



ODRŽAVANJE RAČUNARSKIH SISTEMA

TEMA 8 –PRVI DEO

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- **HARD DISK**
- **PRINCIP RADA**
- **TIPOVI I KARAKTERISTIKE**
- **KARAKTERISTIČNI PROBLEMI I OTKAZI**



MAGNETIZAM

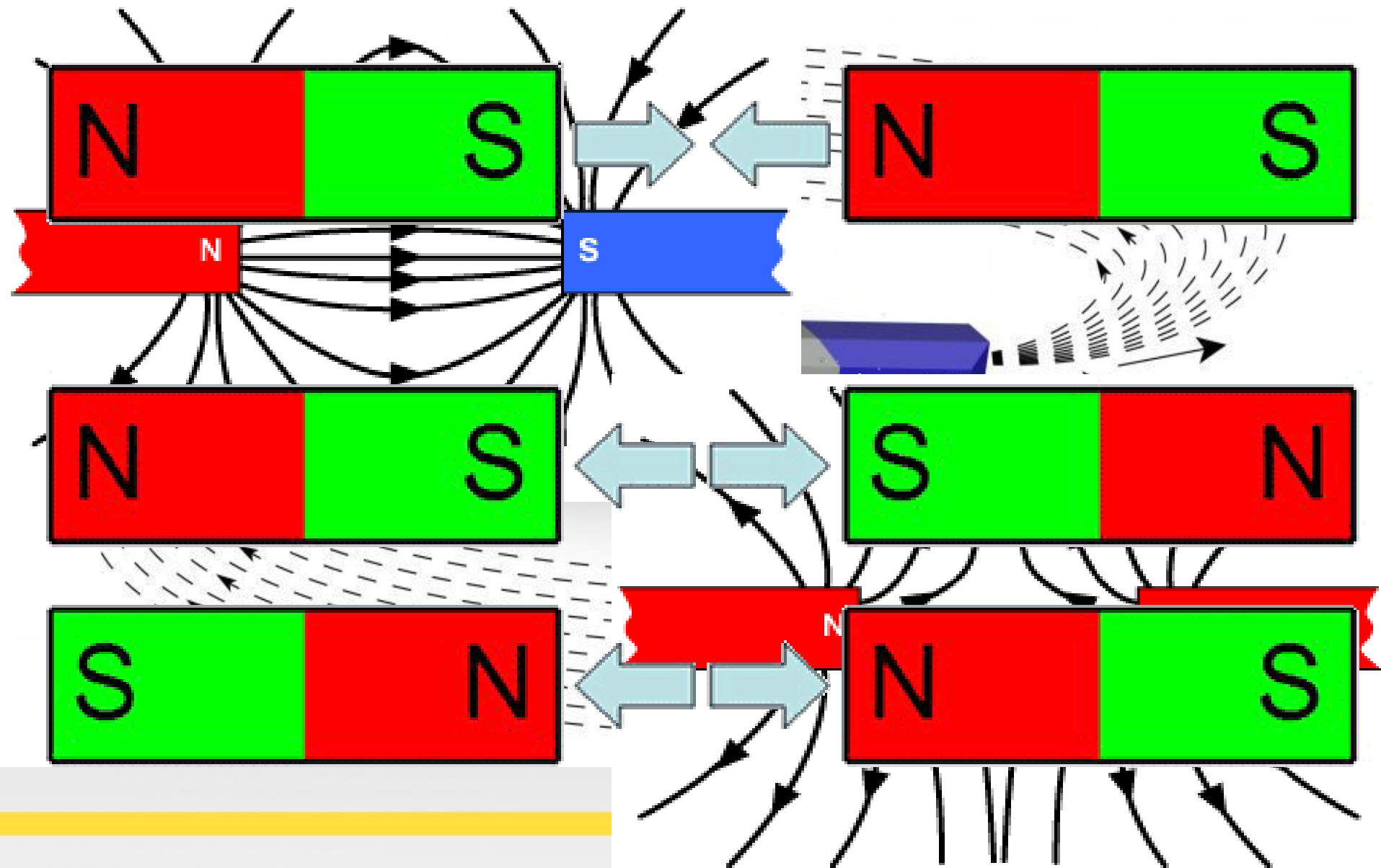


“MAGNETNI” MATERIJALI

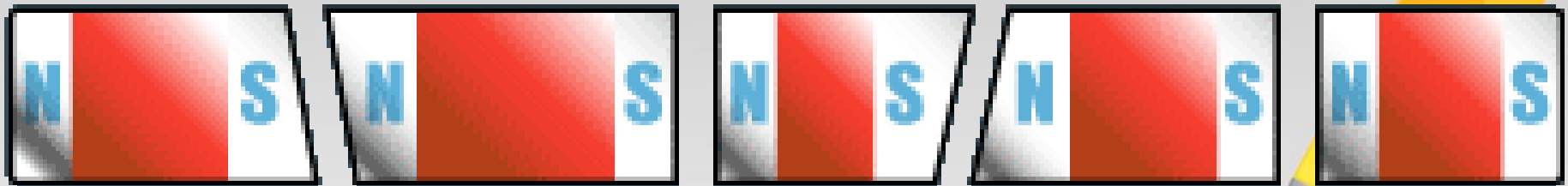
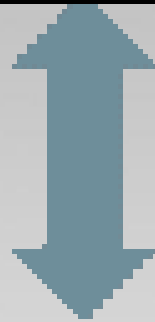
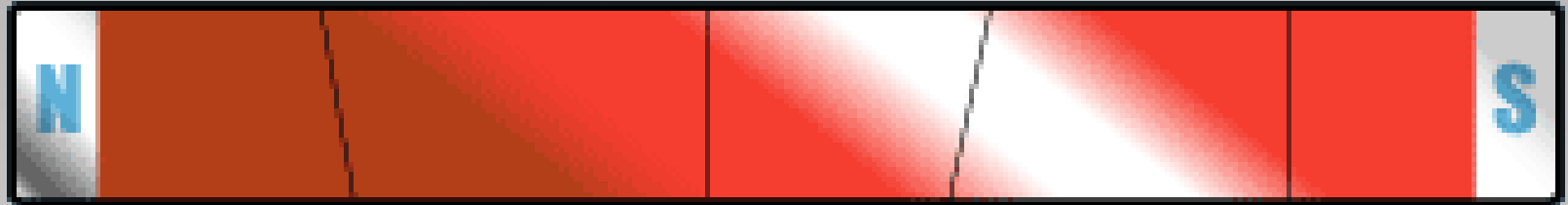
- GVOŽĐE (Fe)
- NIKL (Ni)
- KOBALT (Co)
- PLATINA (Pt)
- MAGNETIT (Fe_3O_4)
- AWARUIT (Ni_3Fe)
- WAIRAIT (CoFe)
- TETRATAENIT (FeNi)



