

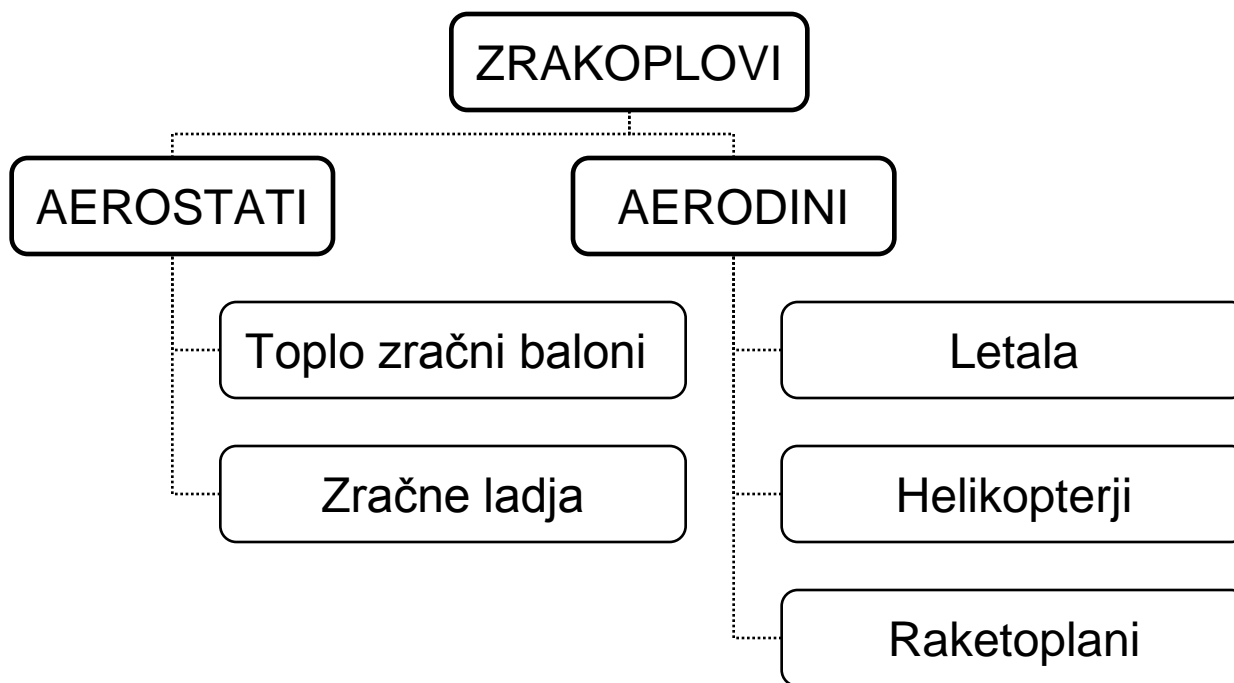
# MEHANIKA LETA HELIKOPTERJA

Primož Škufca

# Vsebina predmeta:

- Uvod
- Osnovni princip delovanja helikopterja
- Osnovne definicije
- Aerodinamični preračun rotorja
  - Teorija idealnega rotorja – osnovna metoda
  - Teorija elementa kraka rotorja
  - Kombinirana metoda
  - Vrtinčne metode
  - Numerične metode
- Dinamika rotorja
- Letalne lastnosti helikopterja

# Umestitev helikopterjev

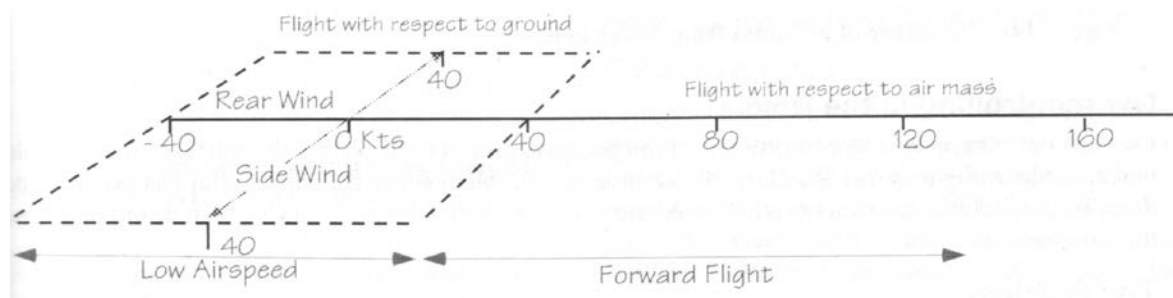


# Helikopterje delimo po:

- Namenu: Civilni / Vojaški / Specialni
- Pogonu: Batni / Turbo-gredni
- Po številu nosilnih rotorjev:
  - En glavni rotor + naprava za stabilizacijo
  - Dvojni glavni rotor:
    - Dva nosilna rotorja
    - Tandemski rotor
    - Sinhro rotor

