department

To: H. Scharmann

From: W. C. Lynch

Subject: Computer Mag Tape Controller

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Location: Palo Alto

Organization: SDD/SD/SSW/Pilot

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Copies: Archives   Belleville   Metcalfe   Jarvis   Snow   Lynch

Enclosed is a marked-up copy of the mag tape controller req spec. The red marks are Metcalfe's and the blue ones are mine. Bob's comments are restricted to asking that the device be refered to as the Computer Magnetic Tape Controller (abreviated CMTC).

My comments require more explaination.

I believe that the allowable gap sizes and their meaning need to be carefully specified. I presume, but do not know, that reference (3) in section 3.0 specifies this. If so, the relevent numbers should be copied into the req spec. I do know that recovering from unusual tape errors associated with short blank spaces on the tape is tricky, difficult, and occasionally impossible. Section 5.5 appropriately emphasizes this point.

It should be made much clearer that the firmware is an integral part of the controller and is to be designed concurrently with the controller rather than afterward by the same or a different party. This has implications in a number of places. For example, I don't think an intelligent design as described in 5.2 can be arrived at without considerable detailed design of the firmware. Otherwise only a guess can be made as to whether the constraints of section 6.4 can be met.

In section 5.3, (5) Read Data, I don't believe that all of the length mismatch cases are described in detail. The document does say what to do if the memory buffer is shorter than the tape block length (5.5 (5)). It is not explicit in the opposite length mismatch case. Again, the immediate document is not explicit about how big of a blank area constitutes an end of block gap. In the case of the data buffer bigger than the tape block, the spec does not say if or where the software can recover the number of bytes actually transfered.

The track-in-error info should be specified as one of the status items to be returned in the IOCB. I believe that we should specify that the command chaining for the tape drive in question should terminate when a serious error is detected (this will be tricky in the two drive case unless we stop both).

The spec should not imply that error recovery should be attempted in the firmware. The complexity of tape error recovery is likely to prohibit the correct treatment of all errors and firmware treatment of some errors will still necessitate a complex software error recovery system. It seems to me not even close to being worth the microcode space.

I believe that Pitts Jarvis should be asked to rewrite section 6.1.1, using, and constructing if necessary, the standard CSB, IOCB boilerplate, such as now exists in the *Pilot Design Specification*. These two thing should each have their own bullets. I do not believe that

6.1.1 is either complete or correct as it stands.

Bravo for section 6.4! However, I believe that the actual numbers should either be cleared through Dick Snow or left TBD with the current numbers retained in the document as our current thinking.

I think that this spec is a substantial improvement over our previous controller specs, particularly in that it begins to explicitly come to grips with the firmware design problems.