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A New Era of Technology: How Drones are Changing the World as We Know It

What is a drone?

Drones are aircraft that can be operated without a human pilot on board. They can be controlled remotely, either by a ground-based pilot or through pre-programmed instructions. Drones come in a variety of sizes and shapes, ranging from small consumer models to large military drones. Over the years, drones have become increasingly popular. This growing demand has led to more companies implementing new designs and technologies in their drones to enhance their capabilities and functionalities.

Where are drones used?

Drones are used worldwide for various purposes. They are commonly employed in military operations, but also for scientific research, commercial applications, and recreational activities. Drones are particularly valuable in remote areas where conventional transportation is inadequate.

For example drones are being used all over in America by a company called, DroneSeed. This company uses drones to help them with **reforestation**. They use drones to survey the land, map out the planting sites, and then plant the seeds in the ground using a **pneumatic planting system**.

To plant these trees DroneSeed has created a new type of drone that can carry up to 300 seeds. By using drones, the company can plant trees in areas that are difficult or impossible to access by traditional means, such as steep slopes or remote areas. The use of drones can also significantly reduce the time and cost of reforestation efforts, making it a more scalable and cost-effective solution.

This is really important since we have seen an alarming increase in forests being burnt down. Usually this is fine, since this happens naturally, but deforestation has been more often than the forest making trees.



Figure 1: DroneSeed's new heavy duty tree seed planter. Can carry up to 300 seed pucks.

How does a drone work?

The main components of a drone are the airframe, which is the physical body of the drone, and the **propulsion system**, which includes the motors and propellers. The motors and propellers generate lift and thrust to keep the drone airborne and move it in different directions.

Drones also have sensors and a **flight controller**, which help them maintain stability and navigate in the air. The sensors can include **GPS, accelerometers, and gyroscopes**, which provide information about the drone's position, orientation, and movement. The flight controller processes this information and adjusts the motor speed and direction of the propellers to keep the drone stable and moving in the desired direction.

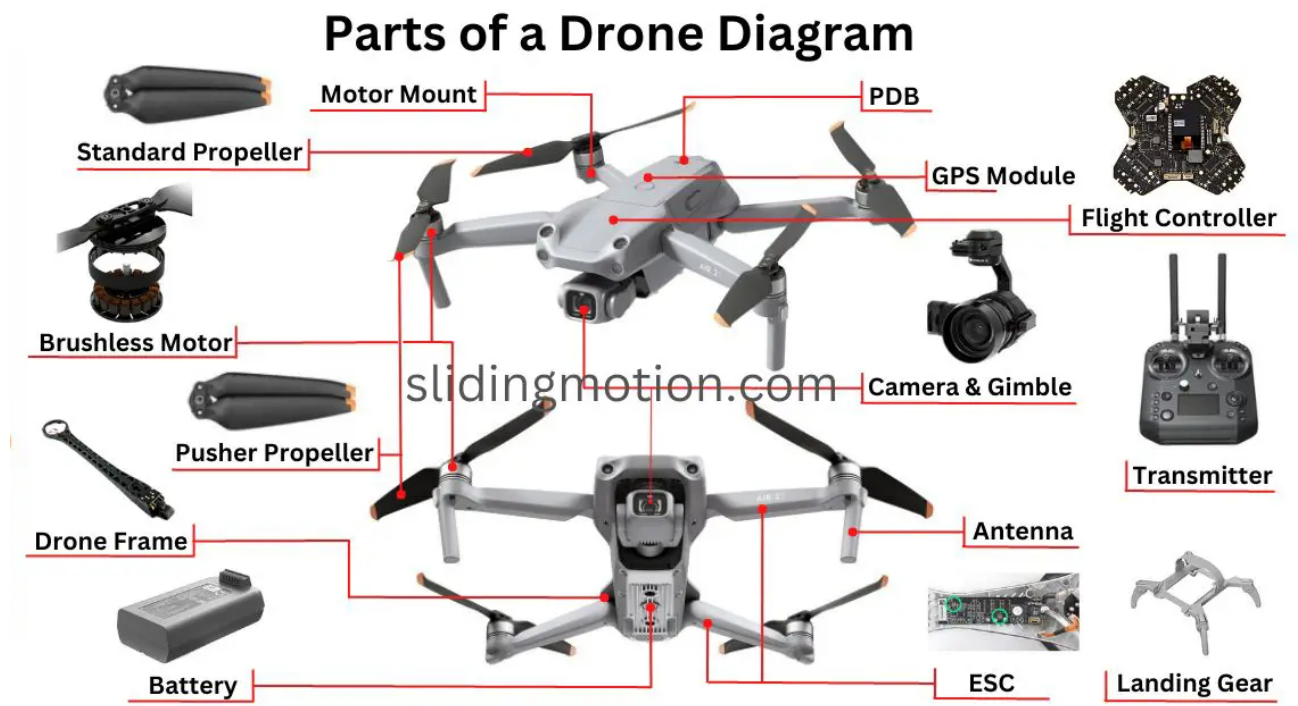


Figure 2: Parts that make up a drone.

