Russians Admit Testing F-117 Lost in Yugoslavia

DAVID A. FUGLUM and ROBERT WALL/MOSCOW and ZHUKOVSKY, RUSSIA

Mystery surrounded the ultimate fate of the aircraft. Now it has resurfaced as a research tool for missile designers.

Russian officials admit for the first time they are using remains from the U.S. Air Force stealth fighter shot down over Yugoslavia to improve the ability of their air defense systems to detect and kill stealth aircraft.

Also as part of the effort, designers say a small number of Russian tactical aircraft have been upgraded with locally produced, low-observable modifications to further test and improve their surface-to-air missile (SAM) designs.

Acknowledging that researchers had access to the remains of the F-117 strike aircraft shot down in 1999 during the Kosovo air campaign, a senior Russian aerospace official said, "Yes, of course. We've been able to test our system against the broken pieces."

But the find is proving somewhat less than a Rosetta stone to unlocking the secret of targeting stealthy aircraft. Because only sections of the F-117 survived intact, "we haven't been able to model the entire [low-observable bomber]," the official conceded. "It's not the same as testing against an undamaged F-117. You provide us with a complete stealth aircraft and then we'll tell you how effective we are against it."

One of the problems engineers face with having the F-117 parts is that they can't accurately determine how radar energy is dissipated over the entire aircraft. Furthermore, the faceted stealth design of the F-117 won't necessarily provide many clues to how best to defeat the stealth designs on the B-2 or the F-22. These aircraft use different materials and handle radar energy differently.

Even so, the F-117 analysis represents only a portion of Russia's antistealth efforts. Experts also have been pursuing other ways to fine-tune their air defense missile systems to stop attacks by small stealthy cruise missiles (a problem that also has riveted U.S. researchers and military planners) and stealth aircraft.

A second prominent Russian expert said that his project development team can...
Prominently on display at the Moscow air show were low-frequency, long-range surveillance radars, including this lineup, as well as the latest surface-to-air missile designs.

now locate low-signature targets at something near 60 m/s, a range great enough to be "tactically useful." That would indicate that the new generation of air defense missiles could defend high-value sites against cruise missiles and long-range weapons, but not against stealth aircraft launching long-range stand-off missiles.

Although Russia hasn't fielded a follow-up, stealth aircraft that could be used in tests of its improved air-to-air and ground-launched air defense missile systems, industry officials said the Russian air force has modified and significantly decreased the radar cross section of at least two tactical aircraft. The "special aircraft" with reduced radar reflectivity have been made available for the aerospace industry's stealth and antistealth development programs.

Researchers have been testing several components of their air defense systems against those secret test assets, including the radio-frequency networks on surface-to-air missiles and proximity fuses. Similar tests are being run against the F-177's components. Data from both is then fed into huge databases to be used in simulations of stealth targets. Using the flying test beds, developers say they have been able to detect reduced signature aircraft. The test data are being used to produce improved sensors with increased detection ranges.

However, there is a major obstacle to accelerating development of defense against stealth aircraft and missiles. "We have to simulate engagements against stealth [vehicles]," the first official said. "Using a real stealth target and destroying it is too expensive. We are doing flying tests [against the modified fighters], but we can't do firing testing."

Another limitation the researchers are encountering is that the test aircraft can only fly at subsonic speeds. While that performance is adequate to be able to assess an air-defense system's performance against an F-177 or B-2, it won't suffice for the more modern stealth aircraft, such as the F-22, which can fly at more than Mach 2.