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## Stealth Technology: Progress in Concealing Planes

By DREW MIDDLETON

The United States appears to be winning the race with Soviet anti-aircraft defenses with its effort to produce Stealth bombers and cruise missiles virtually undetectable by radar.

Air Force sources report steady progress, though they concede that any innovative program can be delayed by "unknown unknowns" that crop up when designers venture into a completely new field, making a plane that cannot be detected by radar. A prototype has yet to be produced.

As things stand now, Stealth technology, a combination of materials, coatings, designs and surface shapes that absorb or deflect rather than reflect radar beams, will concentrate first on the production of 100 B-1B long-range bombers. There have been reports that the Air Force is also developing a Stealth fighter. According to current planning, the 100 B-1B's should be operational by 1986 at a cost estimated at \$20 billion. The plans also call for 110 Stealth craft known as Advanced Technology Bombers, to be operational by the early 1990's at an estimated cost of \$30 billion.

### Critics Doubt a Need

Critics of these programs in Congress and in the military-academic community question whether both programs are needed. The Air Force answer is that the age of the B-52 bomber force demands deploying of the B-1B to provide a bomber that will be able to penetrate the increasingly powerful Soviet defenses.

Some important pieces of Stealth aircraft technology have been built into the B-1B. The cross section of the aircraft that will be picked up by radar is less than one square meter as against 10 square meters in the B-1A's and the 100 square meters of the more elderly B-52's. A meter is equal to 39.37 inches.

Several new technologies are being blended into the Stealth bomber to reduce radar reflections to the point that the enemy device registers only an undetectable echo. If current developments prove successful, the resulting aircraft is likely to resemble a flying wing.

One step is to eliminate angular parts of the airframe. This was done with the B1-B and helped reduce its radar signature. In designing the Stealth craft, engineers are considering placing the engines at the rear and atop the wings, where the turbine blades can be hidden from radar.

### Materials to Absorb Radar

Designers also are experimenting with radar beam-absorbing materials that will reduce the aircraft's radar reflection. Delta wings made of composite materials that are lighter and stronger

than steel or titanium are being considered. Among materials under consideration are carbon and fiberglass and fiber-reinforced airframe skins. Another avenue of research is experiments with special paints that can absorb or deflect radar signals.

The final Stealth aircraft also will be stripped of engine nacelles and edges that reflect radar.

An Air Force source said that if it was possible to visualize the final result of these developments, the Stealth bomber would have V-shaped delta wings and engines integrated into the fuselage, an improvement on the flying wing that was flown experimentally 30 years ago.

The Defense Department's program for both the B-1B and the Stealth bomber is a reaction to the steady expansion of Soviet air defenses, the largest in the world, built to counter bombers and cruise missiles. The cruise missile, a winged jet-powered bomb, is designed to avoid enemy radar by flying close to the ground. It has a radar and computer system that guides it over irregularities in terrain.

The Military Balance, a publication issued by the International Institute for Strategic Studies in London, reports that the Soviet Air Defense Force includes 10,000 surface-to-air missile launchers on 1,400 fixed sites, 13,000 launcher rails, 7,000 warning systems with ground-control intercepting radar sets, satellites and electronic warfare systems, 2,250 interceptor aircraft and 9,000 pieces of anti-aircraft artillery.

The Air Force's answer to these formidable figures is a bomber that will be almost invisible to radar and will be able to hug the ground at altitudes of 200 feet or less.

Current emphasis is on the Stealth bomber. But highly qualified but unofficial sources report the Air Force is also developing a Stealth fighter. One report is that this plane's airframe will be built of a new composite material made of glass fibers woven into a plastic base.

Additionally, the Air Force is moving toward development of an advanced cruise missile program that will be a follow-up to the AGM-86B air-launched cruise missile. Soviet progress in the development of "look down" radar that would spot the original cruise missile and the advances in Stealth technology for bombers prompted the switch to the development of an advanced cruise missile that would be impervious to radar.

### New Designs for Missile

New cruise missile designs that incorporate engines that may be made of plastic parts and offer low fuel consumption and greater resistance to hostile radar are the goals. Two engines now under consideration would raise the cruise missile's range to 1,600 miles

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## Pentagon Is Criticized For Inauguration Role

WASHINGTON, May 30 (AP) — Military personnel were improperly assigned to be ushers and social aides for President Reagan's inauguration, Congressional auditors said today.

The General Accounting Office study, requested and released by Senator William Proxmire, Democrat of Wisconsin, is the latest chapter in a long dispute over the role of the Pentagon in Presidential inaugural ceremonies.

Senator Proxmire said \$1.8 million of the cost of Mr. Reagan's inauguration in 1981 came out of the Pentagon's budget and should be repaid by the Presidential Inauguration Committee.

Military participation in inaugurations is not new, but the G.A.O. said the Pentagon's role has increased in recent years. The researchers cited Defense Department figures showing 11,430 armed forces personnel provided support for activities associated with Mr. Reagan's inauguration. According to Mr. Proxmire, 8,329 military personnel were used in the inauguration of President Carter in 1977.

The G.A.O., an arm of Congress that audits the performance of Government agencies, questioned the assignment of members of the armed services to such inaugural chores as personal escort, social aide, usher and chauffeur. They also took part in the inaugural parade, acted as parade route cordons, removed snow and provided security.

from 1,500 miles.

The reduction of aircraft noise is a relatively minor problem in the Stealth development. Sound-absorbing materials in engine housings, redesigned turbine blades and new engines are expected to deal with the noise problem.

