$\frac{bt}{in} = \frac{bits/sec}{in/sec}$ 1.167

WANG LABORATORIES, INC.

MEMORANDUM

TO: John Cunningham
FROM: Harold Koplow/Bob Kolk
DATE: February 14, 1973
SUBJECT: 2200 Tape Drive Specifications

Format: Files or programs are automatically divided into a series of physical records. Each physical record contains 256 bytes of information. (Each physical record actually contains 512 bytes - each byte is redundantly recorded to insure data integrity.)

Method of Recording: Dual channel - complemented NRZI

Density: 800 bits/inch

Speed: 7 1/2 inches/second

Physical Record Size: 5.12 inches

Interrecord Gap: .6 inches

The above figures yield the following effective transfer, density rates - effective in the sense that these figures include start/stop times, interrecord gaps, and redundant recording.

Effective Density: ~~38.5~~ 522 program steps*/~~inch~~ ft 522/ft
~~70,000~~ 79,300 program steps*/150 ft. cassette

Effective Transfer Rate (Recording, Reading, or Searching): ~~340~~ 326 program steps*/second

* Each step is equivalent to one keystroke or one eight-bit byte of memory. Each floating point number occupies eight memory steps.

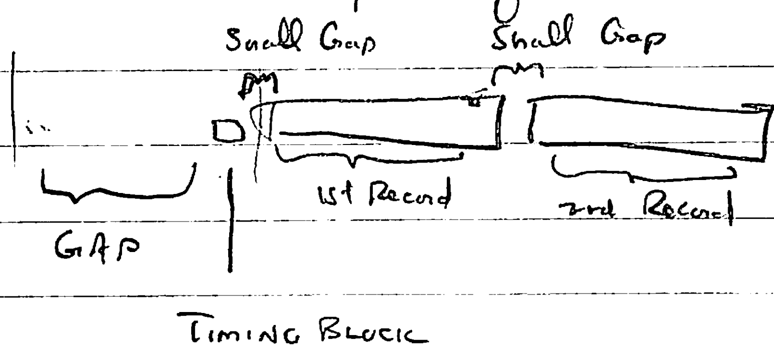
38.5
7.5
19.25
2695
287.7

HK/aw

cc: Dr. Wang

Effective Density

For each 256 bytes of Data:



GAP — .6"

Timing — 64 Bits / 800 Bits/inch = .08"

Small Gap — Negligible

1st Record — (256 bytes)(8 bits/byte) / 800 = 2.56"

2nd Record " " " = 2.56"

5.8"

∴ byte/inch = 256 / 5.8 = 44.137

bits = 529.6

= 322

B. Kolk

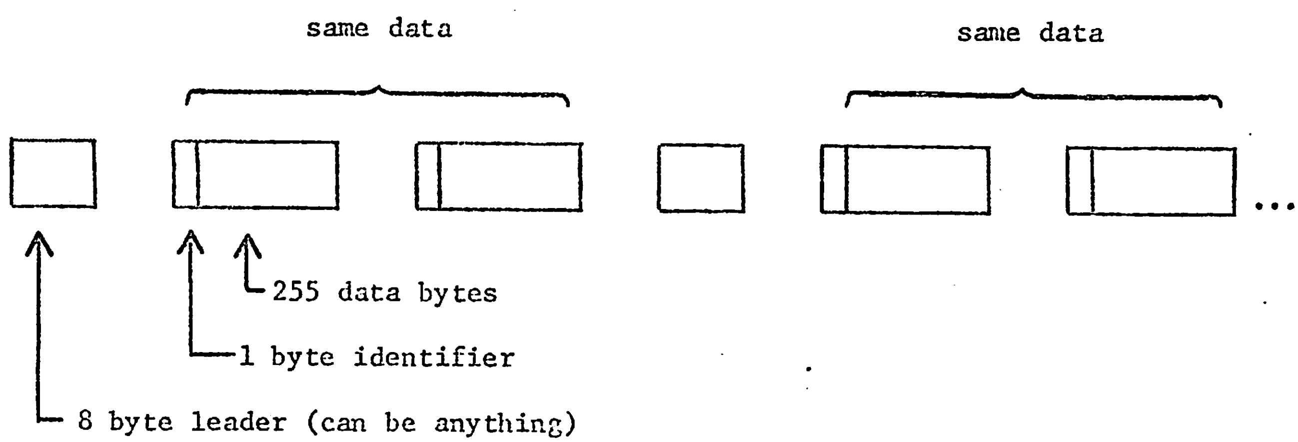
WANG LABORATORIES, INC.

