

Possible 'Black' Aircraft Seen Flying In Formation With F-117s, KC-135s

LANCASTER, CALIF.

What may be a highly classified, "black" Air Force aircraft has been flying with F-117 stealth fighters and KC-135Q tankers near Beale AFB, Calif., in recent months, prompting speculation that the vehicle may be based there.

Observers said the aircraft—which has a distinctive engine noise described as "a very, very low rumble, like air rushing through a big tube"—has been heard several times in recent months, but had not been seen until the last week of February.

At about 6:15 p. m. on Feb. 25 and 26, KC-135Q air refueling tankers took off from Beale AFB, followed a short time later by aircraft displaying a diamond-shaped lighting pattern. The unknown aircraft would overtake the tankers, join up in a tight formation and then extinguish all external lights. The rejoin was completed within a few miles of the Northern California base.

Observers said the aircraft had a red light near the nose—similar to the F-117 configuration—two "whitish" lights near what would be conventional wingtips and an amber light near the tail. They said it was definitely a diamond pattern, not the triangular shape reported by AVIATION WEEK & SPACE TECHNOLOGY last year (June 10, 1991, p. 20).

Observers said that at about 9:30 PST on one of those nights, they spotted two T-38 Talon trainers near the base, flying line-abreast with their landing lights on, escorting a third aircraft between them. When the unknown vehicle turned its lights on about 3 mi. from the Beale AFB runway, it had the same diamond-shaped lighting pattern seen earlier that night. The distinctive engine noise had a varying pitch, which was assumed to be related to throttle adjustments as the unknown aircraft

'Black World' Engineers, Scientists Encourage Using Highly Classified Technology for Civil Applications

WILLIAM B. SCOTT/LOS ANGELES

A small faction of "black world" engineers and scientists are encouraged by recent government commitments to open intelligence agency files, and congressional threats to curtail funding for some highly classified projects.

Such chilling prospects normally would be viewed with alarm by all who get paychecks from U.S. intelligence agencies, but a few technical personnel see opportunity instead of gloom. This minority hopes issues raised over the last two years are bearing fruit now, and might push some black technology into the open eventually.

In voicing their views, this small group of scientific professionals dared to break a code of silence that rivals the Mafia's, and several individuals claim they have suffered accordingly. Two said they can prove their civil rights were blatantly abused—always in the name of security—either to keep them quiet or to prevent their leaving the loosely structured, yet highly controlled intelligence R&D community.

"Once you're in, they don't let you go," an engineer said.

Many dedicated "spooks" undoubtedly went into a defensive crouch when Robert M. Gates, director of the Central Intelligence Agency, announced last month that some CIA files would be opened. Openness is anathema to the intelligence professional; it defies all Cold War rules of business. But the world has changed, and Gates realized the CIA and its sister agencies must adapt.

Within days of Gates' announcement, several congressmen declared open season on black programs they believed were un-

necessary since the Soviet Union disbanded (AW&ST Mar. 2, p. 62).

Proponents of "deep black" programs point to the lessons of history, noting that dictators and tyrants with dreams of world domination have popped up repeatedly. And when that happens, the U.S. must have a technological arsenal capable of stomping out the threat, they argue.

NEWS ANALYSIS

The nation's "silver bullets" are best developed in the black, where neither friend nor foe knows they even exist, let alone how effective they are.

Opponents of the status-quo, keep-it-all-classified school see a different "new world order" emerging. These engineers, scientists, technicians and aircraft mechanics believe that U.S. economic national security is more at risk today than military security. One way to combat economic threats to each citizen's standard of living and prosperity is to release some of the secret technology already developed at taxpayer expense, they maintain.

One scientist identified several "black world" breakthroughs that, he believes, have both military and commercial potential. The technologies include:

- Very sensitive infrared sensors that do not require cryogenic cooling. The researcher claimed that, by reducing IR sensor thermal noise through "electrostatic heat transfer" techniques, today's best IR array could operate at sensitivities "several orders of magnitude better than is possible with cryogenic cooling." Environmental monitoring satellites—as well

as strategic defense sensors on Brilliant Pebbles and Brilliant Eyes spacecraft—could use this technology to extend the on-orbit life of infrared sensors indefinitely. Currently, the operational life of an IR space sensor is limited by the amount of cryogenic cooling material available.

- Instantly altering the thermal equilibrium of a large optical lens or mirror through electrostatic "bulk cooling" methods. The result is analogous to that attained with phase conjugate optics in telescopes or imaging devices employing an elastic-type mirror. "We spent a lot of time in the [1980s] developing a micro-processor interface to a high-voltage power supply . . . to control optical arrays," he said. "The results were absolutely astounding."

- Using sensitized random access memory (RAM) to detect or transmit low levels of near and far-infrared energy. When incorporated into a feedback system for temperature stabilization, the RAM could be used as "an esoteric IR detector that is simple and reliable," he claimed.

- Low-observable ceramics made from powdered, depleted uranium. The resulting dielectric material has approximately 92% the bulk density of depleted uranium, but is about 20 times harder. So far, the ceramic has been demonstrated in a "stealth artillery shell" that cannot be detected by radar. Although the ceramic is of great interest to the U.S. Army, "black world" power struggles over ownership of its manufacturing process is preventing the material's broad application.