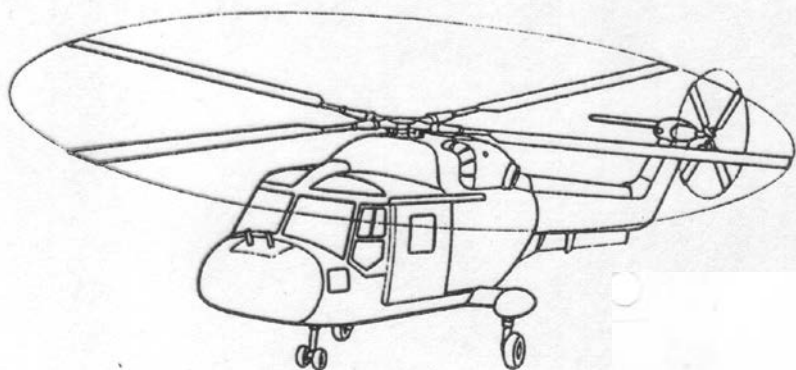
# Sposobnosti helikopterjev:

- Lebdenje
- Vertikalno premikanje – ničta hitrost (zero speed)
- Mala hitrost letenja
- Večja hitrost premikanja/letenja

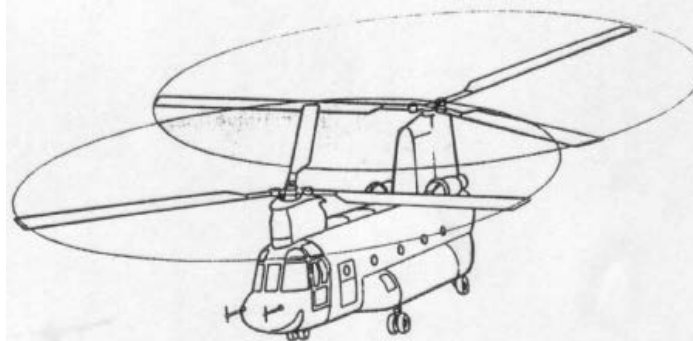
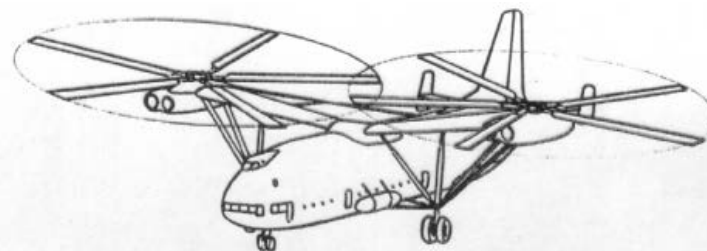


# Delitev helikopterjev: 1/2

En glavni rotor +  
naprava za stabilizacijo

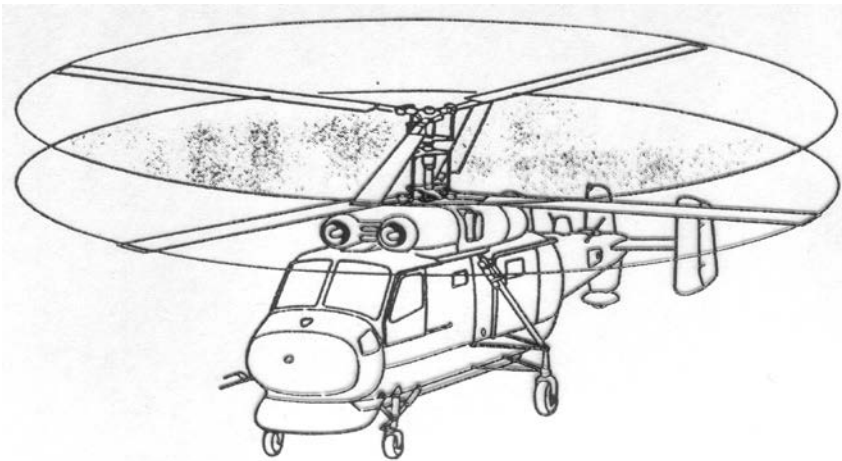


Dva nosilna rotora



# Delitev helikopterjev: 2/2

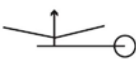


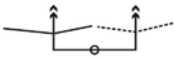




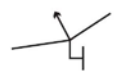


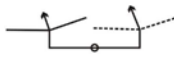

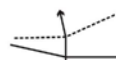

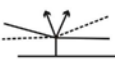
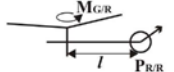
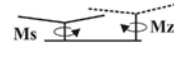

