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THE FUTURE DRONES

PHANTOM RAY

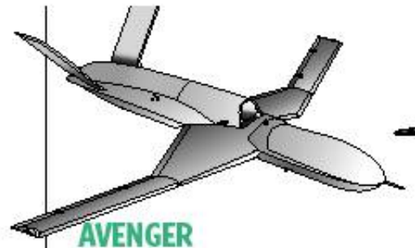
This jet-powered flying wing has advanced UAV technologies, like radar jamming, autonomous aerial refuelling, air-missile defence and surveillance. It flies up to 40,000 ft. With a speed of 610 mph, this will be one of the fastest UAVs on record

VULTURE

A belt of relatively calm air around 55,000 ft. A suite of day-&-night cameras can scan a 600-mile swath, sending data back to handlers on the ground. The craft's semiflexible structure bends instead of breaking when winds cause the long span to oscillate violently

EMBLA

A Hovercraft which lifts straight up from the ground with no runway. Will be useful for soldiers in rough terrain. Loaded with explosives, it could even enter an enemy compound on a suicide mission

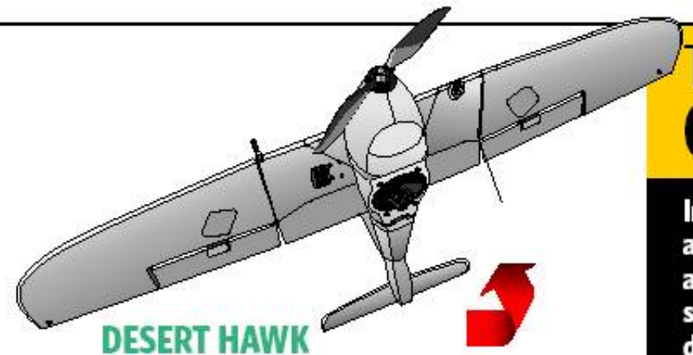


AVENGER

This hunt-and-kill device is packed with 3,000 pounds of surveillance equipment and lethal munitions. It can fly at speeds up to 530 mph, can loiter for nearly 20 hours and has wide-area surveillance sensors

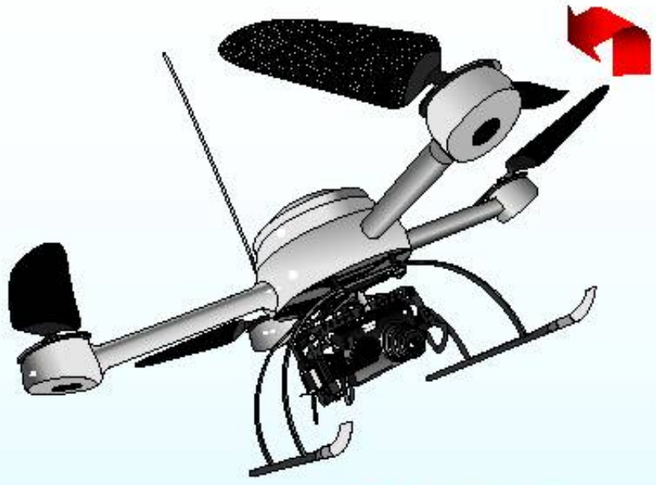
BOEING HALE

Seven tons, 250-foot wingspan. At 65,000 feet above future battle fields, it will provide 24/7 surveillance and data communication. The plane can stay up for 10 days and runs on hydrogen fuel



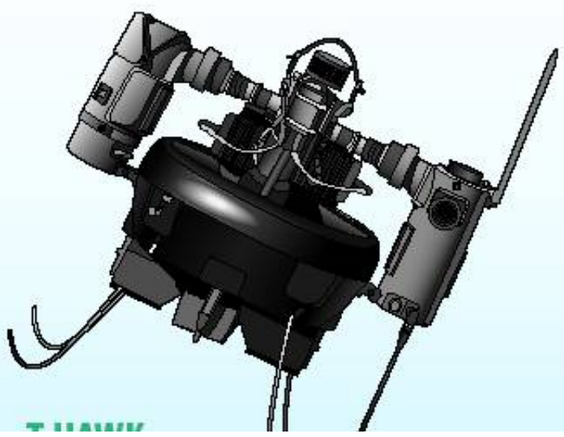
DESERT HAWK

Once it's chucked in the air, Desert Hawk coordinates to give British and American troops in Afghanistan an "over-the-hill" view, day or night, up to 6 miles away. At two pounds (with a collapsible 4.5-foot wingspan), it's easy to transport. Desert Hawk is as durable as a Nerf



