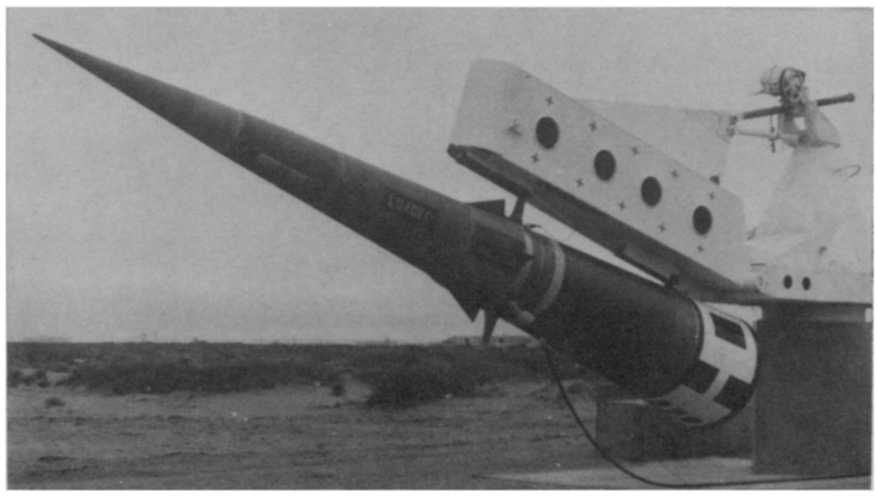
The ABM: How good?

Both the political and the technical effectiveness of missile defense are questioned



DOD

Sprint missile: last gasp defense against ICBM's may be ineffective.

The antiballistic missile system is under attack from two directions.

Technically, it is being questioned whether a missile defense system of the kind now being built in the United States would be effective even against such a crude nuclear attack as China could mount in the coming years. The thin deployment at present being undertaken is ostensibly aimed at a possible Chinese threat.

On the political side, it is becoming clear that hopes for limiting the spread of nuclear weapons are going to depend on some indication that the present nuclear giants are willing to curb their enthusiasm for developing progressively more expensive and sophisticated doomsday weapons, leaving non-nuclear nations further and further behind. The current upward step is the development of ABM systems, underway both in the U.S.S.R. and the U.S.

As an objection, the disarmament question is now paramount; other objections to a nuclear non-proliferation treaty have been jointly defused by the nuclear powers. The question of peaceful uses of nuclear technology has been met by pledges to supply the technology and explosives at cost to any nation that wants them, and the possibility of nuclear blackmail of a non-nuclear treaty signatory is greatly reduced by joint pledges by the U.S., U.S.S.R. and Britain to come to the aid of any nation so threatened. This promise, offered in Geneva last week, comes up with the treaty for debate before the United Nations in April.

The thin ABM deployment was defended by former Defense Secretary Robert S. McNamara as making such a pledge more effective, since it would eliminate the possibility that China could blackmail the U.S. as well as another country. However, this guarantee is only as good as the ABM systems that help back it up. And it is the effectiveness of the system that has been seriously questioned.

Major principles on which the ABM depends for effectiveness all have countermeasures.

The ABM would disarm the incoming ballistic weapons by three means: X-rays, neutrons and shock waves, all of them resulting from the ABM's thermonuclear warhead. X-rays are the most promising kill method in the upper atmosphere because they have a large area of effectiveness. Neutrons need careful aiming to be effective, since their range is limited. Blast effects are good only in the atmosphere, but are useful as a last-gasp defense.

The best hope for a nuclear shield is to stop the missiles above the upper atmosphere—this is the function of the long-range Spartan missile part of the ABM system. But it is in this area that cheap countermeasures can be taken.

One way to fool the Spartan is to send along a large number of decoys. The last stage of the rocket can be broken up, creating a number of fake targets. Metal-coated balloons, inflated in space, can ape the shape of incoming weapons. And thousands of small copper wires, called chaff, can be released to block out radar systems that warn of incoming missiles and guide the defensive Spartans to their targets.

Another way of frustrating defense is to set off a space explosion which would black out radar for enough time to penetrate the screen.

Decoys usually would not penetrate the atmosphere, so the terminal part of the ABM system, called Sprint, would not be bothered seriously by them. But catching all possible bombs after they reentered the atmosphere would mean a Sprint system around every city in the country. Even a well-protected city could be vulnerable if the aggressor concentrated on it.

It is argued that penetration aids are too sophisticated for Chinese systems. But as nuclear consultant Richard L. Garwin of IBM Corp. points out, the Chinese are presumably building their missiles with the idea of countering the well-publicized U.S. ABM system. "It is well within China's capabilities to do a good job at this without intensive testing or tremendous sacrifice in payload," he asserts in the March SCIENTIFIC AMERICAN.

Under these conditions, the suspicion arises that the U.S. deployment is merely the first step in an ABM aimed at neutralizing the Soviet strategic missile force.

But with Russia's industrial capacity, any ABM system could be nullified by building more missiles than there are ABM's to shoot them down. Since offensive missiles are cheaper than ABM's, the defensive system would buy nothing; Secretary McNamara himself made this point.

All of which leads to the anxiety of Arms Control and Disarmament Agency officials, negotiating successfully on the non-proliferation front, that further deployment of ABM's not be undertaken. The most important step, they feel, is to get talks going with Russia on limiting the ABM.

"The Vietnam situation makes it difficult for the Russians to talk on this subject," says one ACDA official. "But I don't see why we can't get something started. We're sure trying."