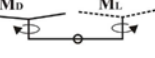
Tandemski rotor



Sinho rotor

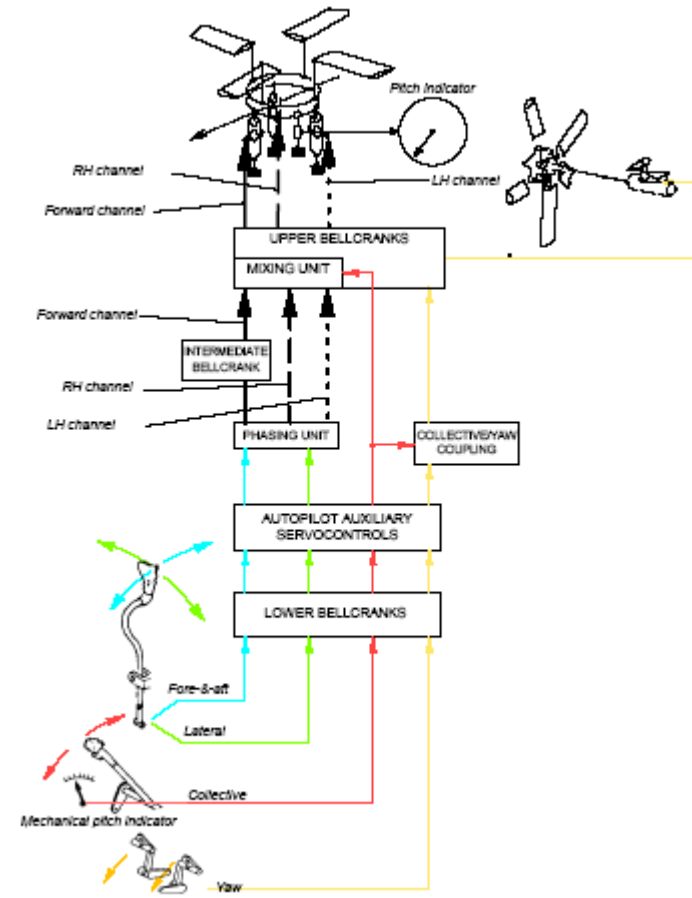
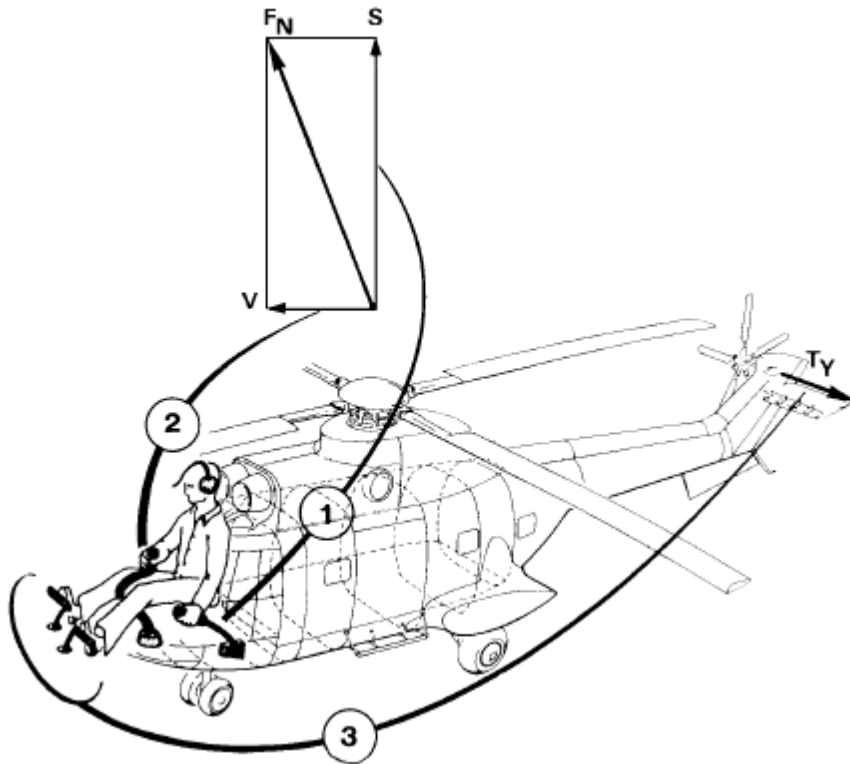


