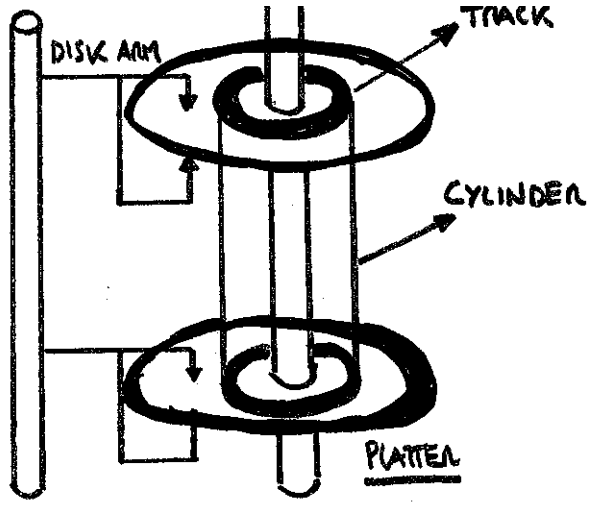

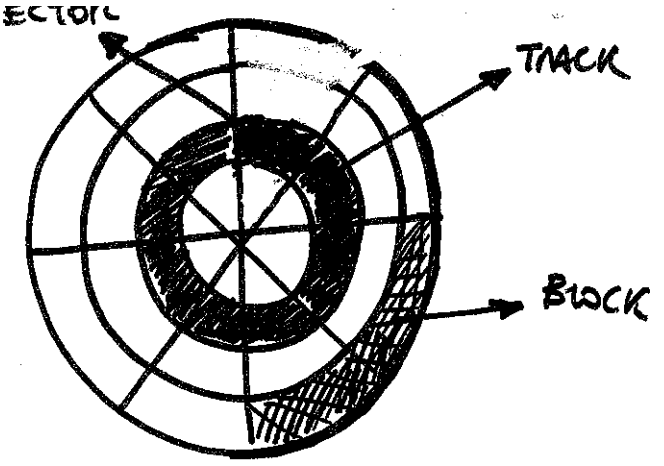

~~EXERCISE 1~~

DISK CHARACTERISTICS:

- 512 [BYTES / SECTOR]
- 50 [SECTORS / TRACK]
- 2000 [TRACKS / SURFACE]
- 5 N° OF PLATTERS
- 5400 rpm [ROTATIONS / MINUTE] (ROTATIONAL SPEED)
- 10 ms (SEEK TIME)
- 1 K BYTE = 1024 BYTES

(1) TRACK CAPACITY $50 \cdot 512 = 25600 = 25$ K BYTES

[BYTES / SECTOR] [SECTORS / TRACK] [BYTES / TRACK]

(2) SURFACE CAPACITY $25600 \cdot 2000 = 51'200'000 = 50'000$ K BYTE

[BYTES / TRACK] [TRACKS / SURFACE] [BYTES / SURFACE]

(3) DISK SURFACE $5 \cdot 2 \cdot 51200'000 = 512'000'000 = 500'000$ K BYTE

[PLATTERS / DISK] [SURFACES / PLATTER] [BYTES / SURFACE] [BYTES / DISK]

② NUMBER OF DISK CYLINDERS

NUMBER OF CYLINDERS = NUMBER OF TRACKS

$2000 \left[\frac{\text{TRACKS}}{\text{SURFACE}}\right] \rightarrow 2000 \left[\frac{\text{CYLINDERS}}{\text{DISK}}\right]$

③ AVERAGE TRANSFER TIME OF A BLOCK OF 4096 BYTES

DISK ROTATES AT 5400 rpm $\left[\frac{\text{ROTATIONS}}{\text{MINUTE}}\right]$

↳ TIME IN SECOND FOR 1 ROTATION

$\frac{1}{5400} \cdot 60 = 0{,}011 \left[\frac{\text{SECONDS}}{\text{ROTATIONS}}\right]$

$\left[\frac{\text{MINUTES}}{\text{ROTATIONS}}\right] \left[\frac{\text{SECONDS}}{\text{MINUTE}}\right]$

↳ AVERAGE DELAY = HALF ROTATION = 0,006 [SECONDS]

↳ A COMPLETE TRACK CAN BE TRANSFERRED PER ROTATION

$\text{DATA TRANSFER RATE} = \frac{25\,600}{0{,}011} \simeq 2\,327\,272{,}73 \left[\frac{\text{BYTES}}{\text{SECOND}}\right]$

$= 2250 \left[\frac{\text{K BYTES}}{\text{SECOND}}\right]$

[BYTES]

↳ $\frac{4096}{\frac{25\,600}{0{,}011}} = 0{,}011 \cdot \frac{4096}{25600} \simeq 0{,}00176$ $\left[\frac{\text{BYTES}}{\text{SECOND}}\right]$

TRANSFER TIME OF A BLOCK

↳ IN ADDITION WE HAVE TO ADD AN AVERAGE SEEK TIME AN AN AVERAGE DELAY

④

256 IS NOT A VALID BLOCK SIZE (HALF SECTOR)

2048 IS OK SINCE IT IS EQUIVALENT TO 4 SECTORS

51 200 IS NOT OK SINCE 100 > 50 (MAX 50 SECTOR PER TRACK)