

GYROPLANES



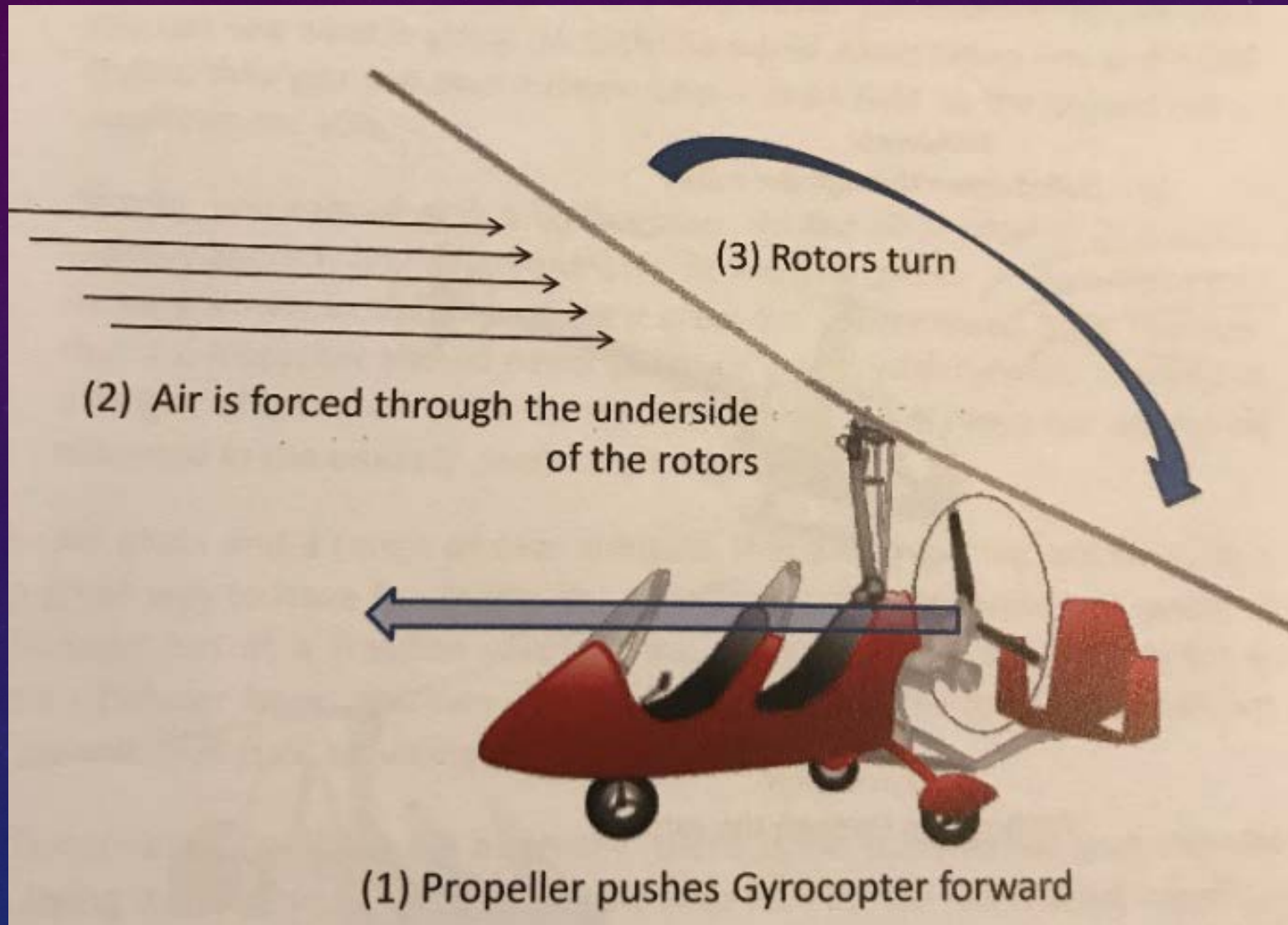
LETTING THE AIR
DO THE WORK

MIKE MONTEFUSCO



DEFINITION...

- Autogyro
 - also known as a **gyroplane** or **gyrocopter**
 - type of rotorcraft that uses an **unpowered rotor** in **free autorotation** to develop lift
- Forward thrust provided independently
 - typically by an engine-driven propeller



DID YOU KNOW...