# Princip komand helikopterjev: 1/5

	KONFIGURACIJA			
KONTROLA	REPNI ROTOR	TANDEMSKI R.	KOAKSIALNI R.	EDEN OB DRUGEM TILT ROTOR
VERTIKALNA	 G/R KOLEKTIV	 G/R KOLEKTIV	 G/R KOLEKTIV	 G/R KOLEKTIV
VZDOLŽNA	 G/R CIKLIK	 G/R DIF. KOLEKTIV IN CIKLIK	 G/R CIKLIK	 G/R CIKLIK
PREČNA	 G/R CIKLIK	 G/R CIKLIK	 G/R CIKLIK	 G/R DIF. KOLEKTIV IN CIKLIK
SMERNA	 R/R KOLEKTIV	 G/R DIF. CIKLIK	 $M_{zg} \neq M_{sp}$	 G/R DIF. CIKLIK
URAVNOTEŽENJE MOMENTOV	 $M_{GR} = M_{PRR}$ $M_{PRR} = P_{RR} \cdot l$	 $M_z = M_s$	 $M_{zg} = M_{sp}$	 $M_o = M_l$
<p>OZANKE: G/R - glavni rotor; R/R - repni rotor; S - spredaj; Z - zadaj; L - levo; D - desno; sp - spodnji; zg - zgornji; P - potisk; M - moment</p>				

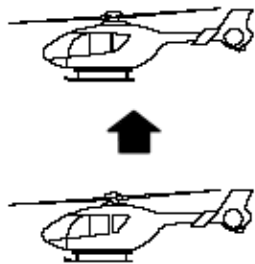
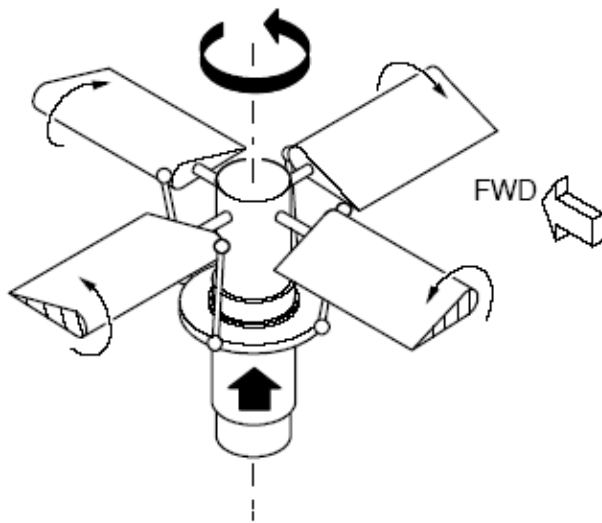


# Princip komand helikopterjev: 2/5

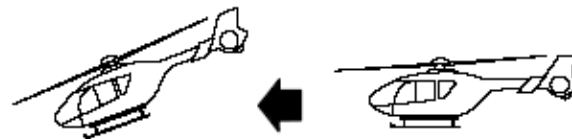
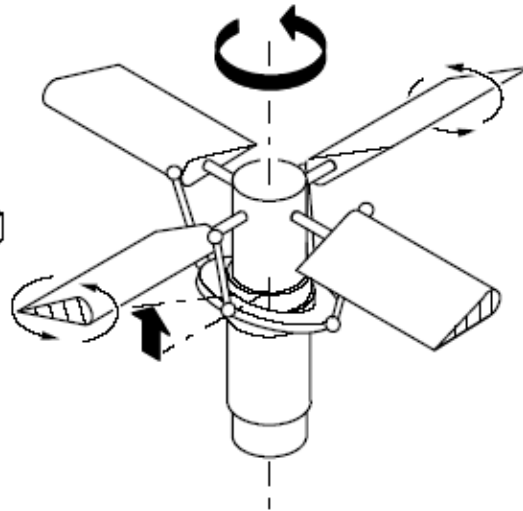


# Princip komand helikopterjev: 3/5

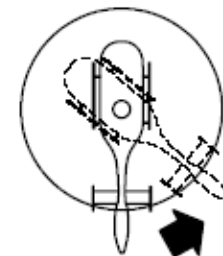
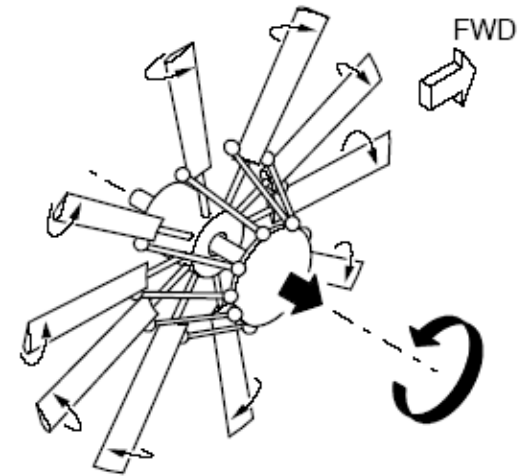
Collective Control  
Main Rotor



