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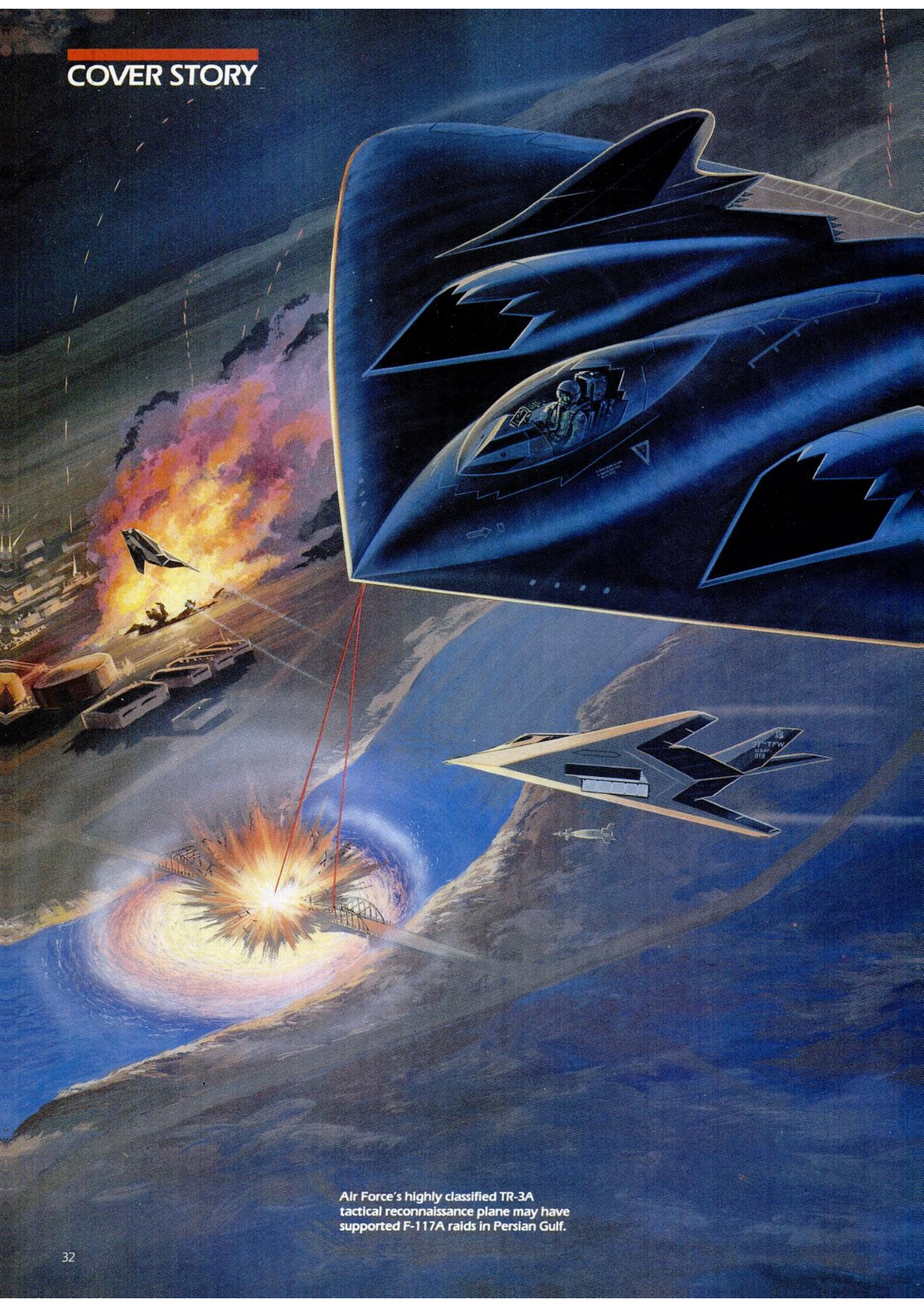
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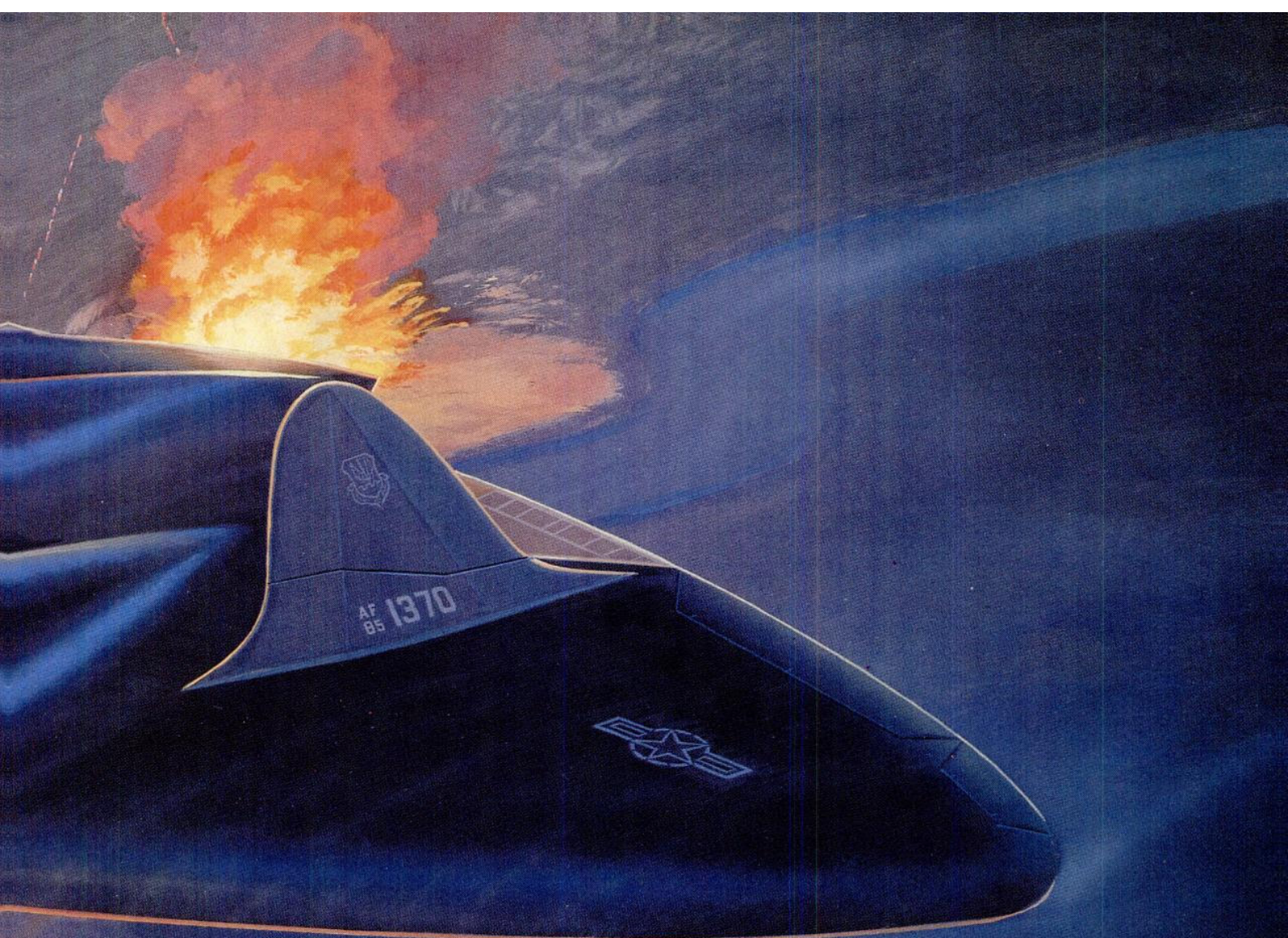
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Air Force's highly classified TR-3A tactical reconnaissance plane may have supported F-117A raids in Persian Gulf.



