

6.27.2006

Give the Gift of Popular Science Magazine

> S

Popsci.com:

- Home
- What's New
- How2.0
- Computers & Elec.
- Science
- Aviation & Space**
- Automotive Tech
- Technology
- Medicine

Magazine:

- Current Issue
- PopSci Store
- Subscribe
- Digital Edition
- Customer Service
- Gift Subscription

Resources:

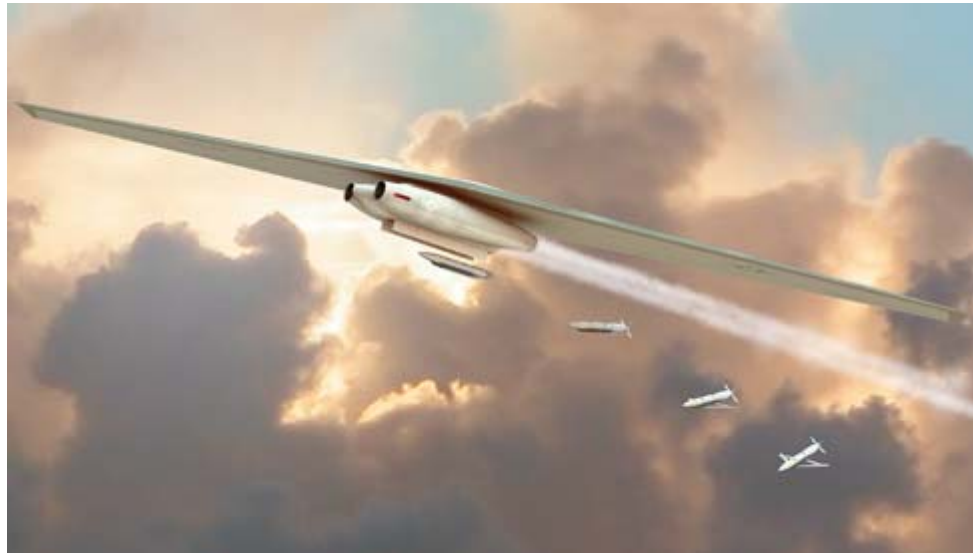
- Contact Us
- PS Showcase
- Media Kit
- RSS

Newsletter:

Enter e-mail address to receive popsci weekly updates to your inbox.

 include web results

Aviation & Space



John MacNeill

The unmanned Switchblade may use Small Diameter Bombs, whose wings unfold upon deployment to increase their range.

The Supersonic Shape-Shifting Bomber

With a shift of its wing, the Pentagon's next attack drone goes from long-range endurance flyer to Mach-speed assassin

By Noah Shachtman | July 2006



John MacNeill

As the plane approaches the sound barrier, its wing pivots into an oblique configuration to maximize aerodynamic efficiency at supersonic speeds.

[+ Enlarge this image](#)[Go to Forums](#)[Print This Article](#)

For years, the U.S. military has wanted a plane that could loiter just outside enemy territory for more than a dozen hours and, on command, hurtle toward a target faster than the speed of sound. And then level it. But aircraft that excel at subsonic flight are inefficient at Mach speeds, and vice versa. The answer is Switchblade, an unmanned, shape-changing plane concept under development by Northrop Grumman.

When completed (target date: 2020), it will cruise with its 200-foot-long wing perpendicular to its engines like a normal airplane. But just before the craft breaks the sound barrier, its single wing will swivel around 60 degrees (hence the name) so that one end points forward and the other back. This oblique configuration redistributes the shock waves that pile up in front of a plane at Mach speeds and cause drag. When the Switchblade returns to subsonic speeds, the wing will rotate back to perpendicular.

Archived Art

- See all Aviation
- PopSci Complet
- Free Digital Iss

Darpa, the Pentagon's way-out research arm, has coughed up \$10.3 million to Northrop Grumman to produce a detailed blueprint by November 2007. A flying test vehicle is due about four years later. The initial concept calls for a single wing with engines situated in a pod underneath, along with munitions and surveillance equipment. This setup will enable the wing to pivot while the engines remain pointed in the direction the craft is traveling.



John MacNeill

With its long, thin wing in a standard configuration, the Switchblade can maintain subsonic-speeds for at least 15 hours as it waits for a mission.

This is not the first attempt at an oblique-wing aircraft. SpaceShipOne creator Burt Rutan designed a switch-wing plane with NASA in 1979. But the slanted wings made the craft hard to fly—when the pilot pulled the nose up, the plane would roll to one side.

The Switchblade, however, is a good candidate to be an unmanned aerial vehicle (UAV). The artificial intelligence used to control UAVs can handle the tricky flight dynamics, and a computer pilot doesn't need to eat, rest, or go to the bathroom—useful for those 15-plus-hour missions.

If all goes well, Darpa says, a 40-foot-wingspan demonstration model could be ready by 2010, and a full-size Switchblade should be all set for a brawl by 2020.



John MacNeill

With its wing cocked forward, the Switchblade flies at Mach 2 toward a target up to 2,500 nautical miles away.

Switchblade

- Objective:** To function efficiently as both an endurance aircraft and as a supersonic airplane by changing its shape midflight
- Time Frame:** Design by 2007; one-fifth-scale technology demonstration vehicle by 2010; ready for service as early as 2020
- Wingspan:** 200 feet
- Range:** 5,000 nautical miles
- Max. Altitude:** 60,000 feet
- Max. Speed:** Mach 2

Related:

In fact, invest billion busine BP Alte Energy

Because reduce emissi future, believe need to alterna

Disco



with auto

Name

Address

City

ST/Provin

Zip/Posta

E-mail

CONTIN

advertisement

POPULAR SCIENCE THE FUTURE NOW

DIGITAL VERSION

Instant Access • Easy to Use
Searchable • Sharable

12 issues for \$9.99
SAVE 79%

The advertisement features a laptop displaying the digital version of Popular Science magazine. The magazine cover shows a red and white racing car. The text is in bold, red and white colors.

Top 5 Most Popular Articles on popsci.com Today:

1. The Supersonic Shape-Shifting Bomber
2. Diesel Wins Respect
3. Build a Backyard Theater
4. The iPod's New Bag of Tricks
5. Mining the Moon

Subscribe



12 ISSUES FOR \$12

75% Off Cover Price

with automatic renewal

Name:	Address:
City:	-- <input type="button" value="v"/>
Zp/Pst	E-mail:

CONTINUE

THE MARKETPLACE SPONSORED LINKS

Lenovo June Promo!

\$100-\$200 mail-in rebates on new Lenovo 3000 notebooks and desktops

Chevron Energy Debate: Will You Join Us

Get information about energy and environmental issues in our world today. Chevron invites you to join an online discussion about some of the energy i...

Save on Laptops and Plasma, LCD & Projection TVs

Browse our selection of Plasma, LCD and Projection TVs. We have great prices and we deliver! We've got the largest selection of Notebooks and Tablet ...

Great prices and service on Laptops, TVs & more!

Looking for a Plasma TV, LCD or Projection TV? You have come to the right place. We offer low prices, fast and friendly service. Our selection of Not...

Promotional USB Flash Drives and MP3 Players

Customized USB Flash Drives and MP3 Players with your company logo for promotional giveaways. 64MB USB Flash Drive only \$12.00. Free Custom Logo, Fast...

Buy a link Now

[Customer Service](#)

Copyright © 2005 Popular Science