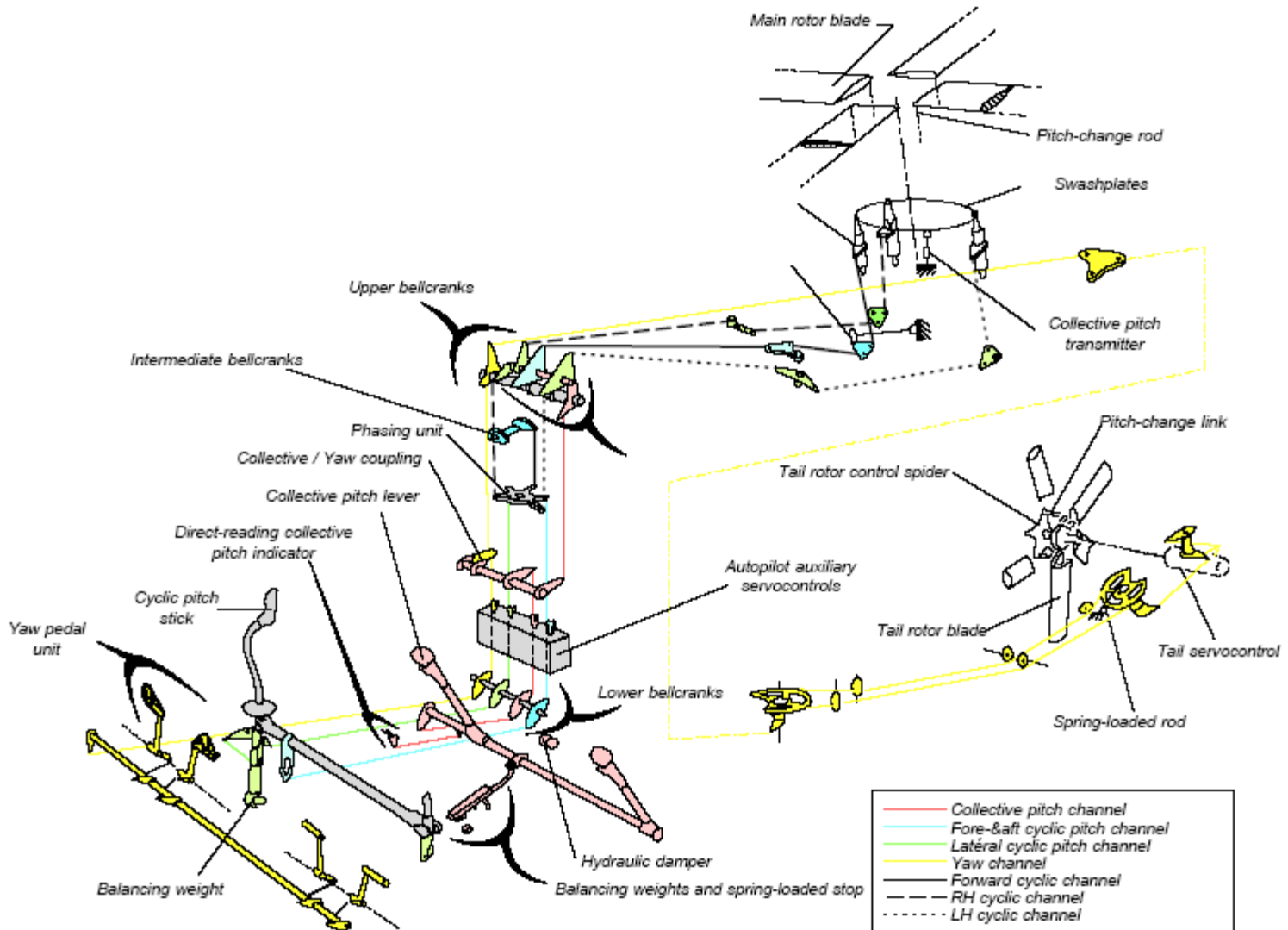
Cyclic Control  
Main Rotor



Yaw Control  
Tail Rotor



# Princip komand helikopterjev: 4/5



# Princip komand helikopterjev: 5/5