AMERICA'S NEW SECRET AIRCRAFT

Bizarre aircraft glimpsed in California's desert skies may herald a new generation of American air power.

BY GREGORY T. POPE; PM Illustrations by Mark McCandlish

● At midnight, traffic along Highway 138 has all but died. The Moon has yet to emerge, but stars shed enough light to silhouette the Joshua trees that dot the desert and the Tehachapi Mountains that rise to the north. Twenty miles to the southeast, the city lights of Lancaster throw a faint orange tint on a corner of the sky. Grasshoppers wheeze, pocket mice scuffle in the sand, a faded ranch sign creaks in the wind—otherwise, it is silent.

On nights like this, men and women have stood here and stared at the sky, looking for aircraft that officially don't exist. Some watchers spend the night and leave unrewarded. But others tell stories of lights that streak and maneuver across the heavens at impossible speeds, or triangular shapes that prowl silently overhead.

This corner of California's high desert, known as An-

telope Valley, has long served as a testing ground for ultraclassified, or "black," aircraft—from the P-59 Airacomet, America's first jet, to the F-117A Stealth fighter. Not only does the valley host Edwards Air Force Base, Air Force Plant #42 and associated contractor facilities, but test-flight paths from nearby China Lake Naval Weapon Center and the Air Force's Nellis Air Range in Nevada bring aircraft through restricted airspace into Antelope Valley.

But secrets stay closely held here. Those who know won't break their security vows. Those who think they've glimpsed the truth in the dark skies spoke anonymously to *POPULAR MECHANICS*, fearing reprisal in an area where the aerospace industry dominates employment. In the words of one local journalist, chasing secret activity "is like trying to catch smoke in a bottle."

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It's no secret, however, that in the past decade the Department of Defense has poured money into "black" programs. The Air Force alone has spent nearly \$46 billion on classified weapons procurement over the past five years, and another \$20.3 billion in classified research and development, according to an analysis by the Defense Budget Project, a nonprofit organization in Washington, D.C.

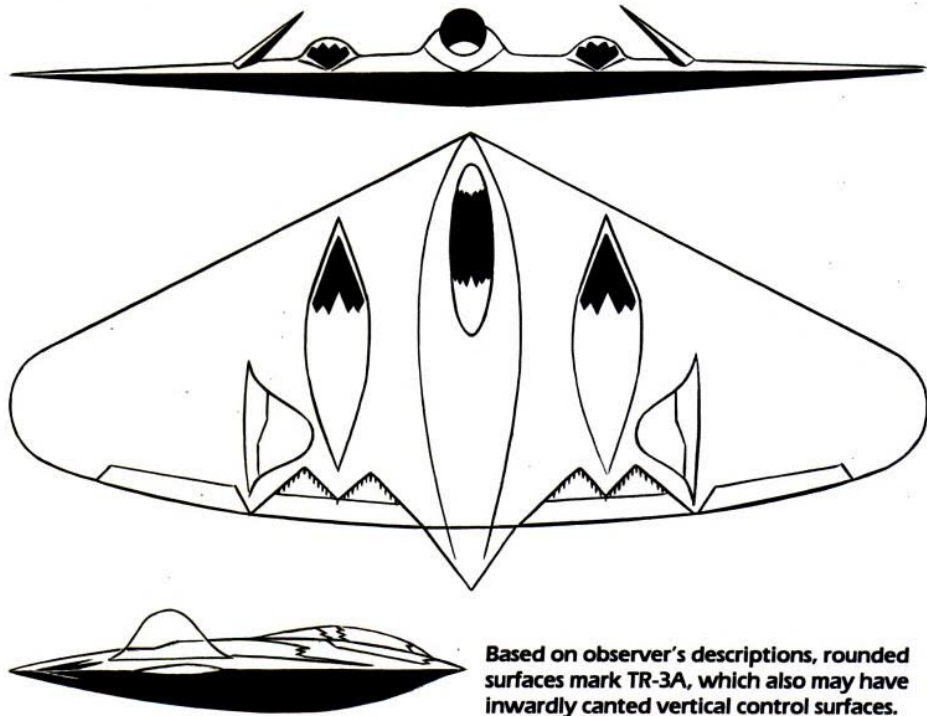
But tracing the flow of classified funds from the Pentagon to contractors reveals little about hardware. Eyewitness reports, even from unqualified observers, tell more. And a nagging consistency ties together accounts from individual eyewitnesses and lends credibility to their claims.