Why are drones important?

The Zipline drones are important in Rwanda because they provide a reliable and efficient way to deliver medical supplies to remote and hard-to-reach areas. Rwanda is a country with challenging terrain and a **limited transportation infrastructure**, making it difficult to transport medical supplies quickly and safely. By using drones to deliver supplies, Zipline has helped to reduce delivery times from hours or even days to just minutes. This has made a significant difference in improving healthcare outcomes for people living in these areas, particularly for patients in need of urgent medical attention. Overall, the use of Zipline drones has demonstrated the potential for unmanned aerial vehicles to address some of the biggest challenges facing healthcare systems in **low-resource settings**.

Furthermore, drones have significant potential for commercial use. Consider when you order food delivery from UberEats or purchase products from Amazon. These companies currently rely on large delivery trucks and significant manpower to transport goods to consumers. However, the use of drones for delivery could significantly reduce traffic on roads, carbon emissions, and the need for additional manpower. This could lead to a more efficient and sustainable method of delivery in the future.



Figure 3: Zipline's secondary drone is launched to drop desired packages with dinner plate accuracy.



Figure 4: The new propeller design created by Zipline for commercial use. This drone will be the main drone, it will stay above the ground by 400 feet. After reaching its desired location It will lower the second drone (Figure 3).

As Aryn Baker said, “Before, it took at least three hours to get blood in an emergency,” says Dr. Roger Nyonzima, head surgeon at Nyanza Hospital’s maternity ward, which is about 60 miles from Kigali. “Three hours can make the difference between saving or losing a life. Now we get blood in 15 minutes. Fifteen minutes, we can work with.”(Baker, A. 2018).



Figure 5: Zipline drones can go up to 50 miles per hour and travel a distance up to 100 miles.

With the help of their drone launcher the drones start their travel.k

History of drones

1917-1918: The US military develops unmanned aircraft, known as "aerial torpedoes," to target

German forces in World War I

1930s: The British develop the Queen Bee, a radio-controlled target drone for anti-aircraft

gunnery practice

1959: The US Navy develops the Kettering Bug, a flying bomb that could be guided to its target using pre-set controls

1960s-1980s: The US military develops a variety of drones for reconnaissance and surveillance, including the Ryan Model 147, the Predator, and the Global Hawk

1980s-2000s: Drones are increasingly used for civilian purposes, including aerial photography, crop monitoring, and search and rescue operations

2001: The US military begins using armed drones, including the Predator, in combat operations in Afghanistan

2010s: The use of drones becomes increasingly popular among hobbyists, leading to regulatory challenges and safety concerns

2016: The FAA releases rules for commercial drone use, requiring pilots to obtain a license and follow certain safety regulations

2018: DJI, the world's largest drone manufacturer, unveils a drone with a 30-minute flight time and a 4K camera for under \$500

2019: Drones are used to deliver medical supplies and blood samples in Rwanda and Ghana, respectively

2020: The COVID-19 pandemic leads to increased use of drones for contactless delivery and monitoring of public spaces

2021: NASA successfully tests an autonomous drone air traffic control system to manage low-altitude drone traffic in urban areas

Fun Facts

1. The world's largest drone is the Ravn X, which has a wingspan of 80 feet and can fly for up to 24 hours.
2. The world's first drone taxi service was launched in Dubai in 2017, with passengers able to book a flight using a smartphone app.
3. In 2018, Intel set a world record for the most drones flown simultaneously, with 1,218 drones flying in formation to create a light show in California.
4. In 2020, a drone helped save the life of a swimmer who was being carried out to sea by a rip tide off the coast of Australia, dropping a flotation device to the struggling swimmer until rescuers could arrive.



Figure 6: The world's largest drone is the Ravn X, 80 feet long!

<https://www.cnet.com/tech/computing/new-zipline-drone-brings-aerial-delivery-closer-for-millions-more-of-us/>