MAGNET I INTERAKCIJA MAGNETA



SVOJSTVO MAGNETNOG MATERIJALA

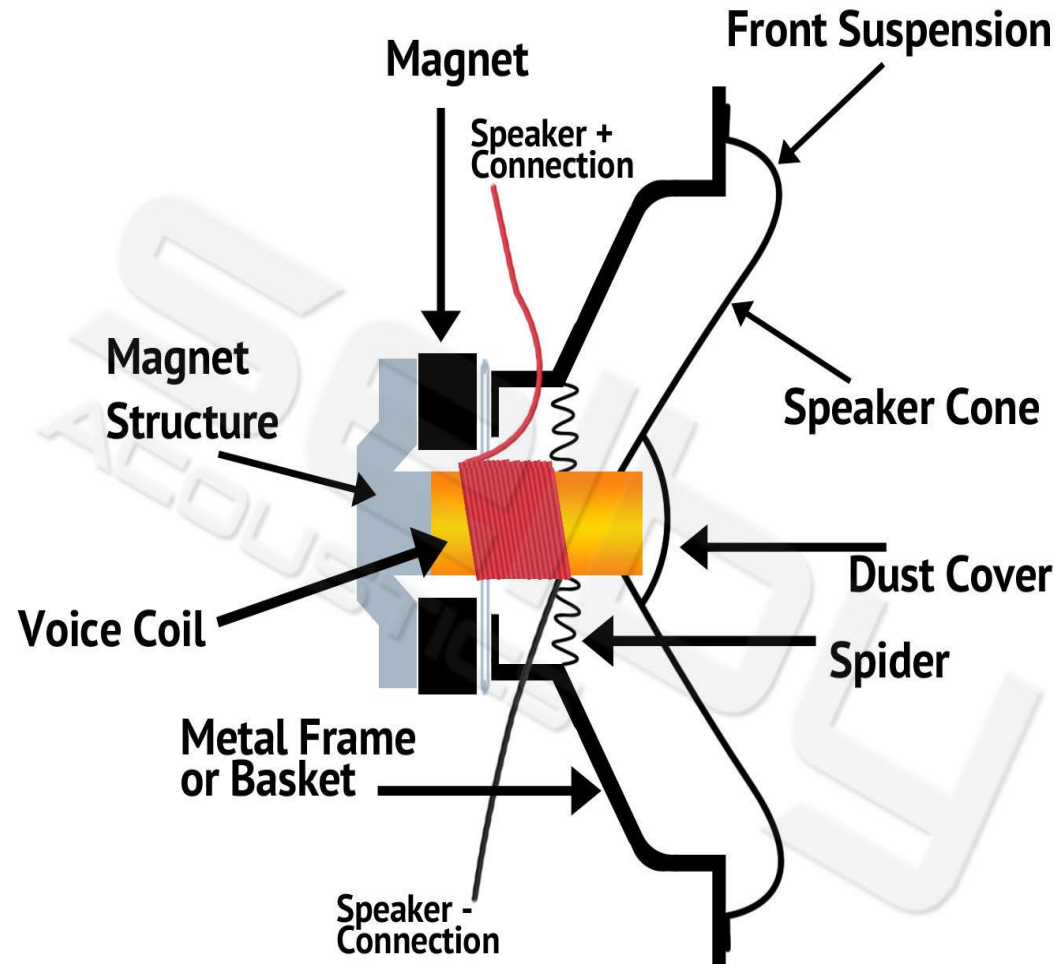
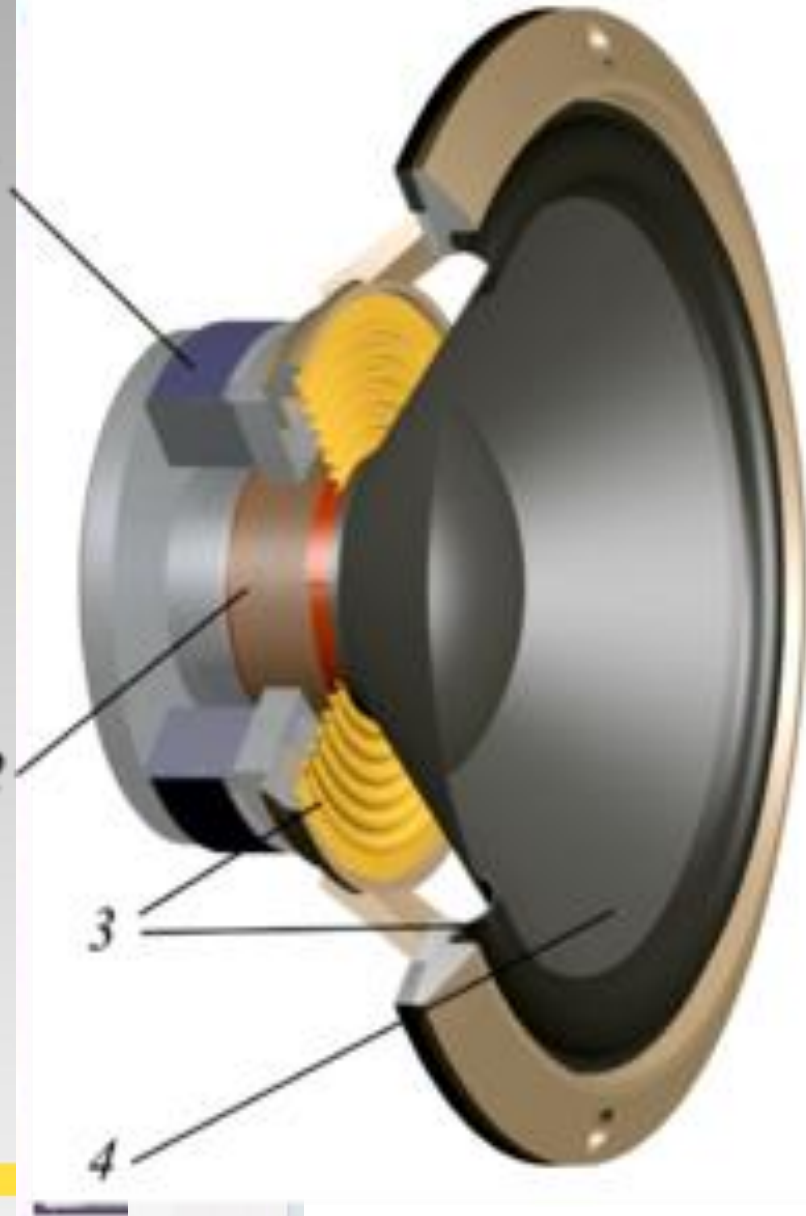


ELEKTROMAGNETI

- OTAC ELEKTROMAGNETIZMA JE ?
-JAMES MAXWELL, 1873.
- OSNOVNA FUNKCIONALNOST ELEKTROMAGNETA?
-MOGUĆNOST “UKLJUČIVANJA/ISKLJUČIVANJA”
MAGNETA PO POTREBI.



