DESIGN WORKSHOP

STORM Design Workshop

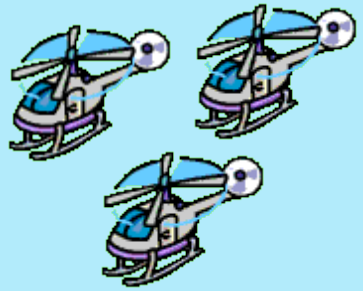
- **Be quiet**
- **Pay attention**
- **Take notes**
- **Ask questions**

THEN:

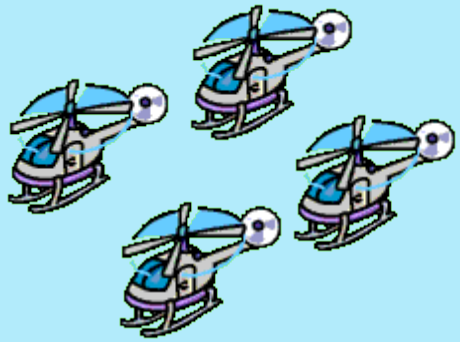
- **Make a plan**
- **Follow the plan (with flexibility)**

STORM Design Workshop

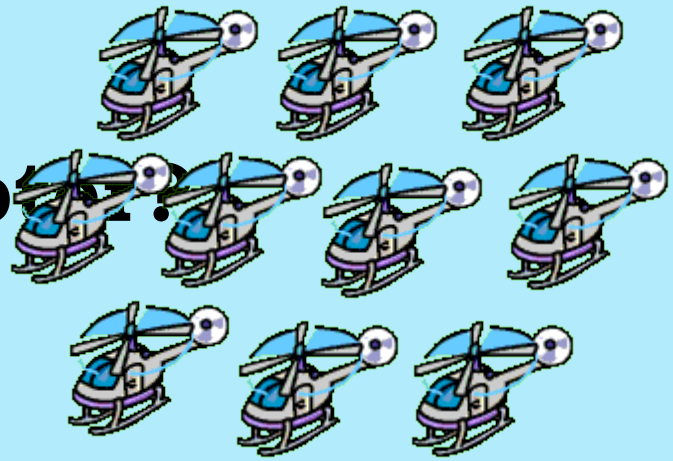
- **Do I make a 3-copter?**



- **Do I make a 4-copter?**



- **Do I make a More-copter?**



STORM Design Workshop

- **You must pay close attention to:**

BALANCE

STORM Design Workshop

- **You must pay close attention to:**

  - **Center of Gravity**
  - **Center of Mass**
  - **Center of Rotation**

STORM Design Workshop

Center of Gravity

- **BALANCE during takeoff**
- **BALANCE during landing**
- **Does landing gear add or subtract from this?**

STORM Design Workshop

Center of Mass

- **BALANCE in flight**
- **Do all engines (or engine pairs) have the same lift effect?**