The vehicles in such anecdotes fall into three categories. First, observers have reported several different triangular aircraft with wingspans ranging from roughly 60 to 160 ft. Second, witnesses have described a high-speed, high-altitude vehicle, seen only as a yellow or orange light with a related pulsing engine roar. Finally, a black, silent, boomerang-shaped vehicle that stretches between 600 and 800 ft. across and performs circus-pony maneuvers at airspeeds as low as 20 knots. Asked to comment, Air Force Systems Command referred the inquiry to a Pentagon-based public affairs officer, Capt. Betsy Freeman, who issued this statement: "We have no aircraft matching these descriptions."

Black wings

Reports of the triangular planes come from the best-qualified eyewitnesses. Indeed, the journal *Aviation Week & Space Technology* asserts that one of these aircraft is the Northrop TR-3A, a classified tactical reconnaissance vehicle.

This plane, about 42 ft. long and 60 to 65 ft. in wingspan, appears to fly



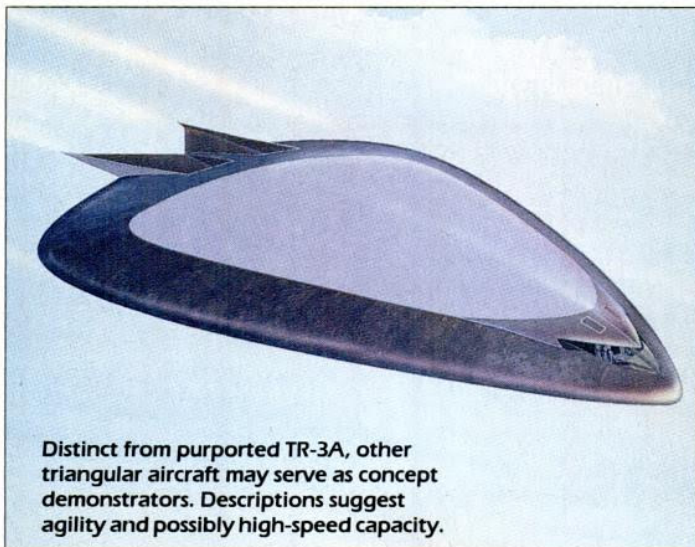
Based on observer's descriptions, rounded surfaces mark TR-3A, which also may have inwardly canted vertical control surfaces.

with the F-117As that pass one by one over Antelope Valley. Its engines reportedly run more quietly than the muffled General Electric F-404 powerplants on the Stealth fighter. Ground observations are inconclusive on whether any vertical control surfaces jut from the aircraft's back. Descriptions suggest the plane evolved from a top-secret Northrop prototype concocted under the Air Force's original Stealth program in the mid-1970s.

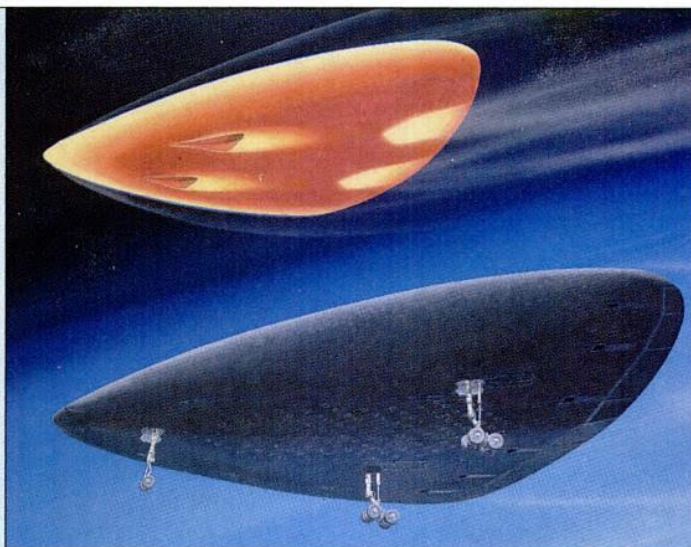
According to the *Aviation Week* report, the vehicle has a range of 3000 miles. Its mission: to collect tactical photographic reconnaissance data and relay target information directly to F-117As in near-real time. Apparently dedicated to Stealth fighter support, the TR-3A would supplant the RF-4C in carrying out low-level recon runs if it came into wider use. But if it's capable of high-altitude missions, as *Aviation Week* suggests, the plane