PRIMENA ELEKTROMAGNETA



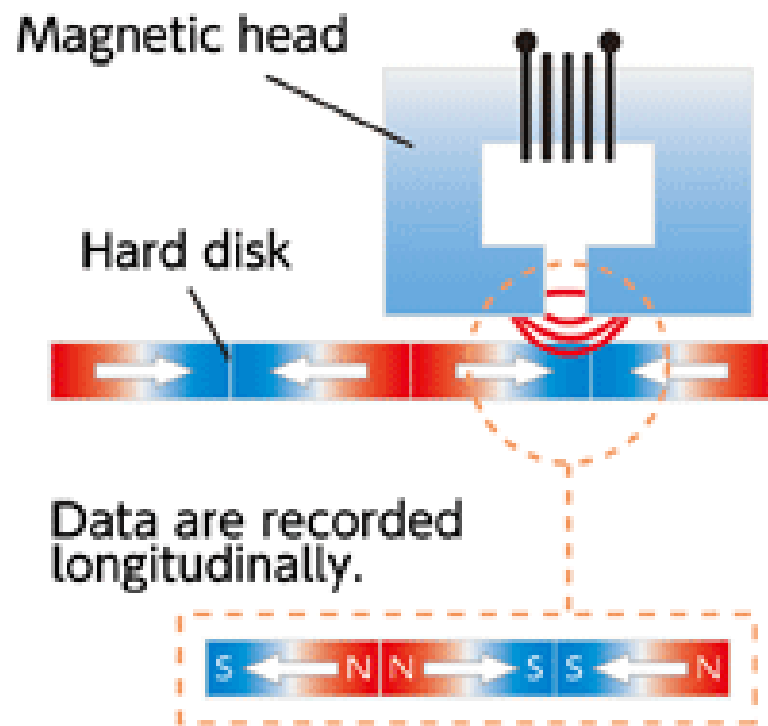
PRIMER ELEKTROMAGNETA



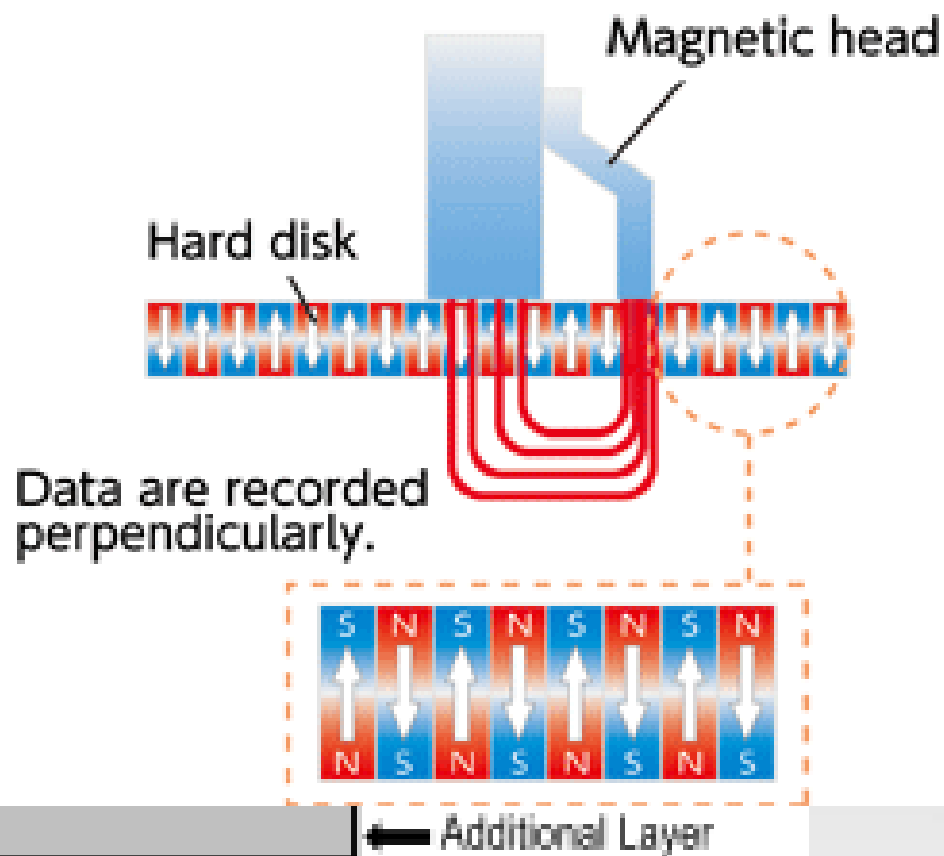
MAGNET KAO MEMORIJA

"Ring" writing element

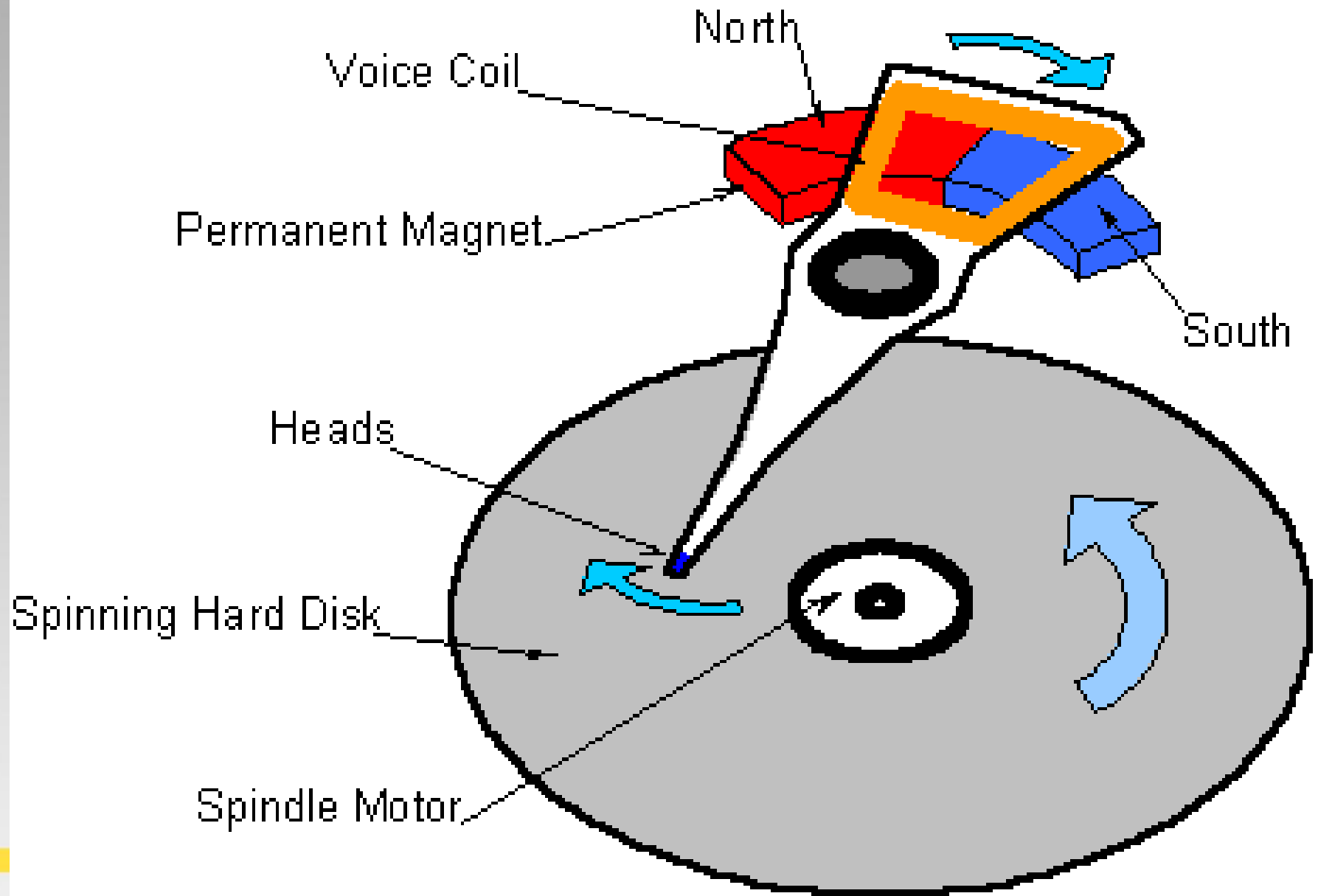
Longitudinal magnetic recording



Perpendicular magnetic recording



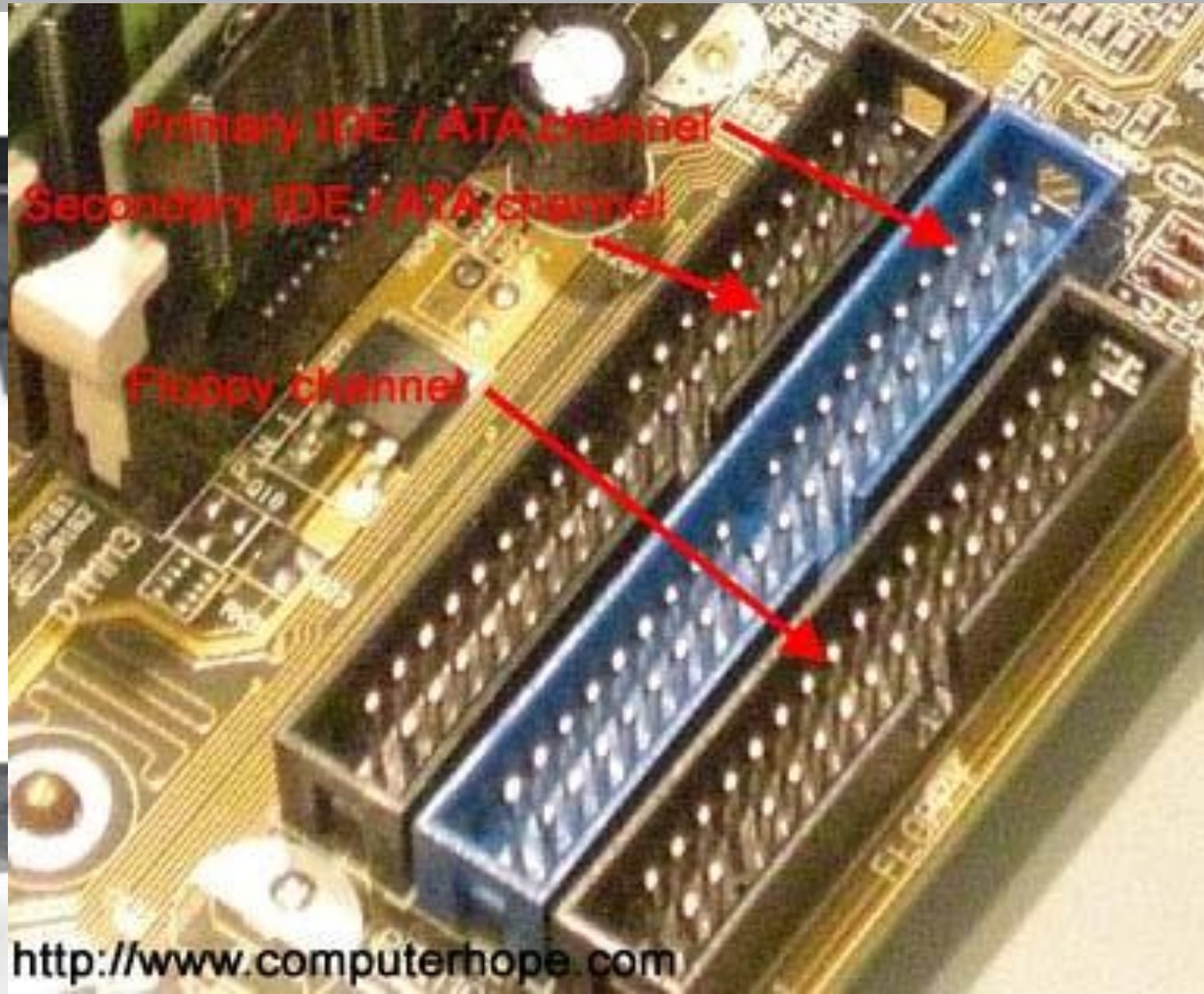
ANATOMIJA HDD-A



TIPOVI HDD-A



IDE/ATA INTERFEJS



SERIAL ATA (SATA) INTERFEJS

- SATA-1 (2003) /
- SATA-2 (2004) /
- SATA-3 (2008) /



SCSI INTERFEJS

SCSI Standard	Bus Width/Type*	Burst Transfer	max. Bus Length
SCSI-1	8 bit, SE	5 MB/s	6 Meters
SCSI-2 (Fast SCSI, Fast Narrow)	8 bit, SE	10 MB/s	3 Meters
SCSI-2 Fast Wide (Wide SCSI)	16 bit, SE	20 MB/s	3 Meters
SCSI-2 Differential Narrow	8 bit, HVD	10 MB/s	25 Meters
SCSI-2 Differential Wide	16 bit, HVD	20 MB/s	25 Meters
SCSI-3 Ultra Narrow (Fast-20)	8 bit, SE	20 MB/s	3 Meters
SCSI-3 Ultra Wide	16 bit, SE	40 MB/s	3 Meters
SCSI-3 Wide Ultra2	16 bit, LVD	80 MB/s	12 Meters
SCSI-3 Wide Ultra3	16 bit, LVD	320 MB/s	12 Meters

* SE = Single Ended, HVD = High Voltage Differential, LVD = Low Voltage Differential

