



Legac-E Education

## **Inter-Block Gaps (IBGs)**

---

With current hardware technologies the relevance of Inter Block Gaps may seem unimportant especially from the Capacity Planning perspective, but the association with Performance and Throughput is still a real issue.

Inter Block Gaps are small portions of unused space between the Physical Records written to the media, and which therefore delineate the start and end of each data block. (The term Physical Record and Data Block (BLKSIZE) are interchangeable.)

On 3390 DASD and earlier models of the Count Key Data (CKD) type, the Inter Block Gap had specific byte values, whereas on tape or cartridge there was an imperial measure in fractions of an inch which on 6250bpi open reels was 0.6 inches. There will be an equivalent gap on today's cartridges but the author has not been able to ascertain its value.

With the advent of modern Winchester type drives it would seem that the IBG is an irrelevance, except that z/OS is probably configured to use 3390 devices. Even though the physical recording of the data is very different from what the operating system understands, the I/O process is still dependent upon blocks of data, with typically one I/O event for each data block. The bigger the block the fewer the gaps there will be.

The diagram below attempts to illustrate the effect of blocking on a data set. No apology is made for reference to 6250 bpi tape, as although it is unlikely to be used today, the principals will generally apply.

### **Un-blocked data on tape**



In the above example, each record is written individually, and for a 6250 bpi tape with an IBG of 0.6 inches and with 100 records the effect would be:

- There are 100 individual I/O operations.
- 100 task suspensions pending I/O completion.
- 100 IBG's totaling a loss of 60 inches.

Each record would comprise 800 bits which means that there is more waste space than occupied by data as the total amount of tape used would be 60 inches of gaps and 12.8 inches of data.



Legac-E Education

## Inter-Block Gaps (IBGs)

---

### Blocked data on tape

If the same example is used but the data is groups into blocks of 5 records per block the results would be:

Record 1	Record 2	Record 3	Record 4	Record 5		Rec. 6
----------	----------	----------	----------	----------	--	--------

- There are 20 individual I/O operations.
- 20 task suspensions pending I/O completion.
- 20 IBG's totaling a loss of 12 inches.

If 100 byte records were written, then each record would comprise 800 bits which means that there is more waste space than occupied by data as the IBG is 0.6" whilst the block occupies 0.641". The total amount of tape used would be 12 inches of gaps and 12.82 inches of data.

The capacity has been improved by two thirds.