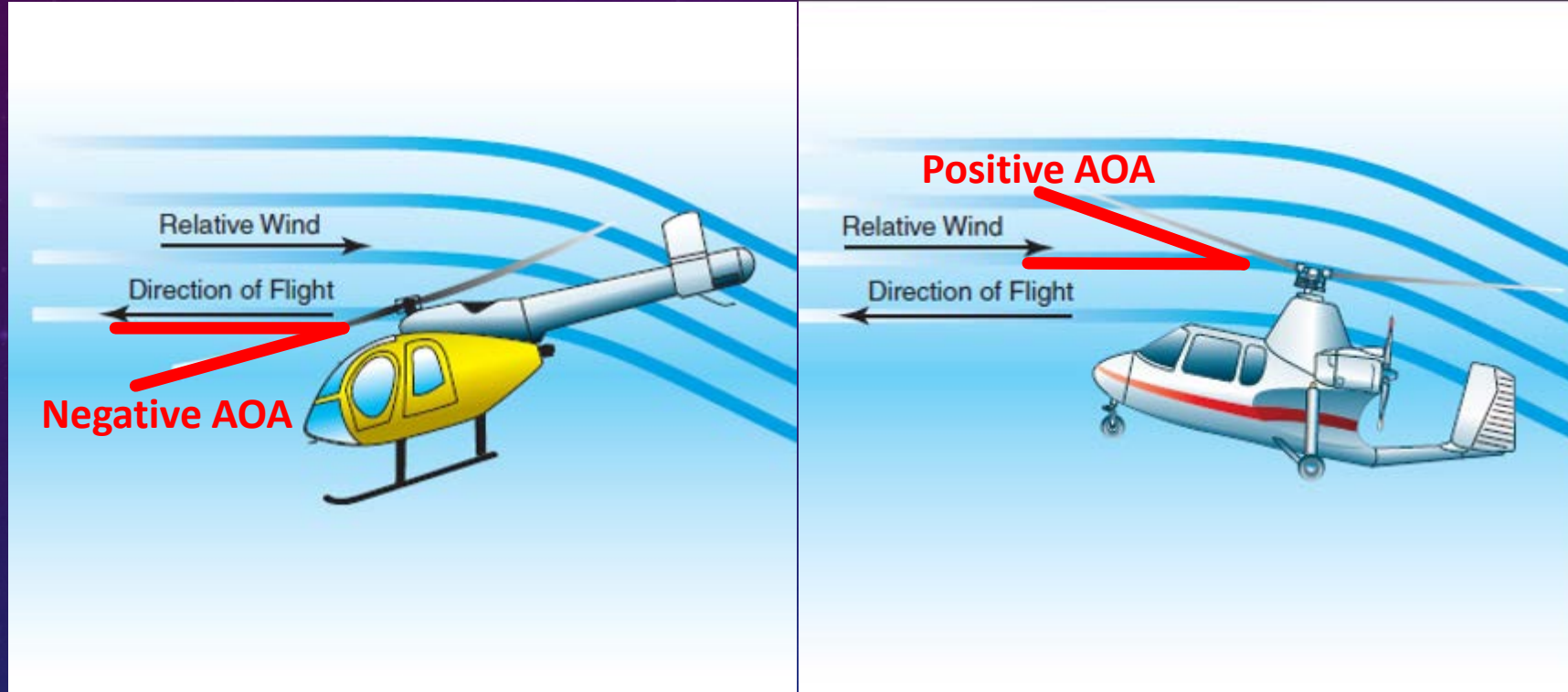


- **Helicopter:**
 - Rotor pulls the **helicopter** through the air
- **Gyroplane:**
 - pushes (or pulls) its **rotor** through the air





DID YOU KNOW...





DID YOU KNOW...

- Air flows **UP** through the rotor disc rather than **DOWN** from the rotor disk





DID YOU KNOW...

- Amateur-built or kit-built aircraft
 - Experimental category
 - Special Airworthiness Certificate
- FAA uses the term **gyroplane** for all autogyros, regardless of the type of Airworthiness Certificate