MEMORANDUM

TO: Harold Koplow
FROM: John Patino-Bueno
DATE: August 14, 1973
SUBJECT: Preparing a Tape on a 709 or a 729 to be Read by a 2200B

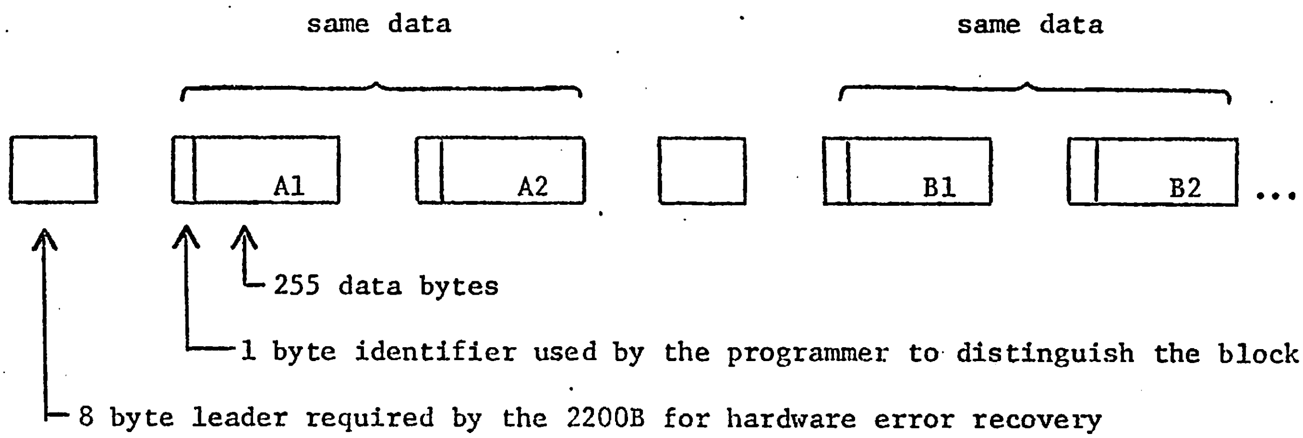
Actual appearance and way of preparing a tape on a 709/729

Each block must be 256 bytes long and must be double recorded. A byte in each block should be used to indicate which block is being read. Before each two blocks, an 8 byte leader has to be written - this 8 byte leader is not read into the 2200B and can be anything.



X Register: Memory address for transfer
Y Register: Block member
Command to write 8 bytes: 08 09
Command to write 256 bytes: 08 14

<u>Reading data recorded on a 729 or a 709 into the 2200B</u>



DATALOADBT instruction used to get the data into the 2200B. The DATALOADBT instruction requires that the 8 byte leader be present before each group of two 256-byte data blocks. The contents of the 8 byte leader is immaterial since it is never delivered to the user.

> Note: <u>The bits within the data bytes are reversed when read into the 2200B. For example, 05 03 (0101 0011) would be read as 1210 (1100 1010)</u>

The following are the conditions that may arise when reading a 709 or a 729 tape and the reasons for: the 8 byte leader, the double recording of blocks and the 1 byte identifier.

<u>All blocks are good</u>

If you just read the first block of a pair (A1) and ask to read the next block, the 2200B would give you the second block of the pair (A2) and not the first block of the next pair (B1) as might be expected. You must determine which block has been read by checking the byte identifier. For example, the low order of the byte might specify which of the two blocks has been read by making it zero for the first block and one for the second block.

<u>One block in a pair is bad</u>

If you ask the 2200B to read the first block of a pair (A1) and the 2200B finds this block bad, it would automatically read the second block of that pair (A2). The next block that would be read (if good) would be the first block of the next pair (B1).

If you have just read the first block of a pair (A1) and ask the 2200B to read the second block of that pair (A2) and this block is bad, the 2200B automatically reads the first block (if good) of the next pair (B1).

<u>Both blocks of a pair are bad</u>

If you request a read and both blocks are bad, the 2200B would go back to the nearest group of 8 bytes (leader) and tries reading the blocks. This is done five times - if at the fifth try the blocks cannot be read, a tape error indication is given. If the 2200B finds no leader the program is destroyed.

<u>Second block in a pair is bad, first block of the next pair is bad</u>

If you just read the first block of the first pair (A1) and ask to read the next block (A2), the 2200B would read the second block of the next pair (B2).

The 1 byte identifier should be used in such a way so as to cover the above possibilities. The high order may be used to determine which block pair you are at by making it zero for all even pairs of blocks and one for all odd pairs of blocks. This would cover the last possibility given.

Note: 609/629 tapes can also be read in a similar fashion.

JPB/dmp