MEMORANDUM

27 APR 1987

TO: JOHN LOHMEYER, CHAIRMAN X3T9.2

FROM: BILL SPENCE, TEXAS INSTRUMENTS

SUBJECT: TAPE WRITE EOT SENSE KEY

Based on what I have learned from you and others of the origin of Sense Key D--
VOLUME OVERFLOW, based on established practice among our company and some of
our vendors, and based on the simple meaning of English words, it appears that
we may not have come out right in SCSI-2 when writing on tape to EOT. To cor-
rect and clarify the situation, I propose the following two corrective actions.

1.   PAR 9.1.4. WRITE COMMAND (p 9-8 of draft of 10/31/86): Paragraph just
       before IMPLEMENTORS NOTE, next-to-last sentence. Change "MEDIUM ERROR"
       to "VOLUME OVERFLOW".

2.   TABLE 7-6: Sense Key Descriptions (p 7-8 of draft of 10/31/86): Sense
       Key Dh. Replace "remains" with "may remain".

EFFECT OF PROPOSALS

The first proposal makes the tape write response at EOT be sense key D, VOL-
UME OVERFLOW, instead of sense key 3, MEDIUM ERROR, in the ninth paragraph
of the command, the same as it is in the seventh paragraph. (The two paragraphs
cover circumstances which differ in minor degree, but to the error reporting
and recovery protocols of the system this difference is of no significance.)
The second proposal allows for the exceptional case where the command may just
complete as the EOT indication of the medium is reached, with no buffered data.

DISCUSSION

The WRITE command case needs to be kept distinct from the READ command case.
Indefinitely repeated READ commands are accepted until check status results with
sense key 8 (BLANK CHECK) set, which occurs at EOD (end of data)--or, in most
1/2" reel-to-reel installations, until the system itself recognizes something
in the data stream (e.g., double filemarks) which signals EOD. If before an
EOD indication is returned, EOT is reached, it definitely is an error condition
existing in the medium being read. In such case, sense key 3, MEDIUM ERROR, is
not an inappropriate sense key, and no other sense key is close at all.

The WRITE case is quite different. In almost all implementations (every one
known to us) the early warning (EOM) is sensed in plenty of time for all buf-
fered data to be written to tape. (If this should fail, par. 7 of the WRITE
command clearly--and quite properly, it seems--says that sense key D, VOLUME
OVERFLOW, is to be returned. No problem.) In almost all cases, if writing con-
tinues until the drive will write no further (EOT condition), it is because the
system or the user himself continues issuing write commands in the face of the
warning that space is approaching an end. The error here could be a drive or
firmware error; it more likely is a software or user error; but the thing that
it is NOT is a medium error. In no way is it useful to report it as a medium
error, which is generally recognized as an error in the magnetic storage pro-
cess rather than a procedural error. But VOLUME OVERFLOW was born to deal with
having reached EOT and being unable to bring a write command to an orderly con-
clusion. The only problem that could arise is that a completely unbuffered
drive, if such still exists, would not qualify as having data remaining in its
buffer--hence the proposal to recognize that in an exceptional case there may
not be data in buffer despite being at EOT and unable to write further.