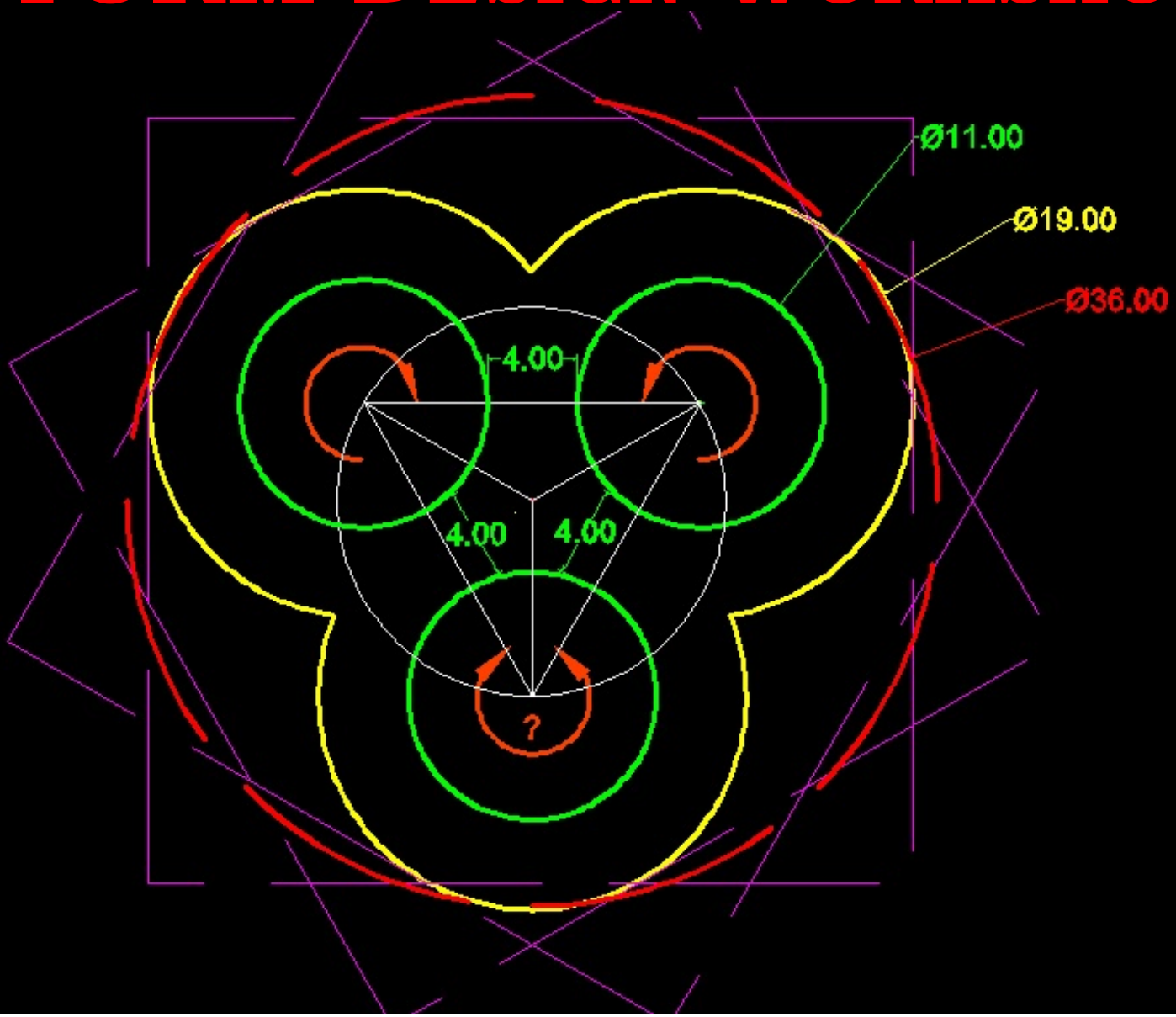
STORM Design Workshop

Center of Rotation