MD-4 200

Used in Liverpool, UK, where it's flown by officers of the Mersyside police department's Anti-social Behaviour Task Force. The four-rotor design of the battery-powered, carbon-fibre pod, which weighs just 1 kg, allows it to take off and land vertically. Brushless, direct-drive electric motors keep the noise level below 64 decibels, according to the company. The most significant and notable feature is that if it loses signal or senses a low battery, it will land itself automatically rather than crash



T-HAWK

RQ-7 SHADOW

Flown in Iraq and Afghanistan, where army battalions need tactical surveillance. It has flown hundreds of thousands of hours. It launches from a catapult, can stay aloft for five to six hours up to 14,000 feet, and lands

THE INDIAN CONNECTION

India has embarked on developing an indigenous unmanned combat aerial vehicle (UCAV) for surveillance, detection and destroying specific targets

NETRA

Drone of '3 Idiots' could now serve Army

This machine is the same as the one built by IdeaForge, a company founded by three IIT, Bombay alumni **Ankit Mehta, Rahul Singh and Ashish Bhat.** DRDO has tied up with IdeaForge to refine the UAV now named Netra. Used by the Indian army and National Security Guard (NSG), for reconnaissance in anti-terror ops, it is noiseless, has daylight and thermal cameras and a low battery fail-safe

T-HAWK

This is mostly used by the US army's infantry divisions in Iraq. It looks like a mini grill with four coat-hangers for landing skids. The VTOL T-Hawk can zip up to 10,000 feet for up to 45 minutes. At just 16.5 pounds, its very much backpackable

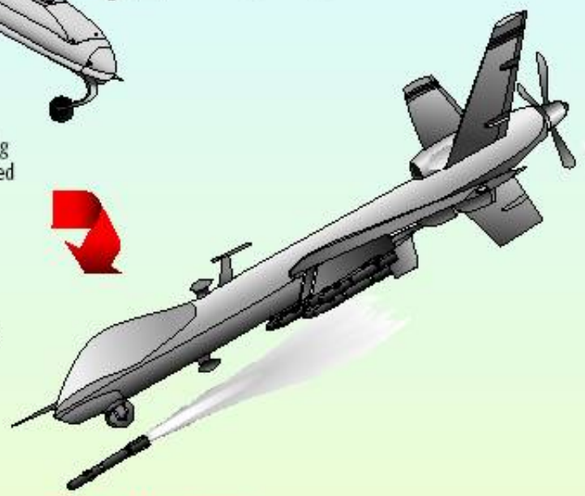
AEROSONDE

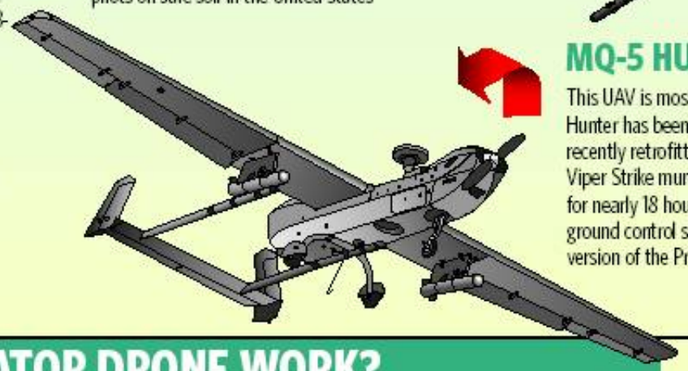
This one is perfect for stormy seas, or any other inhospitable or inaccessible spot that researchers want to study up close. This was the first UAV to cross the Atlantic Ocean back in 1998 when the 9.8-foot, 28-pound research craft could fly up to 30 hours on a single tank of gas. In 2007, it delivered unprecedented weather readings from Hurricane Noel, loitering as low as 300 feet above the surface, and streaming data for more than seven hours at a stretch before it was ditched in the ocean. The most distinct feature is that it has an inverted V tail which combines functions of what would be the horizontal and vertical parts of the tail wing, which saves weight. Power: One horsepower

autonomously on wheels, with the help of a net. It's a little more than 11 feet long, weighs 375 pounds and has a wingspan of 14 feet. With its infrared illuminator, it can laser-pinpoint targets for guided missiles and bombs.

