Materi 6
Sistem Propulsi pada Drone

MOOC UNAIR

Merakit dan Mengaplikasikan Robot Terbang/ Drone untuk Pemula dengan Menggunakan Platform Open Source

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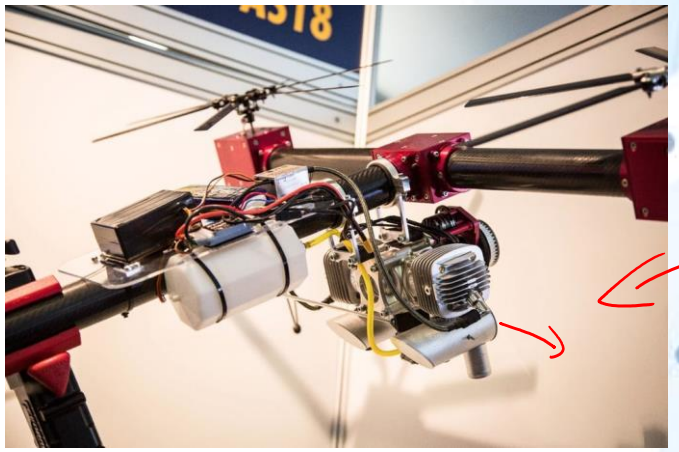
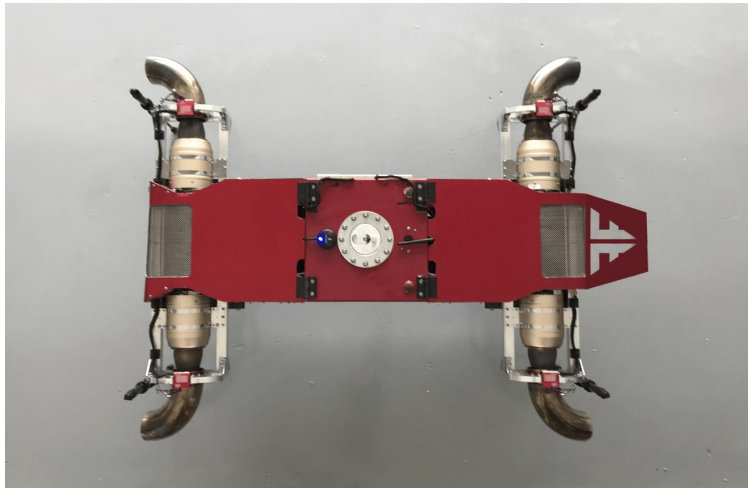
Types of Drone Propulsion System