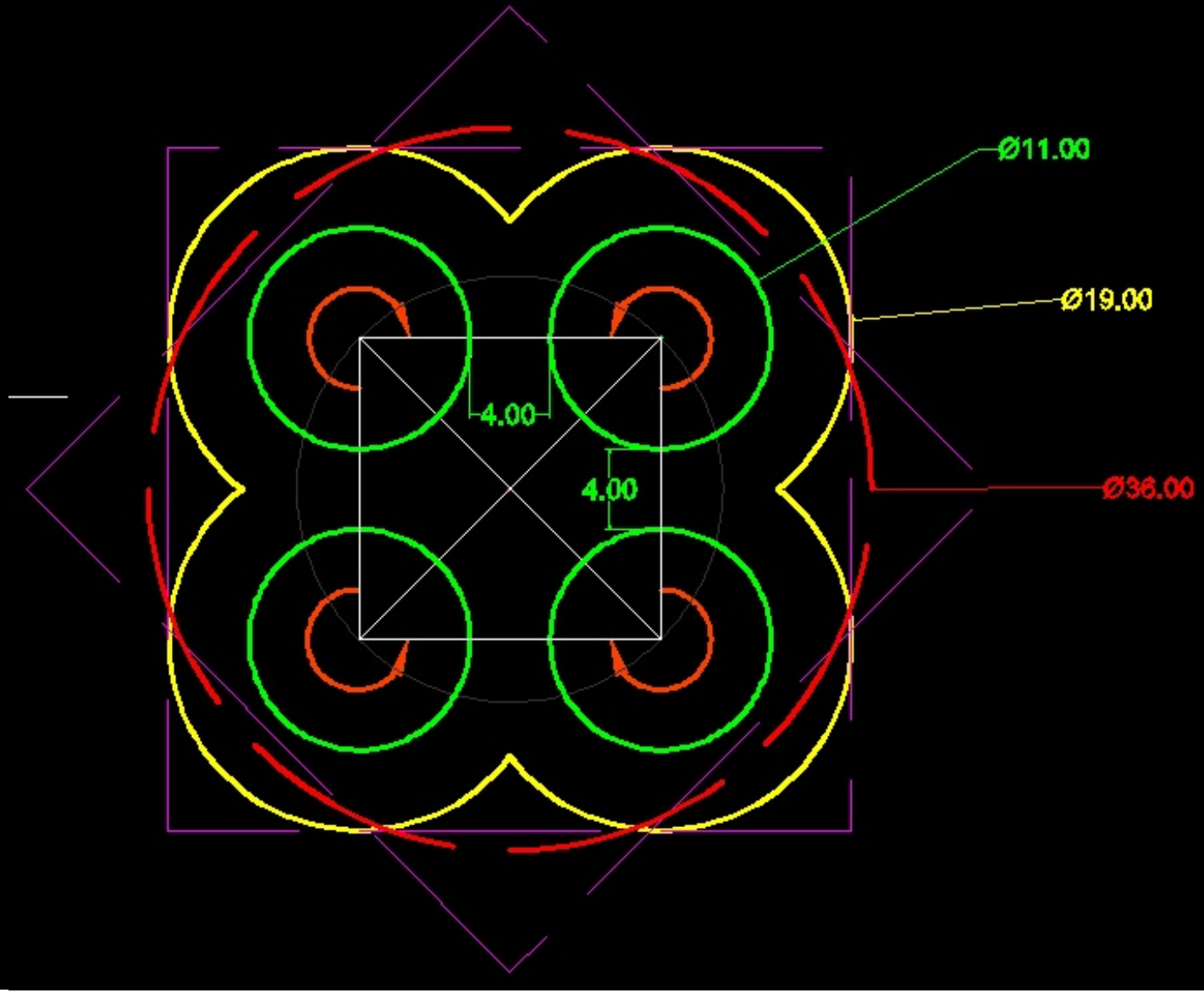
- **BALANCE during entire flight**
  (360° of freedom)

