FUJIFILM

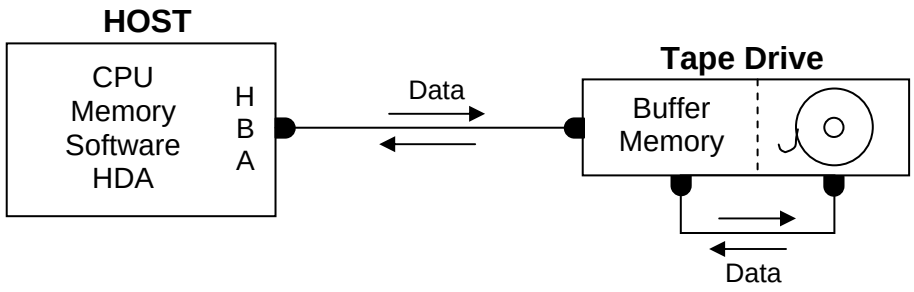
FLASH TECHNICAL SUPPORT

MAGNETIC MEDIA, OPTICAL DISCS AND OTHER DATA STORAGE PRODUCTS

Data Transfer Rate – Q & A

Question – My tape drive is writing much slower than the specified "sustained data transfer rate." What is causing these *tapes* to be so slow?

Answer – A drive can transfer data between the tape and its buffer memory (cache) only as long as cache is not empty when writing, or cache is not full when reading. If the host computer's transfer of data to, or from, the drive's cache is slower than the tape media can transfer, the cache will be periodically depleted while writing, or periodically filled when reading. In either case, the tape must stop transferring and reposition itself before transfer can begin again. The drive's repositioning time and any time waiting while stopped for the drive's buffer to be sufficiently filled by the host (when writing) or sufficiently emptied by the host (when reading) before the tape begins transferring again, will lengthen the overall time (slow throughput). The culprit in this case would be a slow host!



Today's drives are designed to operate in a streaming mode, not stop-start.

In normal operation, the drive should transfer data at a speed very close to its sustained transfer rate specification. If your drive is frequently repositioning (stopping, backing up and starting again), it is because the computer system is transferring data slower than the tape's transfer rate. Such shoeshine motions (not-streaming) can cause drive transports, read/write heads and tape media to experience abnormal wear. If you find this problem, it is important to identify and eliminate the computer system bottlenecks.

If your drive is constantly repositioning (stopping, backing up, starting again), it is *important* that the problem be resolved. You may want to turn off the drive's data compression, to slow down its effective transfer rate, when a host transfers too slowly for the drive. Check your block-size parameter; too small block-size may be causing the problem.

Find the cause for the host's slow transfer; consider that you may need to upgrade the host or choose a slower tape drive for that host.

Many host factors can affect data throughput (sustained data transfer rate), including the host computer memory/processor, disk drive data transfer rate, data block size, data characteristics/data compression ratio, host bus adapter/ SCSI bus capability/configuration, system software and application software. Data transferring over a slow network could be causing the target tape drive to experience slow throughput.

Some tape drive models have a feature to slow down the data transfer rate when the host's data transfer rate is too slow and cannot keep the drive streaming at its faster transfer rate. This tape drive feature can improve the drive's performance by dynamically adjusting the drive's data rate to try and match the data rate of a slower host. Slowing the drive to a slower host's rate helps avoid repositions.

If the drive is still not streaming and operates at less than 50% of the drive's slowest specified data transfer rate, find the cause for the host's slow transfer. You may need to upgrade the host or choose a slower tape drive for that host.

As you can see from the above, it is not the tapes that are causing the slow data transfer. There are other possibilities, such as a drive's severely worn read/write head at end-of-life that is causing so many errors that transfer has slowed due to overwhelming error correction (data rewrite or reread) activity. However, it is most likely that host issues are the cause, when a tape drive is not performing as well as expected.

Question – What is a tape pass or "head pass?"

Answer – A single pass of a particular area of tape over the drive's read/write head, under tension, in either forward or backward direction tape movement.

For example, a start/stop event moves tape forward over the heads, stops, reverses over the heads under tension control, stops, then moves forward again over the heads. This adds up to three passes for a portion of tape.

Question – Can I assume that I will get the advertised 2:1 compressed capacity and transfer rate for my data cartridges?

Answer – **No; you may get more or less.**

A more definitive statement that could be used for advertising capacity and transfer rate, which "assumes 2:1 data compression," would be:

"Assuming ***Your Data*** Compresses 2:1."

See *Tape Drive Data Compression Q & A* Technical Support Flash for more information about data compression.