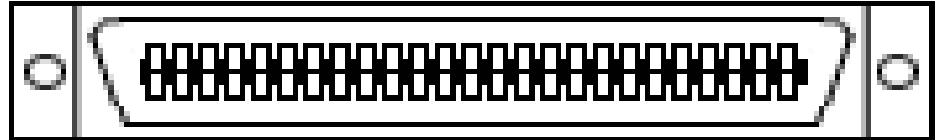
SCSI KONEKTORI

DB-25 Male External



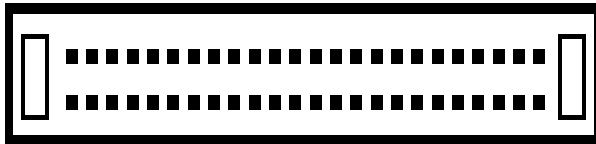
<http://www.computerhope.com>

Low-Density, 50-pin, Male External



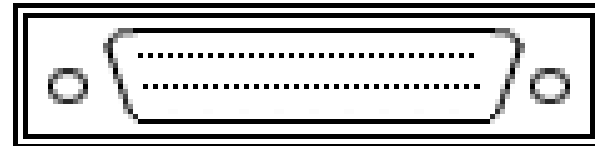
<http://www.computerhope.com>

Low-Density, 50-pin, Male Internal



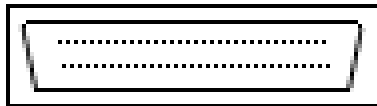
<http://www.computerhope.com>

High-Density, 68-pin, Male External



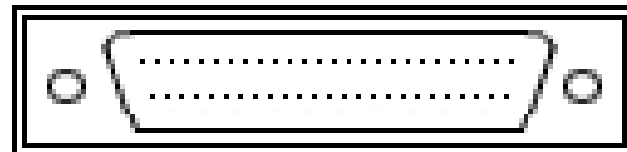
<http://www.computerhope.com>

High-Density, 68-pin, Male Internal



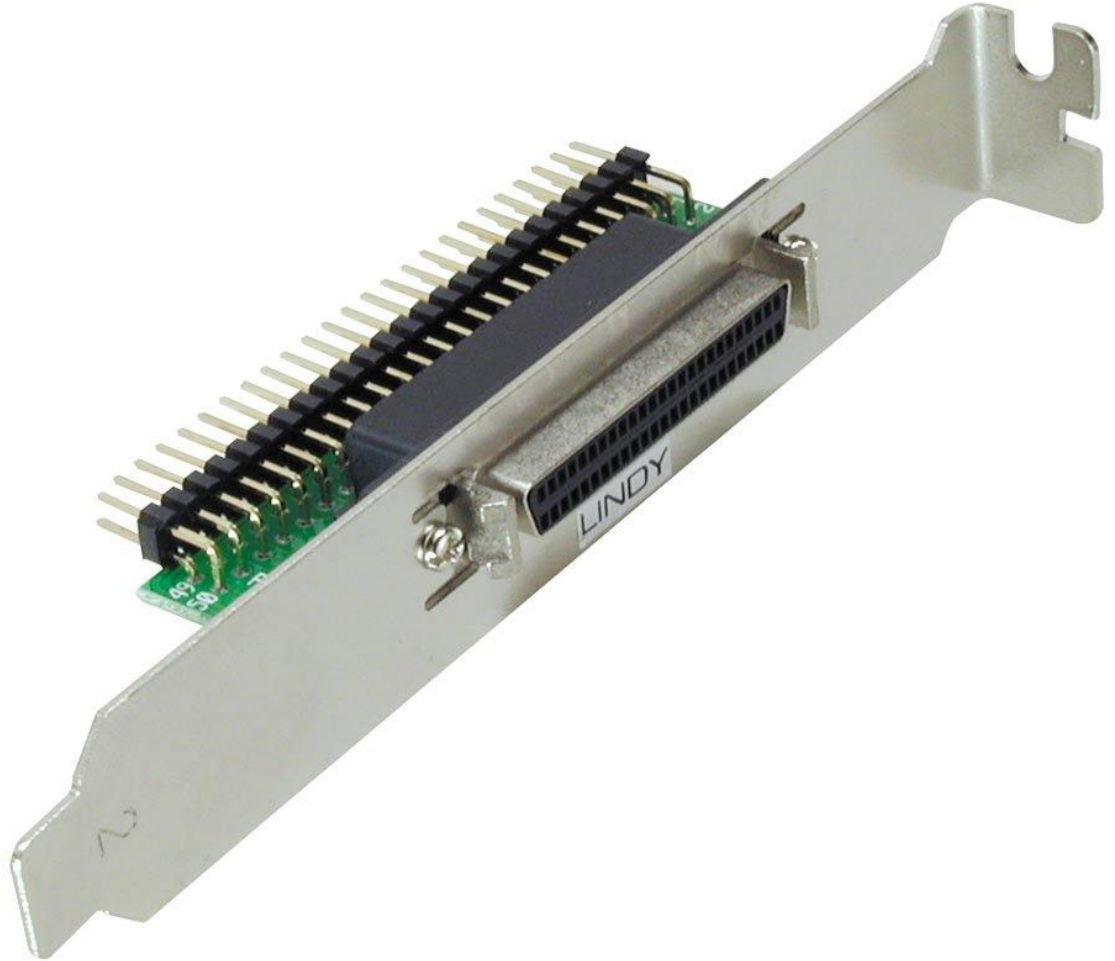
<http://www.computerhope.com>

High-Density, 50-pin, Male External



<http://www.computerhope.com>

SCSI KABLOVI



SAS INTERFEJS

- SAS-1 (2005) /3 Gbps
- SAS-2 (2009) /6 Gbps
- SAS-3 (2013) 12 Gbps



NAMENSKE KATEGORIJE



- OPŠTA NAMENA
- DOBAR ODNOS
CENA/Gb
- VELIKI RASPON
KAPACITETA*
- NIJE AKCENAT NA
PERFORMANSAMA



- ŠTEDLJIV NA ENERGIJI
- MANJA POTROŠNJA STRUJE
- VELIKI RASPON KAPACITETA
- SLABIJE PERFORMANSE
- KRAČI ŽIVOTNI VEK