- **Do the engine torques balance, or must you continually compensate?**

STORM Design Workshop



STORM Design Workshop



STORM Design Workshop

- **You must pay close attention to:**

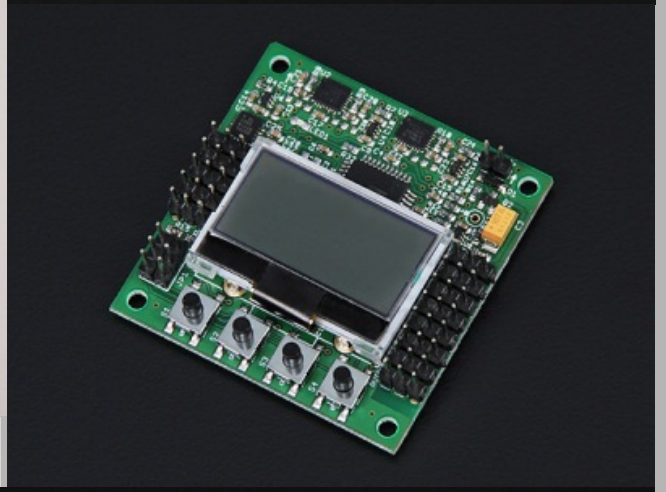
WEIGHT

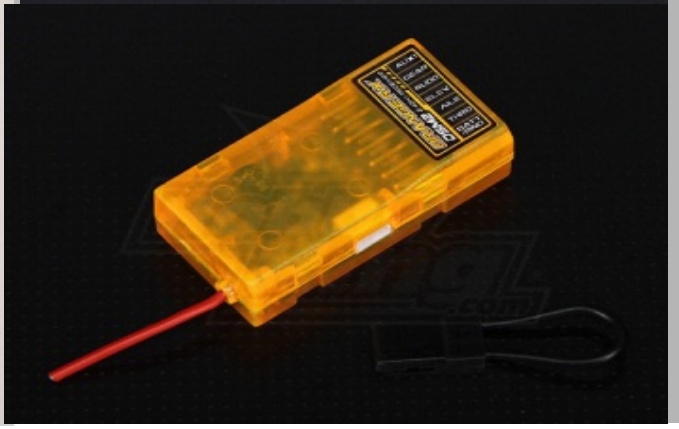
STORM Design Workshop

- **This is your engine …**
  - **hexTronik DT750 Brushless Outrunner 750kv**
  - **Maximum of 4**
  - **Max. Lift 1000g each**

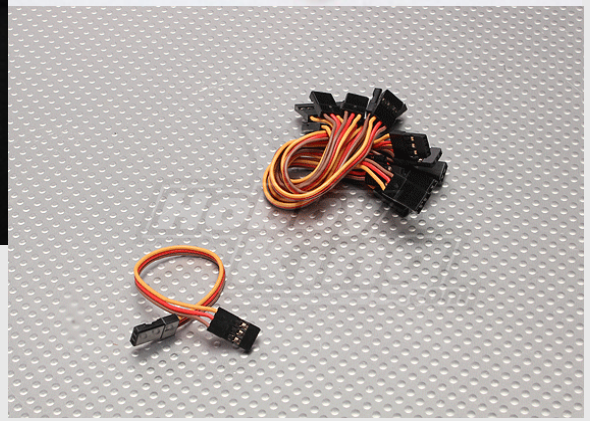
STORM Design Workshop

- **This means the GROSS weight of you vehicle MUST be no more than 1000g times the number of engines**
- **GROSS = everything …**
  - **Frame**
  - **Wires**
  - **Battery**
  - **Camera**
  - **Processor**
  - **Controllers**
  - **Condensation**
  - **Tape**
  - **Solder**
  - **Paint**
  - **Decals**
  - **Screws**
  - **Nuts**
  - **Received**
  - **Zip ties**
  - **Engines**
  - **Wires**
  - **Finger Prints**
  - **Glue**
  - ***Everything!***






TURNIGY
nano-tech 3.0
3000mAh 25-50C DISCHARGE
HIGH DISCHARGE LI-PO BATTERY




hobbycity
X
y


3.5mm Gold Connector


3.5mm Gold Connector

STORM Design Workshop

- **You should be able to hoover at less than 60% power**
  (i.e. Gross weight < 60% max lift)

- **WHY?**

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- **You must pay close attention to:**

Aerodynamics

STORM Design Workshop

- **Airflow to and off engines MUST be as unobstructed as possible.**
- **Copter design and layout must be as symmetrical as possible.**
- **DO NOT reduce engine efficiency or introduce uncontrolled variables through poor design practices.**

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- **You must pay close attention to:**

DETAILS

STORM Design Workshop

- **Brainstorming is about ideas**
- **Sketching is about ideas**
- **Daydreaming is about ideas**

- **Design is about …**

DETAILS

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- Is the frame balanced?
- Are the components laid out symmetrically?
- Are the wires the same length?
- Are the solder joints even?
- Are the engine torques balanced?
- Are the thrust vectors balanced?
- Are there enough critical parts?

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- Where is the Center of Gravity?
- Where is the Center of Mass?
- What percent of maximum engine power is required to hoover?
- Is the design symmetrical?
- How many axes of symmetry are there in this design?
- Why do you feel overwhelmed?

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Questions?

DESIGN WORKSHOP