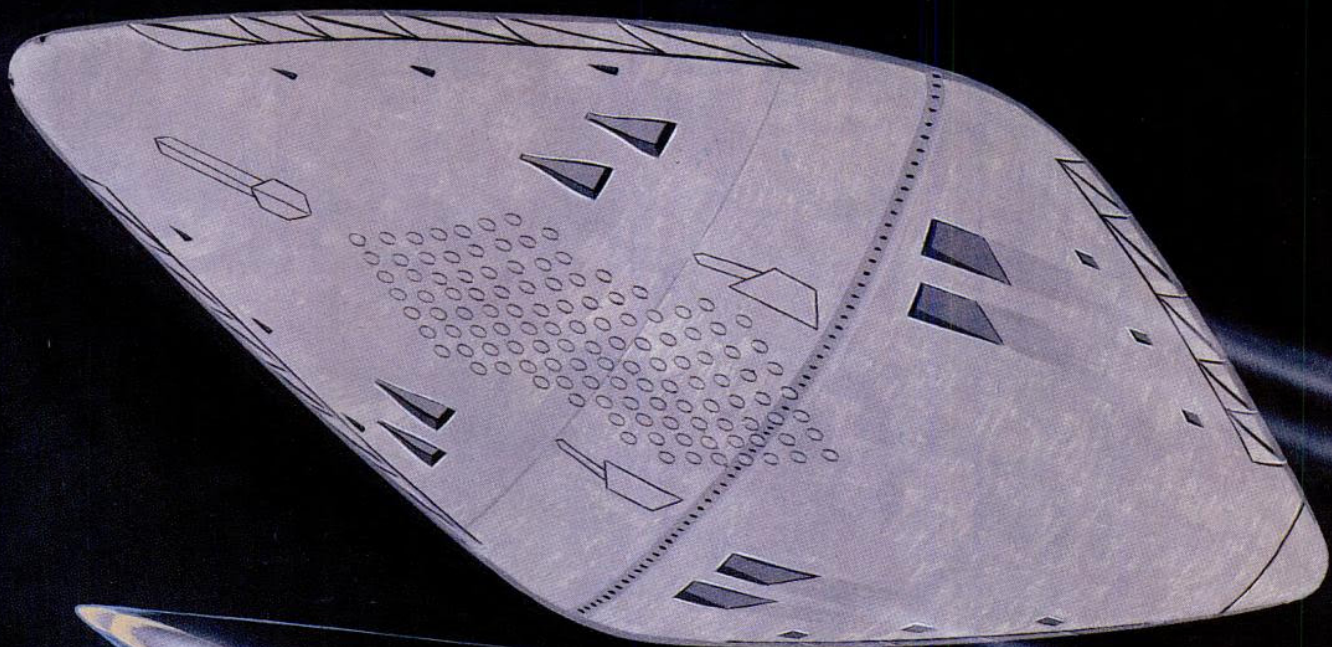
could also be a follow-on to the TR-1, a modernized version of the U-2 spyplane. Given the frequency of sightings and the association with F-117As, it's likely that the secret planes are operational and may have seen action during Operation Desert Storm.

Other reports of flying-wing triangles do not match the TR-3A descriptions. An aircraft with a wingspan close to 150 ft.—roughly that of the B-2 bomber—has been sighted by observers who insist that they can distinguish the B-2 at night. Unlike the purported TR-3A, this vehicle appears highly maneuverable. One is said to have turned 90° on its wingtip. Not spotted as often as the purported TR-3A, the craft may be a proof-of-concept vehicle for the Navy's now-canceled A-12 attack plane, an older technology demonstrator for the B-2 or a one-off experimental prototype.