- OPTIMIZOVAN ZA BRZINU
- MAKSIMALNE PERFORMANSE
- GARANCIJA 5 GODINA*
- VEĆA BUKA
- JAČE ZAGREVANJE
- CENA



- OPTIMIZOVAN ZA STORAGE
- 3D Active Balance Plus – KONTROLA VIBRACIJA
- MANJE ZAGREVANJE
- DUŽI LIFE-CYCLE
- GARANCIJA 3 GODINE
- SLABIJE PERFORMANSE
- CENA



- OPTIMIZOVAN ZA DVR UREĐAJE
- 24/7 REŽIM RADA
- 3D Active Balance Plus – KONTROLA VIBRACIJA
- MANJE ZAGREVANJE
- DUŽI LIFE-CYCLE
- POGODNI ZA RAID
- SLABIJE PERFORMANSE
- CENA



- ENTERPRISE CLASS
- 24/7 REŽIM RADA
- PROJEKTOVANI ŽIVOTNI VEK 2 MILIONA RADNIH SATI !!!
- DUŽI LIFE-CYCLE
- POGODNI ZA RAID
- VRHUNSKÉ PERFORMANSE
- CENA !!!



SSD HDD

- **SOLID**
- **STATE**
- **DRIVE**



SSD Controller

SATA
and
Power



Config and
General I/O

More FLASH
on back ↻

- **NEMA MEHANIČKIH DELOVA**
- **MNOGO VEĆA BRZINA (DO 500MBps)**
- **CENA**

SSHD HDD

- **S**OLID
- **S**TATE
- **H**YBRID
- **D**RIVE



- **OSETNO VEĆA BRZINA (DO 190Mbps)**
- **VEĆI KAPACITET**
- **“SPOR START”**
- **CENA**

THANK YOU



FOR YOUR ATTENTION