MQ-9 REAPER

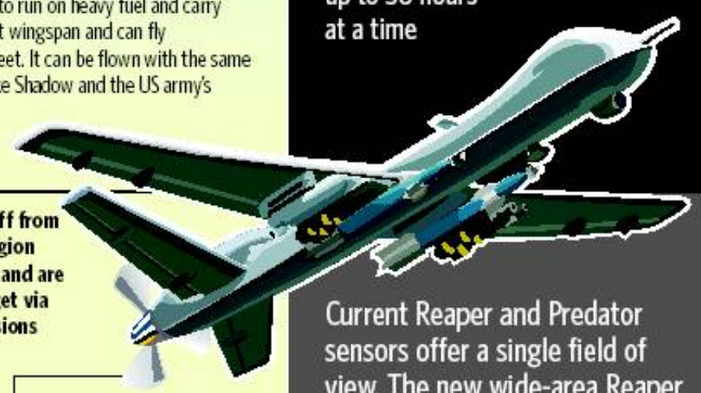
This is currently used for the purpose of hunting and killing insurgents in Iraq, Afghanistan, and Pakistan. It's being used for patrolling the United States-Mexico border out of Fort Huachuca, Arizona. With a wingspan of 66 feet, it's twice the size of its precursor MQ-1 Predator, and can loiter at 5,000 feet for up to 24 hours. It's loaded with 3,000 pounds of munitions, including the GBU-12 laser-guided bomb and Hellfire tank-penetrating missiles. Military commanders say it has become one of their most effective weapons in the current war. After being launched by operators using radio-control equipment, the MQ-9 Reaper is flown via satellite link from pilots on safe soil in the United States





MQ-5 HUNTER

This UAV is mostly flown by the Army in Iraq and Afghanistan. The Hunter has been in service since just before the Balkans war, and was recently retrofitted in the MQ variant to run on heavy fuel and carry Viper Strike munitions. It has a 34-foot wingspan and can fly for nearly 18 hours, at nearly 18,000 feet. It can be flown with the same ground control station as the UAV's like Shadow and the US army's version of the Predator



DRDO RUSTOM 2

India's own predator. The unmanned aerial vehicle is scheduled to take to the skies within three years and replace the Israeli Heron

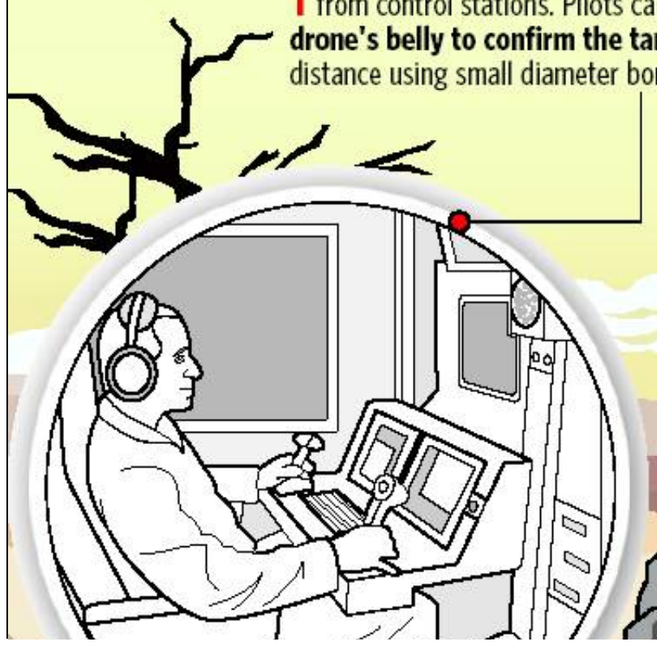
It can be used for long-endurance surveillance, reconnaissance over oceans and gathering intelligence over Naxal areas. The Heron is similar to the US Predator and can stay in the air up to 50 hours at a time

Current Reaper and Predator sensors offer a single field of view. The new wide-area Reaper will record video from 12 cameras simultaneously. India activated its first UAV maritime reconnaissance squadron over a year ago

GRAPHIC: PRANJOLI DAS MUKHERJEE & ILLUSTRATIONS: PRANJOLI, SACHIN

HOW DOES A PREDATOR DRONE WORK?

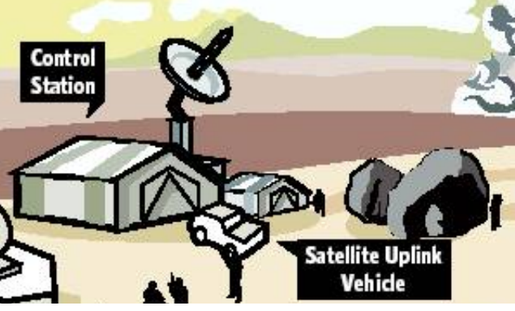
1 **Target information is given to pilots**, who can operate the drones from control stations. Pilots can use **video and other sensors on the drone's belly to confirm the target**. The drones can strike from a distance using small diameter bombs or laser guided missiles



2 SATELLITE RELAY

Communication satellites are used to control the predator when there is no direct link available. They also transfer data back to other military facilities

The drones take off from air bases in the region around the target and are guided to the target via satellite transmissions



3 PREDATOR

3 DRONE

An aperture camera used for navigation, infrared camera and radar allow surveillance at night and through haze, clouds or smoke