Distinct from purported TR-3A, other triangular aircraft may serve as concept demonstrators. Descriptions suggest agility and possibly high-speed capacity.



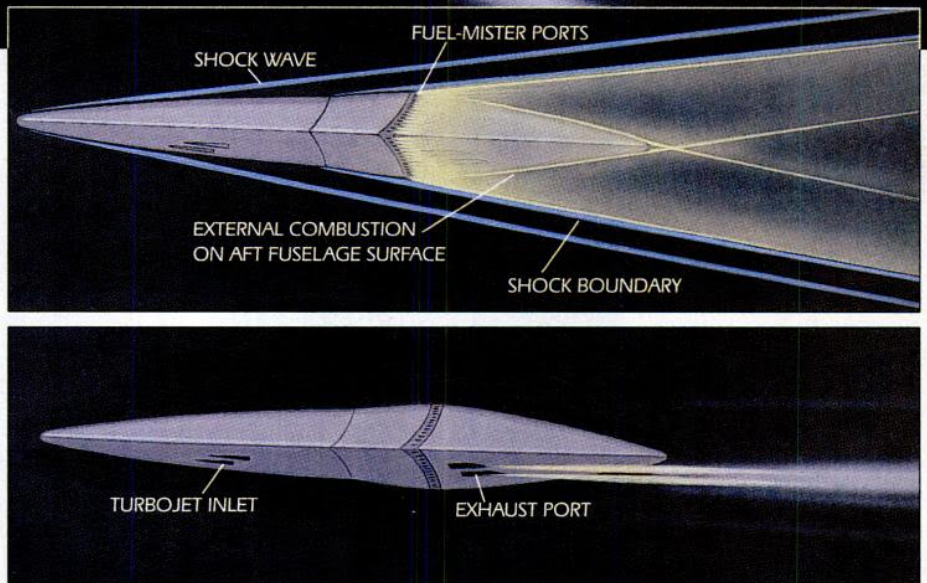


Blackbird's progeny

A separate species of air vehicle has been heard more often than seen. Several times in the past three years, a window-shaking din has awakened Antelope Valley residents between 3 and 5 am. They describe the sound as a "low-frequency buffeting," or a "pulsing roar"—"like the sky itself is tearing"—and distinct from the noise emitted by rocket engines.

Observers standing beyond the cast of streetlights tell of a swift, high-altitude light that accompanies the pulsing noise. "This object did a racetrack turn at high speed," one witness told *POPULAR MECHANICS*, "then shot straight up with tremendous acceleration." Another said the light moved from horizon to horizon—well over 100 miles—in under a minute. The descriptions correlate with reports from Nevada residents and other accounts in *Aviation Week*.

A high-flying, hypersonic vehicle has been the subject of speculation ever since a line item tagged "Aurora" appeared under a strategic-reconnaissance heading in a 1986 Pentagon procurement document. Thought to be a follow-on to the SR-71 Blackbird, analysts have placed Aurora at both Edwards Air Force Base and Nellis Air Range.



External-combustion ports (top) at mid-fuselage release fuel that burns in cone bounded by shock wave. Conventional jets (above) take over at low Mach numbers.

Whether an aircraft code-named Aurora is operational, experimental or simply a red herring, an air-breathing vehicle that flies above Mach 6 would probably rely on a novel propulsion method that might explain the pulsing sound. During the 1950s and 1960s, engineers researched external-combustion systems, whereby a hypersonic aircraft pumps fuel from its midsection into a cone of air bounded by its shock wave.

Ignited externally, combustion

gases expand against a nozzle surface shaped by the inner face of the shock wave and the aircraft's tapered aft fuselage. Such a system ensures that fuel and air stay in contact long enough to burn at high Mach numbers, says Gerald Gregorek, aeronautical engineering professor at Ohio State University. Even the scramjet, under development for the National Aerospace Plane, may function partially by external combustion.

(Please turn to page 109)

AMERICA'S SECRET AIRCRAFT

(Continued from page 35)

The big wing

Meanwhile, several Antelope Valley residents say they've seen a craft that simply strains credulity.