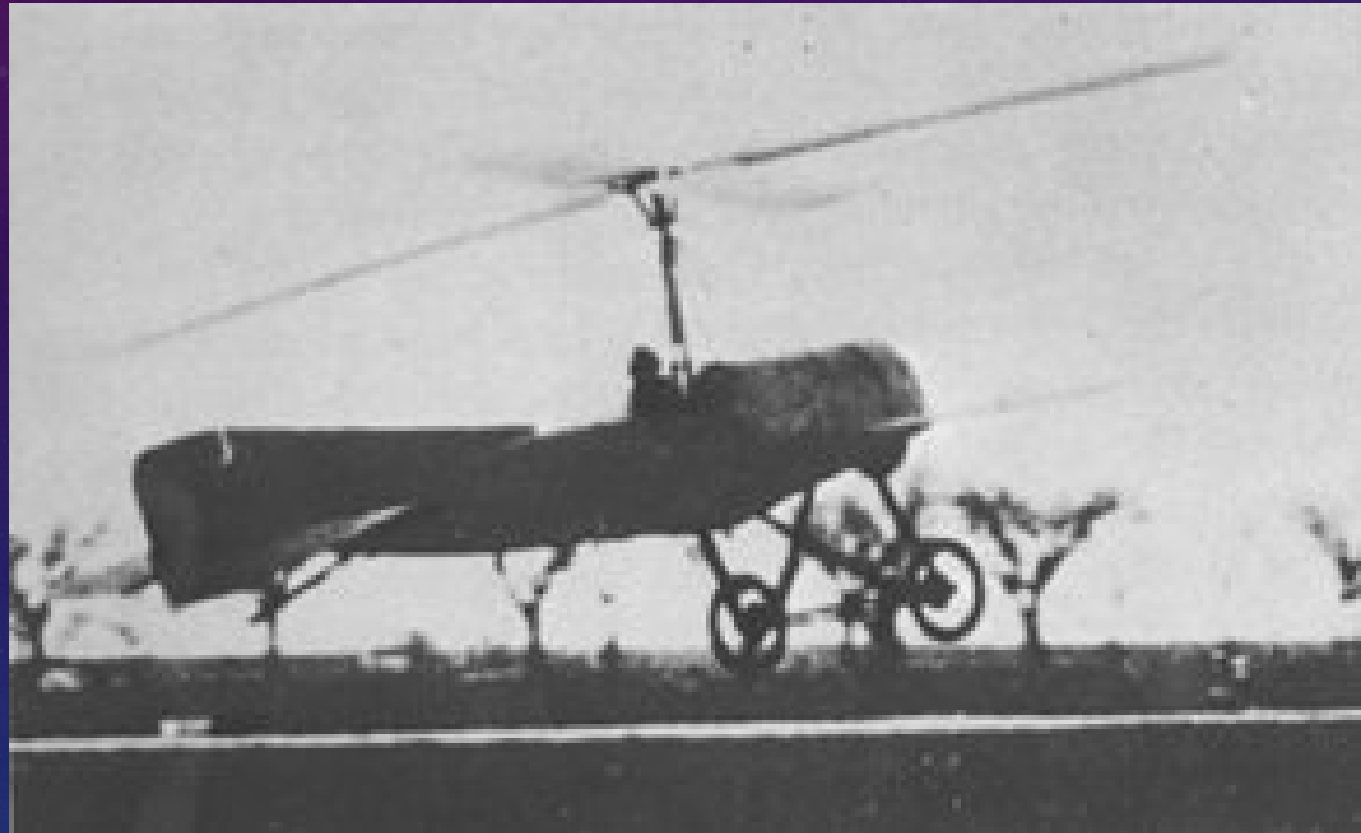


DID YOU KNOW...

- The autogyro was invented in the 1920s by Spanish engineer **Juan de la Cierva**
 - Attempted to create an aircraft that could fly safely at low speeds
- Cierva's autogyro is considered the predecessor of the modern helicopter



CIERVA: THE FIRST AUTOGYRO TO FLY SUCCESSFULLY IN 1923





PITCAIRN AUTOGYRO NC-12681

ST. HUBERT, QUEBEC, 8/19/1932





PITCAIRN AUTOGYRO PITCAIRN PA-22



Pitcairn (Autogyro Company of America) PA-22. Developed by Juan de la Cierva. Powered by a Pobjoy "Niagara" 90 hp radial engine. Seating for two. Gross weight was 1,140 pounds.



PITCAIRN AUTOGYRO

PITCAIRN PCA-2, 1931



EARLY BENSEN GYROCOPTERS

1950s – 1980s





GYROCOPTERS GET A BAD RAP



Bruce Spence with the wrecked early Bensen-style gyroplane from the movie Mad Max

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MCDONNELL XV-1 CONVERTIPLANE 1954

EXPERIMENTAL COMPOUND GYROPLANE

- Joint USAF-Army research program
- TO/LND like helicopter but fly faster like a conventional airplane
- 200 mph