- Short-pulse Doppler radar (SPDR)—which may be the black world's term for ultra-wideband radar (UWB) (AW&ST

maintained position slightly behind the T-38s, out of their landing lights.

A formation comprising a KC-135Q, two F-117s—one flying near each tanker wingtip—and a trailing aircraft with the diamond-shaped light pattern was seen on the night of Feb. 27. The aircraft were flying south near Beale AFB, then turned to a northeasterly heading. During the banked turn, one observer had a good view of the diamond light pattern, although the aircraft structure was not visible. Wing lights were much brighter than normal navigation lamps, but did not illuminate the aircraft's planform, he said.

The vehicle's wing lights were about twice as far apart as those on an F-117, and nose-to-tail light spacing was about 50% longer than that on the stealth fighter, he said.

The Air Force operated Lockheed SR-71s from Beale AFB until the high-speed reconnaissance aircraft were retired. Area residents said there was very little T-38 activity at the base after the SR-71s left, but that had changed in the last few months. SR-71 pilots flew T-38s to maintain proficiency. A number of camouflaged aircraft that observers believe are T-38s have been seen at the base recently. Aircraft with the same paint scheme are flown from a base near Tonopah, Nev., home of the F-117.

The unknown aircraft may have been moved to Beale AFB in recent months. If they routinely fly lights-out with a tanker, pairs of T-38s, F-117s or other military aircraft, their presence may have escaped detection by civilians for some time. Also, the unknown aircraft's engine noise would be effectively masked by the loud roar of a KC-135's powerplants. □

Dec. 4, 1989, p. 38). One black-world researcher claimed an over-the-horizon SPDR operating at 50 kw. output power, transmitting a short pulse with a duty cycle of approximately 0.003, could detect air vehicles 2,500 naut. mi. away in all weather conditions. The receiver employed a "Bragg cell channelizer," he said.

However, the capability of SPDR to also detect stealthy vehicles has kept the technology in limbo since the mid-1980s. "Anybody who brought it up at [a company] got his nose cut off," the scientist said. Although he was not familiar with the bitter controversy over UWB since 1989, he said the earlier suppression of SPDR "was absolutely criminal, because any stealth technology stood out like a sore thumb when hit with short-pulse Doppler" (AW&ST Oct. 21, 1991, p. 22; Nov. 19, 1990, p. 18).

Engineers working on highly classified programs cited other technologies that appeared to this editor as only military related. They said that—if the principles were widely understood—though, there would be definite commercial applications.

One was a "thermal signature masking technology... which is used on the B-2 [stealth bomber]," an engineer said. "Basically, it's an electrostatic heat transfer phenomena that charges the jet engine exhaust stream to disperse the heat—by a factor of about 800. It does a remarkable job of altering the thermal signature."

He said the same basic technology, used in wing leading edges, can reduce a flying vehicle's radar cross section (RCS) by masking thermal signatures created by aerodynamic perturbations of the air.

"The radar signature of an incoming warhead can be reduced to less than 10%" of its normal value, the engineer said. "We found that radar cross section had a lot to do with aerodynamics and turbulence—past certain speeds."

Electrostatic field-generating techniques in the B-2's wing leading edges

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may help reduce its RCS. The bomber's leading edges posed a particularly challenging production problem on the first aircraft, and may have been the source of diminished results during early stealth flight tests.

In 1968, Aviation Week reported that Northrop was evaluating "electrical forces to condition the air flowing around an aircraft at supersonic speeds" to reduce drag, heating and sonic boom effects. The findings were promising enough to justify funding of additional research (AW&ST Jan. 22, 1968, p. 21).

By negatively ionizing air molecules ahead of an aircraft, then charging the nose to the same polarity, an electrostatic field was formed. The field tended to repel or alter the molecules' path as the aircraft approached, according to the article.

If the "black world" actually has developed feasible ways to reduce airframe

drag substantially with controlled electrostatic fields, commercial aircraft manufacturers and airlines should be campaigning mightily for the technology. The potential fuel and cost savings for just American, United and Delta would be staggering.

A scientist said other, more dramatic, classified technologies are applicable to lasers, aircraft control and propulsion. However, the scientists and engineers were especially hesitant to discuss these projects. One said they are "very black. Besides, it would take about 20 hr. to explain the principles, and very few people would understand them anyway."

Whether or not black technologies will be released in the near future or not will depend more on political power wielded in Washington than the recommendations of dissident "insider" factions. It appears that most within the intelligence research and development community are highly skeptical of even Gates' born-again approach, despite the high hopes of openness proponents.

Defense Secretary Richard B. Cheney said there was no near-term plan to declassify technology now trapped in the "black world." He said the need to maintain a qualitative edge over potential adversaries "always will take precedence" over economic competitiveness issues (AW&ST Feb. 17, p. 17).

Whether that status-quo posture will stand in the face of intense Japanese and European competition during a presidential election year is yet to be determined—especially when U.S. and allied contractor executives are scrambling anxiously for ways to turn defense technology into commercial products. □