According to reports over the past two years, a vast black flying wing, estimated at between 600 and 800 ft. in width, has passed silently over city streets, empty desert and rural free-ways. The craft moved so slowly one observer said that he could jog along with it. A pattern of seemingly random white lights on the vehicle's black underside provided "constellation camouflage" against the starry sky. Observers who followed the craft long enough detailed unlikely maneuvers in which the vehicle stopped, rotated in place and hovered vertically, presenting a thin trailing edge to the ground.

Although such sightings encourage those who link the military with unearthly technology, a mammoth, quiet flying wing may have a conventional explanation: It could be a lighter-than-air craft pushed by slow-turning propellers. Certainly, such a vehicle could elude Doppler radar by slowing to a crawl. Alternatively, the fact that the craft holds station vertically suggests that it might serve as a huge reflector for a bistatic radar system. Other possible missions include troop delivery or covert surveillance.

Black and white

Sightings of all these aircraft may offer a preview of 21st-century air power. Or they may be hints of experimentation, hardware versions of engineering concepts. Denied classified data, experts must simply guess. "In the late '70s," says Wolfgang Demisch, an aerospace analyst with UBS Securities, "there was concern at senior levels of government that a lot of technology was about to disappear because people were close to retirement. Projects in the 1980s may have pushed this technology as a way of maintaining the national capability built up in the '50s and '60s."

Masking such capability behind classified special-access status has been the trend for the past decade. But that trend is shifting now. The growing number of unofficial sightings may signal that security will soon lift, just as the F-117A went public because daytime flight requirements would reveal the aircraft anyway. If the "black" air vehicles now prowling desert skies also venture into the "white" world, technology spinoffs may be enormous. If not, then these aircraft will remain America's most closely guarded secrets. **PM**

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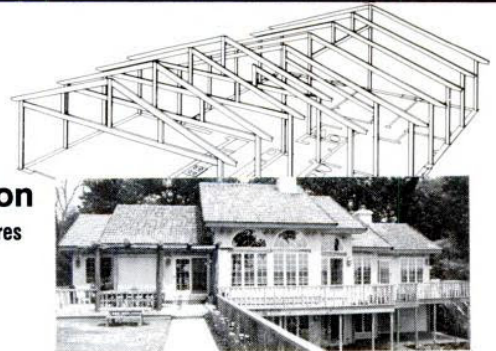
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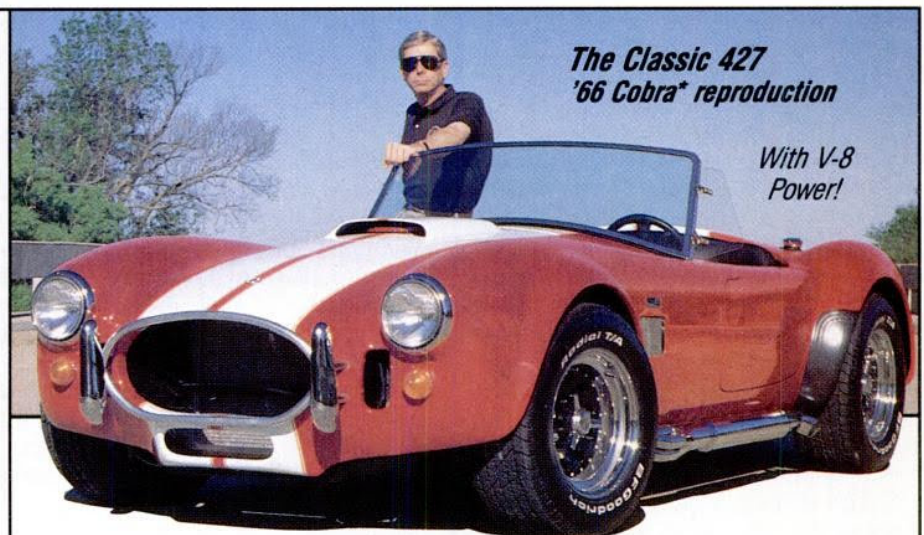
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