Bensen Aircraft B8MG Gyroplane



Montgomery Merlin single-seat autogyro



Russian Smartflyer



GBA's Hawk 4 provided perimeter patrol during the 2002 Winter Olympics



Little Wing Autogyro



VPM M-16



MagniGyro M16
Altitude world record holder
8399 m = 27,555 ft



Super Genie Autogyro



**So, how do we get
the rotor turning
in the first place?**

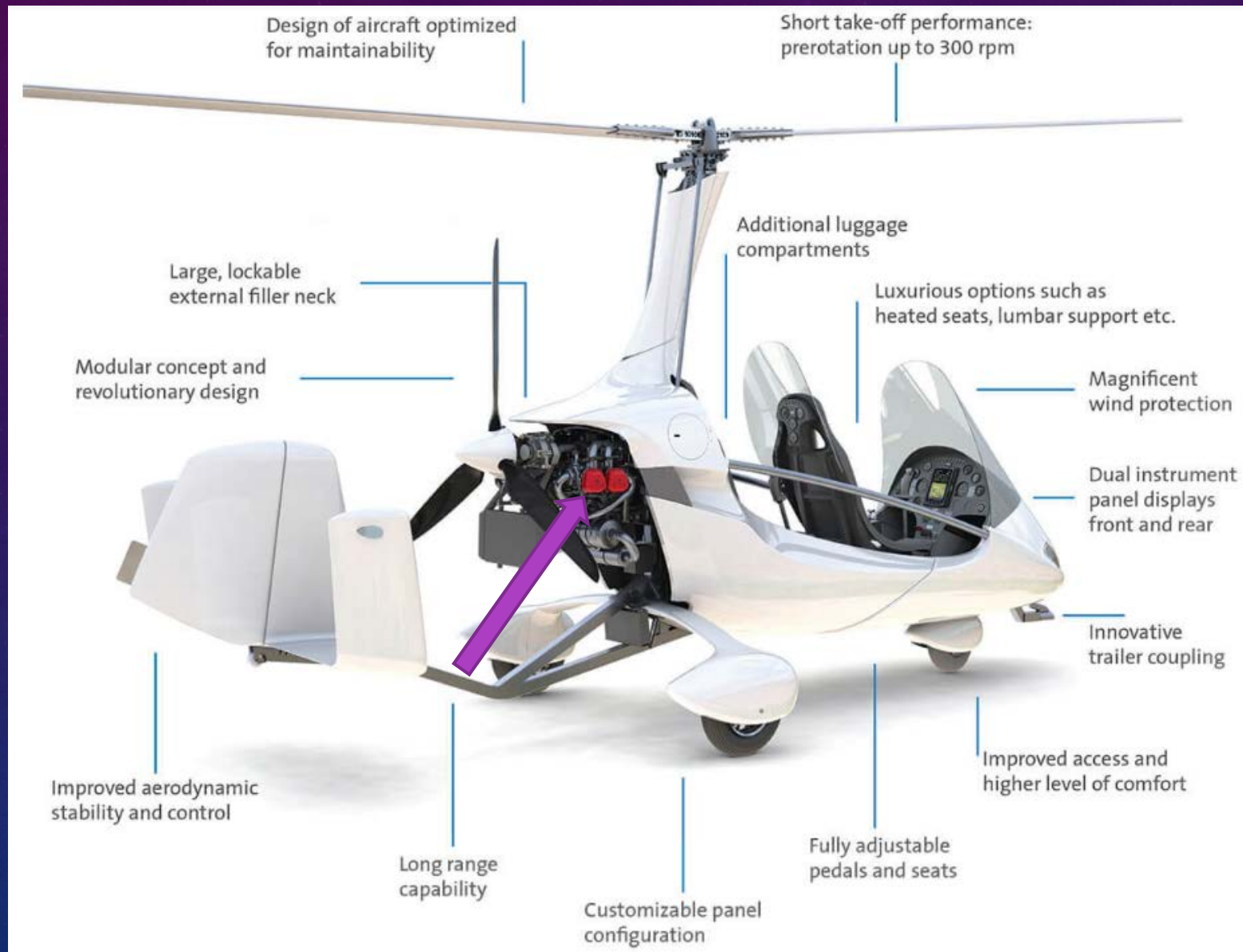


PRE-ROTATOR





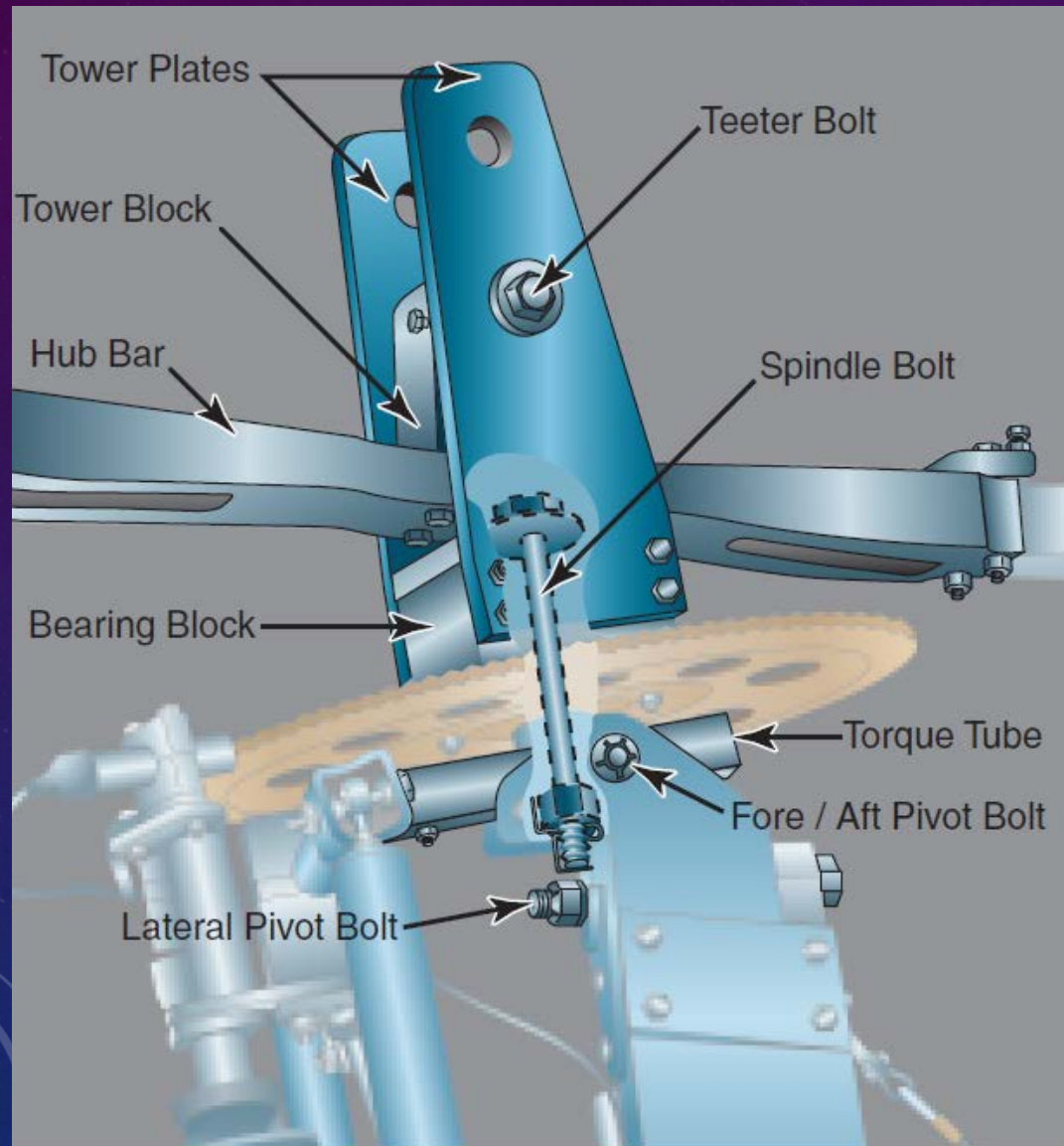
MODERN AUTOGYRO





MODERN AUTOGYRO

Semirigid Teeter-Head System



- Blades flap around the teetering bolt
- Blade AOA changes during flapping
- Blades “teeter to equality”



