IT'S A BIRD IT'S A PLANE

By Kyle Ross
THE BATTALION

It would seem the researchers at NASA are always up to something. Although recently, they may have figured out a new way to keep something up. A team of scientists at the NASA Dryden Flight Research Center has developed a way to power aircrafts with an invisible ground-based laser, enabling planes to stay in flight for extended periods of time.

The birth and evolution of the powered aircraft have changed the world, and just like any other greatly utilized technology, with each new step came the desire for the next.

Almost a century ago in December 1903, Orville and Wilbur Wright accomplished the unthinkable. They designed and constructed the world's first powered "flying machine." Upon manned flight, they marked the first time that a machine under the control of a pilot had gone airborne, sustained flight and safely returned to the ground.

Mankind was never the same. Man had taken to the skies, and eventually, powered flight was a mainstay for the military and commercial industry. Obviously to stay aloft, airplanes, as they came to be called, needed some sort of energy source such as fuel, batteries or solar panels.

The problem with these forms of energy is that they constantly need to be replenished. But Alan Brown, a member of the NASA research team, describes laser-powered flight in a way that suggests the days of refueling may someday end.

"It's like an extension cord in the sky," Brown said. "The plane will fly for as long as the laser is illuminating the photovoltaic panel with energy. There is no limitation on how long the plane can fly."

The plane has an electric motor, and a photovoltaic panel is directly connected to it. A laser beam with enough intensity and correct wavelength is directed towards the photovoltaic panel as the plane is in flight. The light energy from the laser is converted into electrical power, and that power is used to run the motor.

"If the laser is removed from the panel, the motor will stop providing thrust, and the plane will glide to the ground," Brown said. "Actual experience was that the plane was flown until the operator tracking (pointing) the laser at the plane got too tired to continue and called for the flight to end."

At this point, NASA has only built and tested a small-scale prototype aircraft. It has a wingspan of five feet, and including the photovoltaic panel, weighs about 11 ounces. During testing, the plane was hand-launched from a height above the ground inside a large building. It successfully flew in tight circles before gliding down to a triumphant landing.

"The reason the plane was built that way was to give the greatest performance margin and require the least amount of energy to fly," Brown said. "Now that we have successfully flown the plane with the laser, we can build a more capable plane to fly outside at greater distances and for longer periods."

If successful, this technology could lead to a revolution in the telecommunications industry and become an asset to the military. Theoretically, flight-sustaining aircraft could be flown over cities, effectively replacing the use of space-orbiting satellites. Cell phone signals, as well as television and Internet connections, could be fed directly from transponders attached to the plane. The laser-powered aircraft would also excel as spy or communication planes for military purposes. Brown said he even envisions the use of laser-powered aircrafts on Mars.

"An orbiting satellite with sufficient power could beam energy to an airplane flying in Mars' atmosphere on every orbit to top off its energy storage system and thereby have the airplane fly for days or longer," Brown said. "Even robots on the surface could get power from the orbiting spacecraft and do more than would be possible with solar panels only."

But the development of this technology is still very young. And while it has raised eyebrows around the country, some say they will believe it when they see it.

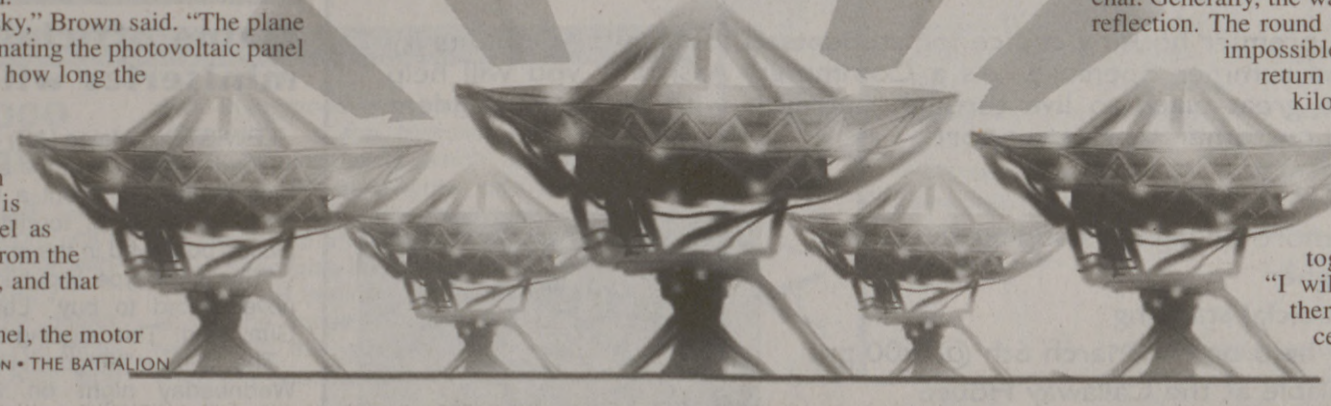
"This technology might work on a real plane as an alternative power source, similar to ideas developed for the hybrid cars," said Dimitris Lagoudas, a professor of aerospace engineering and director of the Center of Mechanics and Composites. "But one of the biggest challenges I believe is the transmission of laser power with enough accuracy to always find the receiving photovoltaic panel."

Kyle T. Alfriend, a professor of aerospace engineering and holder of the Wisenbaker II Chair in Engineering, shares Lagoudas' concerns.

"The pointing accuracy (of the laser) would have to be phenomenal. Generally, the way we acquire a target with a laser is with the reflection. The round trip time of a signal would make it virtually impossible to acquire the target. By the time you get the return signal, the plane would have moved a few kilometers."

Despite the challenges that lay ahead, NASA is confident in its accomplishment.

"The challenges of this project were really of integration — how to put it all together and make it work safely," Brown said. "I will say that I believe all the technology is there, it just needs to be put together in a successful way."



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