

The file consists of $\frac{2MB}{512bytes} = 4000$ blocks.

$$T_{avg\ rotation} = \frac{1}{2} \times \frac{1}{15,000RPM} \times \frac{60secs}{1min} \times \frac{1,000ms}{1sec} = 2ms$$

$$T_{avg\ transfer} = \frac{1}{15,000RPM} \times \frac{1track}{1,000sectors} \times \frac{60secs}{1min} \times \frac{1,000ms}{1sec} = 0.004ms$$

Best case:

$$T_{access} = T_{seek} + T_{avg\ rotation} + 4000 \times T_{avg\ transfer} = 4ms + 2ms + 4000 \times 0.004ms = 22ms$$

Random case:

$$T_{access} = 4000 \times (T_{seek} + T_{avg\ rotation} + T_{avg\ transfer}) = 4000 \times (4ms + 2ms + 0.004ms) = 4000 \times 6.004ms = 24.016s$$