MODERN AUTOGYRO

MTO SPORT





MODERN AUTOGYRO

CAVALON



MODERN AUTOGYRO

CALIDUS



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January 2019





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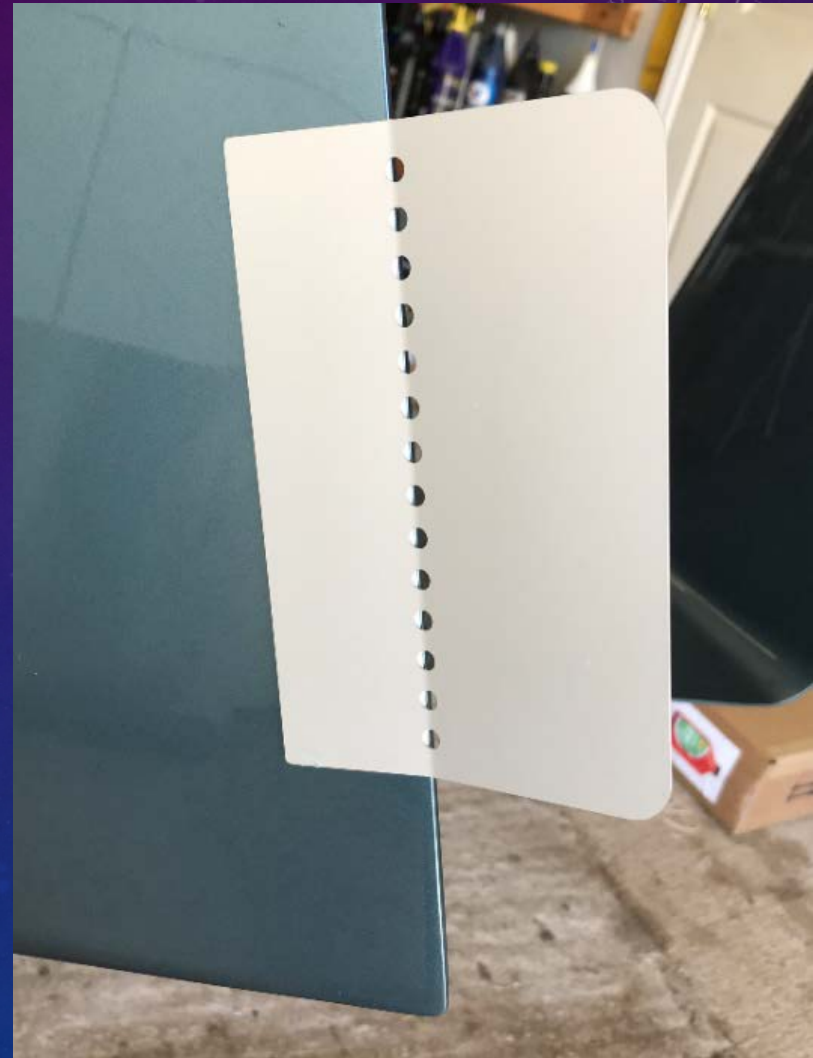