While Air Force officers concede that the Stealth program is a race with Soviet efforts to improve radar and other detection devices, they point out that such a race is part of superpower competition. As an example, they cite the race to establish a sure means of submarine detection. And, they warn, as long as the Soviet Union and the United States are military rivals, the competition will continue.

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*Philip Geyelin***'Covert' Means 'Last Resort'**

In the aftermath of the Bay of Pigs debacle in 1961, President Kennedy wanted a postmortem from someone in the White House who had not been directly involved; so he asked Walt Rostow for a recapitulation of how it went so wrong.

The report was secret. But I recall indelibly what Rostow told me was his bottom line: leaving aside the execution of the operation, he thought it only fair to bear in mind that "the CIA only gets terminal cases" when conventional means have failed. The CIA was being asked to undo covertly what the policymakers on high had been unable to prevent overtly, for whatever reasons: lack of foresight; ideological hang-ups; domestic political inhibitions; clumsy diplomacy; a mistrust of the potential of timely foreign aid.

Rostow's rule of last resort goes to the heart of the current controversy over the Reagan administration's Central American policy as it is nicely laid out in a recent report by the House Permanent Select Committee on Intelligence.

Contrary to the complaints of some critics who would have preferred a mish-mash of bipartisan compromise, the force of this report is in the refreshing party-line precision with which the issue is joined. The nine Democratic committee members tell why they voted to end covert CIA support to insurgent forces inside Nicaragua, while voting an extra \$80 million in overt help to Honduras and El Salvador. The money would mostly be for building barriers and installing radar, sensors and other sophisticated equipment to choke off Nicaragua's supply lines to the leftist rebels in El Salvador. The five Republicans tell why they think this approach would gravely undercut the Reagan policy.

The argument was over means, however, not ends. The importance of El Salvador's salvation from communism is taken as a given. So is the Marxist-Leninist menace from Nicaragua. The El Salvador insurgency "depends for its lifeblood . . . upon outside assistance from Nicaragua and Cuba," the Democratic majority freely concedes.

At this point we confront Rostow's Rule: the committee Republicans would turn the patient over to the CIA for covert treatment. They are careful to argue a distinction between covertly aiding Nicaraguan insurgents for the purpose of "interdicting" supplies to El Salvador (which is all the current law permits)

and actually contributing to the insurgents' proclaimed purpose of overthrowing the government in Managua.

But the minority members speak of "attempting to disarm or neutralize Nicaragua" in a way that unmasks their (and Ronald Reagan's) real design: to undo the past by replacing the Sandinista regime with one more congenial to U.S. interests. It is, with appropriate modification, the "Bay of Pigs" mentality at work.

The majority argument, quite simply, is that this won't work. The CIA will be "hurt" by being asked to "continue an action whose principal elements are known to all the world." And this common knowledge will fuel hostile propaganda in a hemisphere with long memories of heavy-handed and imperious Yanqui intervention.

More important, if the administration's own cries of alarm are to be taken seriously, the year-long "interdiction" mission has failed; when it fits the administration argument of the moment, we are told that El Salvador is endangered by an ever increasing flow of supplies from Nicaragua.

The administration (and the committee Republicans) would also have us believe that inciting insurgency in Nicaragua will turn the Sandinista government inward in its own defense, discourage external adventurism, encourage a willingness to negotiate. To which the committee Democrats respond that the results have been just the opposite:

"Inflicting a bloody nose on nations achieves a purpose no different with nations than with individuals. It tends to instill a deep desire to return the favor. The Sandinistas are no different. Their policies have not softened. They have hardened."

What's more, a U.S.-supported Nicaraguan insurgency actually "tends to bind the Nicaraguan population—even those with little enthusiasm for the Sandinistas—together against the threat of attack."

The Democrats argue that their open approach is the best way to show U.S. determination and commitment. The Republican answer reads like a declaration of bankruptcy: "With the stakes so high and with the uncertainty of U.S. resolve, the governments in Central America would be unwilling to work with us in the overt program to reduce the flow of external support to the Salvadoran guerrillas."

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U.S., Philippines Said to Complete New Agreement on Military Bases

MANILA—The United States and the Philippines will sign a new multi-million dollar, five-year military bases agreement governing the use of two of America's largest overseas installations, it was officially announced yesterday.

The announcement said the accord, to be signed Wednesday, includes a "substantial compensation package" from the United States, but gave no figure, United Press International reported.

However, Filipino sources said the amount would be between \$900 million and \$1 billion. The new figure would amount to a substantial increase over the \$500 million in the last five-year agreement, but is less than the \$1.5 billion the Philippines was reportedly seeking.

The United States operates two major military installations in the Philippines—Clark Air Base and Subic Bay Naval Base.

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**Pershing 2 test-firing a success, Army says***United Press International*

CAPE CANAVERAL, Fla. — The Army successfully test-fired a Pershing 2 missile yesterday on an 980-mile flight into the Atlantic Ocean south of Bermuda.

"As far as we now know, everything looked just fine," said Dave Harris, spokesman for the U.S. Army missile command at Huntsville, Ala. It was the 11th Pershing 2 test flight. In December, 108 of the intermediate-range missiles are scheduled to be deployed in Europe.

If that's so—if our friends won't work openly with us in their own defense—then the U.S. position may be so weak that it cannot be salvaged by either overt or covert means. But overt-versus-covert is nonetheless what the current debate is all about. And Rostow's Rule is an apt reminder that when you are talking "covert," you are talking last resort.