Electric ducted fan



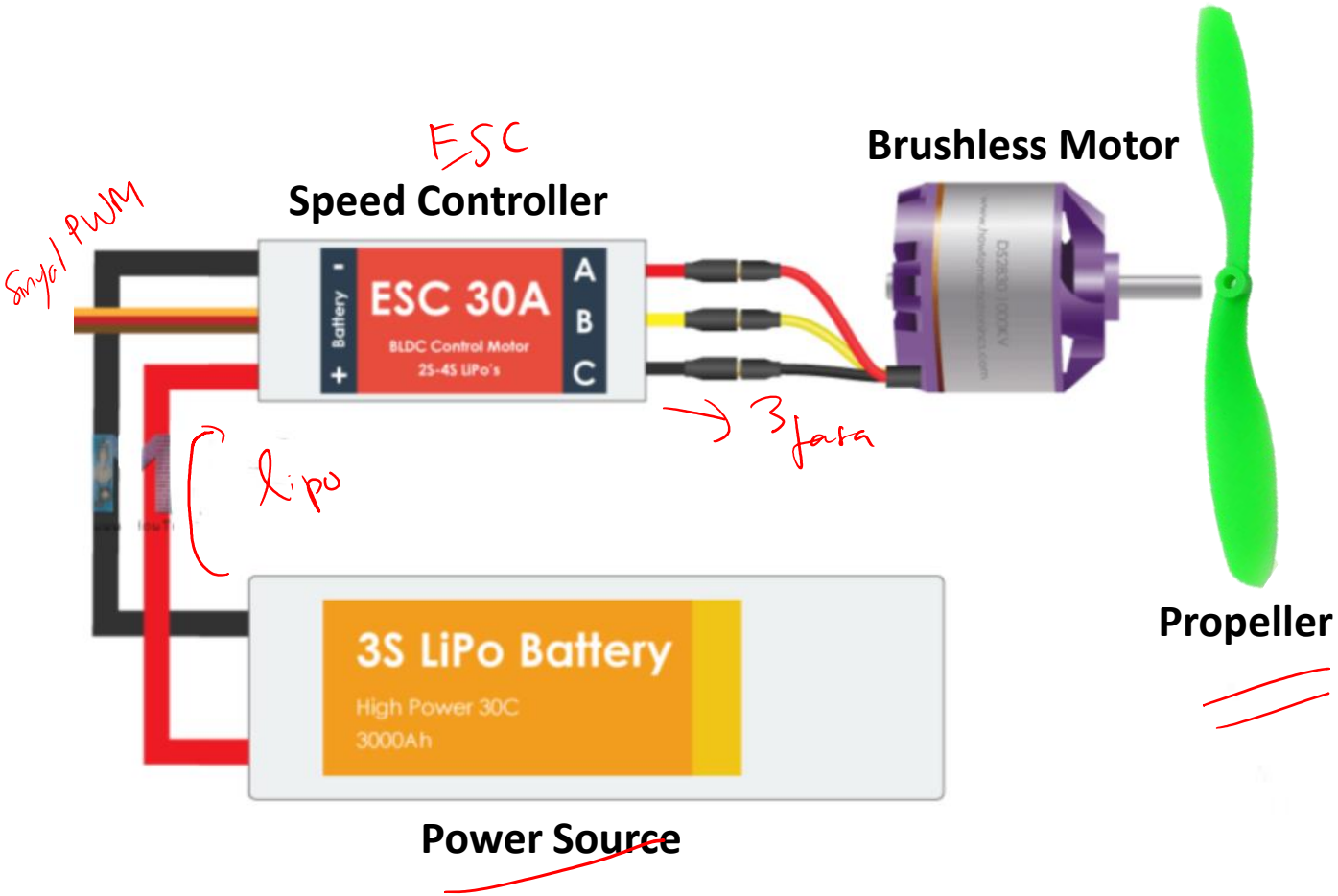
Internal Combustion Engine Drone



Jet Powered Quad

Brushless DC motor with Propeller

Overview Sistem Propulsi pada Drone



Propeller (Baling-baling)

① Pitch

The pitch of a propeller is a measure of how far it can move through the air in a single rotation.

Size

The size of a propeller, also referred to as its length, is merely the propeller's diameter measured tip to tip