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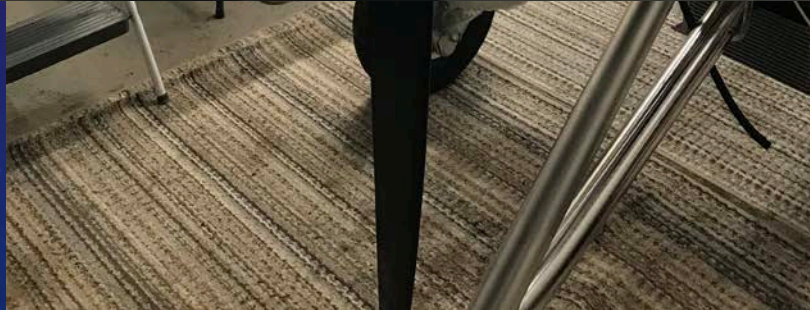
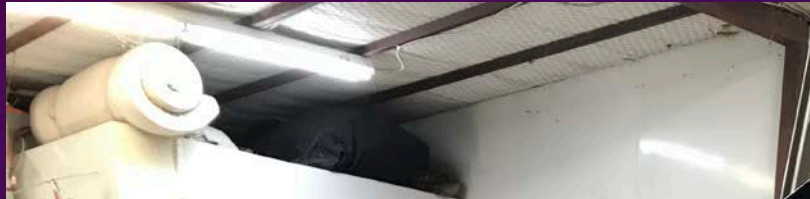
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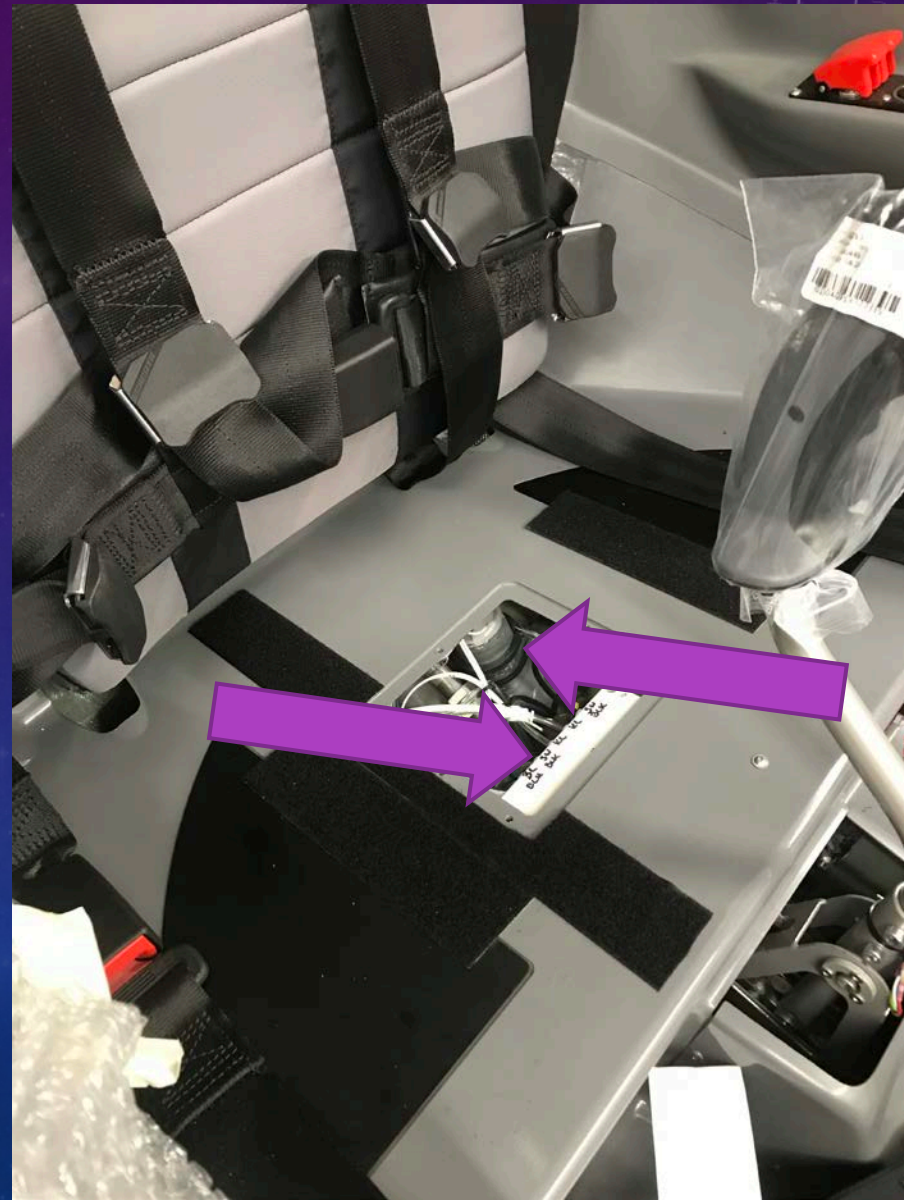
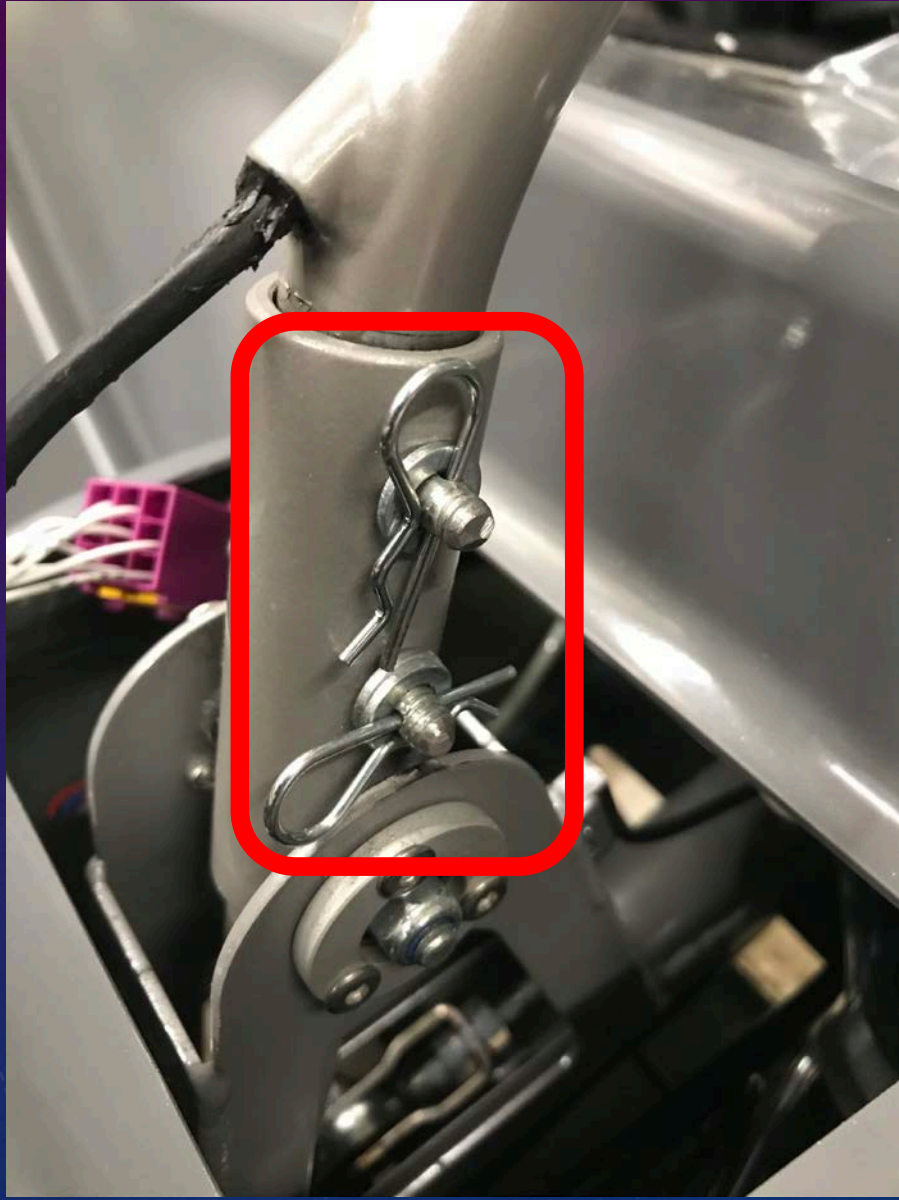


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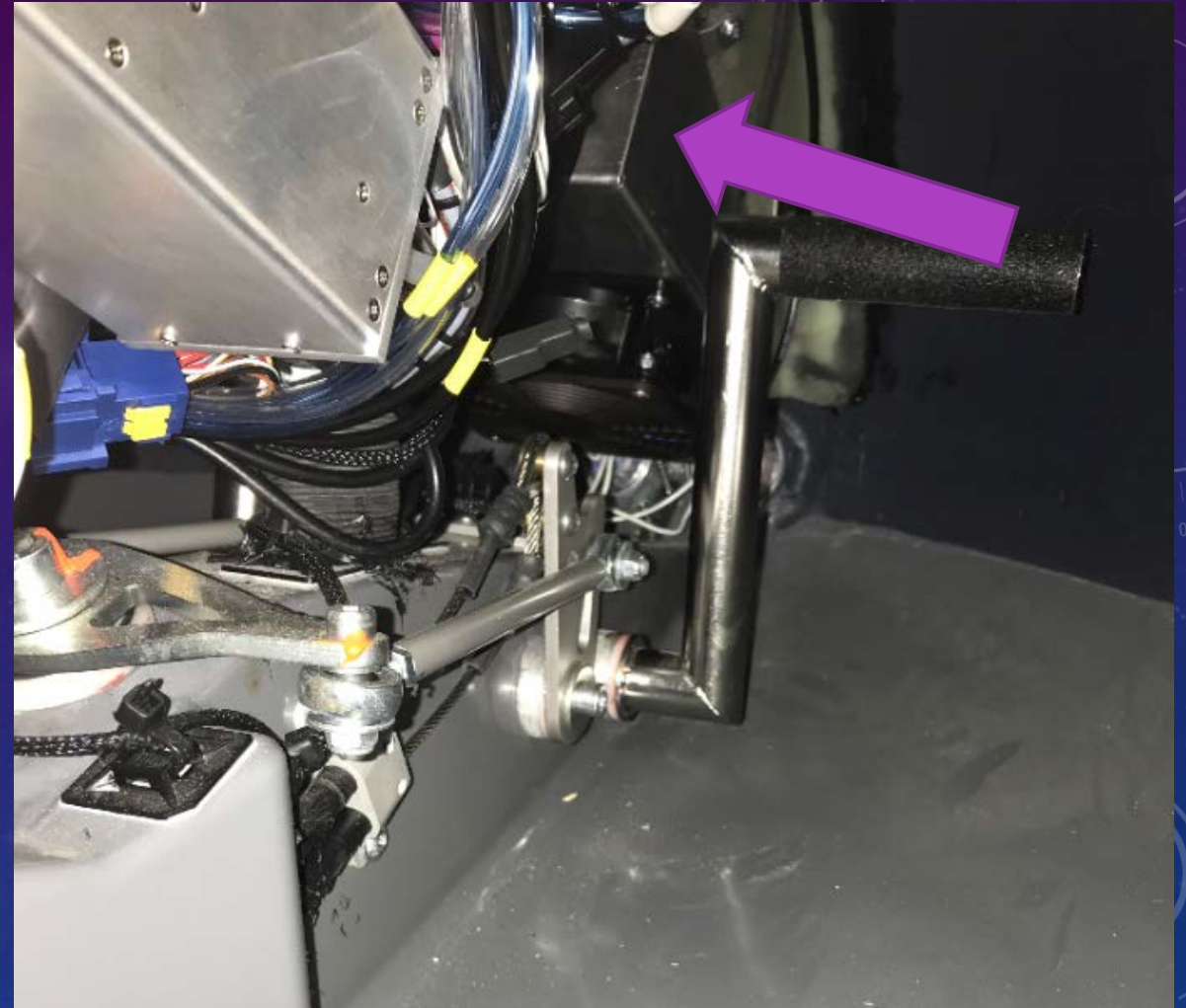


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1st Solo...





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The Specs

Technical Data	
L X1	
Eng	Engine: Rotax 914UL
MTC	
Eng	Takeoff Distance: 230 ft
Take	
Max	Max Endurance: 4.4 hrs
Max	
Max	Max Range: 326 nm
Cru	
Max	Cruise Speed: 86 kts
Fuel	
Con	Max Speed: 105 kts

*1 Rotax 915 IS subject to availability
*2 typical aircraft configuration, 1 pilot (175 lbs), 10 US gal fuel, 2000 ft MSL
*3 typical aircraft configuration, 1 pilot (175 lbs), max fuel, 2000 ft MSL

MTOW: 1234 lbs

EW: -651 lbs

Payload: 583 lbs

Fuel (19): -114 lbs

Pax/Bags: 469 lbs

THE MTO SPORT





CALIDUS: TOMBALL POLICE





For more information:

- www.autogyrousa.com
- **Craig McPherson**
 - **Blue Skies Gyros**
 - **817-517-3283**
 - www.blueskiesppc.com



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HANG ON... HERE WE GO.....





QUESTIONS?