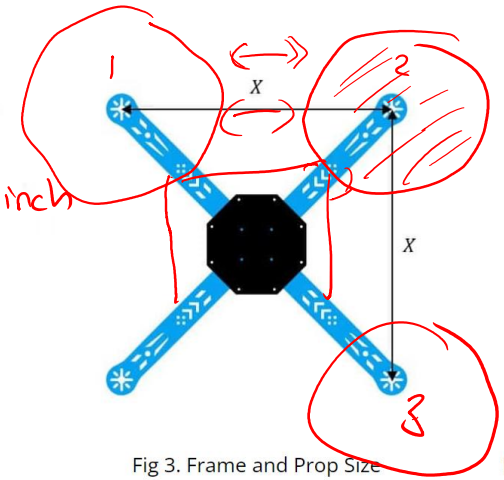


Fig 3. Frame and Prop Size

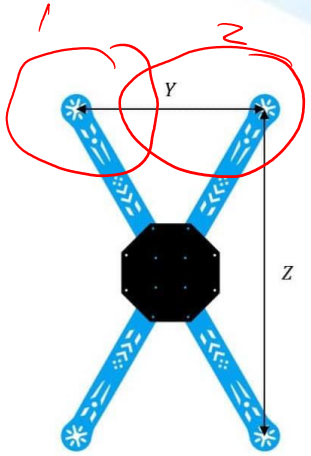
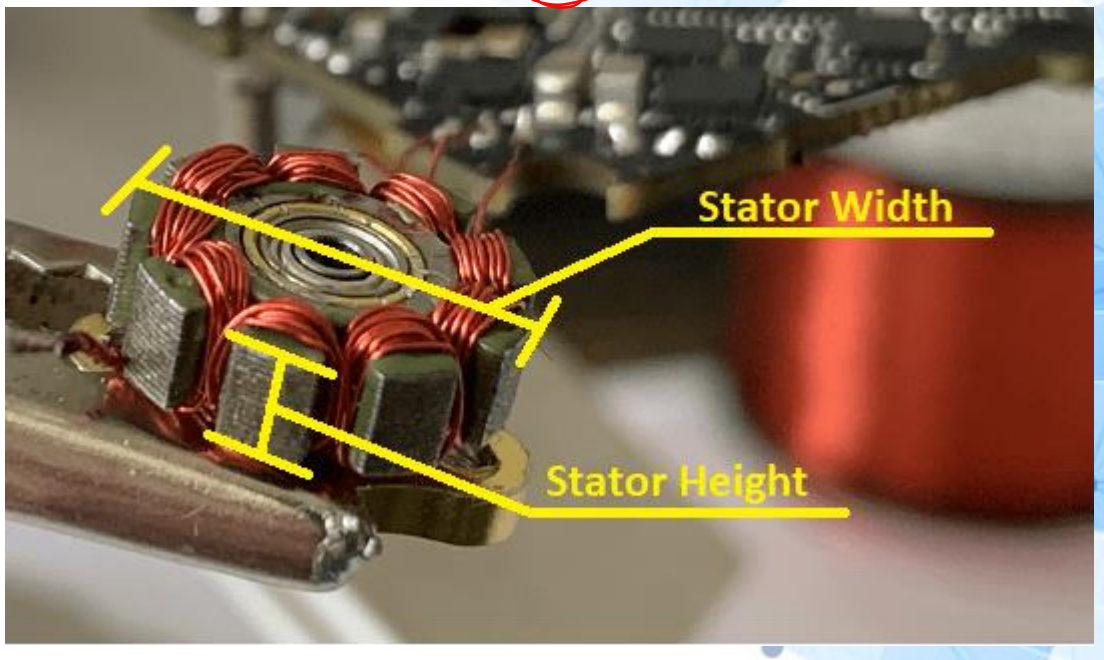


Fig 4. Minimum Frame and Prop Size

Brushless Motor Code & KV Rating

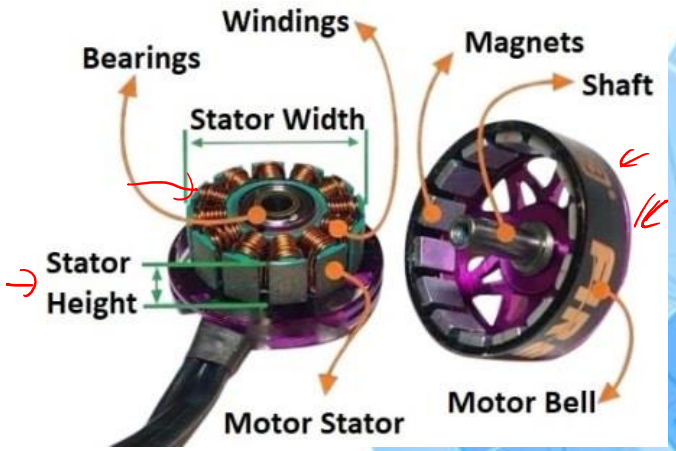
Brushless DC motors in the RC world are marked with a 4- digit number: XXYY “XX” refer to stator width & “YY” refer to stator height.

The torque depends on those two parameters- the wider and higher it is, the motor is more capable of making a higher torque.



KV represents the speed at which the motor rotates for every volt applied to the motor.

For example, if we used 3s (11.1V) to power 1300Kv motor, the maximum number of motor rotations would be approximately **1300x11.1 = 14430RPM.**



How to select Motor & Propeller Specs

Case example:

2212 920KV Brushless Motor 2-4S

2212 920KV Thrust Data Table

ML2212 MOTOR								
Item NO.	Volts (V)	Prop	Throttle	Amps (A)	Watts (W)	Thrust (g)	Efficiency (g/W)	Operating temperature(℃)
ML2212 920KV	11.1V	DJI9.4*4.3	50%	1.8	20.0	230	11.5	37℃
			65%	2.8	31.1	310	10.0	
			75%	3.9	43.3	410	9.5	
			85%	5.5	61.1	480	7.9	
			100%	7.6	84.4	610	7.2	
		APC10*4.5	50%	2.6	28.9	290	10.0	55℃
			65%	5.1	56.6	460	8.1	
			75%	7.4	82.1	590	7.2	
			85%	10.1	112.1	730	6.5	
			100%	13.4	148.7	860	5.8	
	14.8V	DJI9.4*4.3	50%	2.7	40.0	350	8.8	52℃
			65%	4.4	65.1	490	7.5	
			75%	6.3	93.2	640	6.9	
			85%	8.3	122.8	790	6.4	
			100%	11.5	170.2	990	5.8	
Notes: The test condition oftemperature is motor surface temperature in 100% throttle while the motor run 10 min. environment temperature 24℃								