TOP SECRET



[redacted]
Copy [redacted]

10 DEC 1963

MEMORANDUM FOR: Director of Central Intelligence

SUBJECT: Washington Post Article on Satellite Reconnaissance.

1. As a result of a preliminary analysis of the article entitled "Our Fantastic Eye in the Sky" which appeared in the Washington Post on 8 December 1963, OSA/DD/S & T has concluded that virtually all of statistics and "disclosures" featured in the article have previously appeared in public print and can be considered to be in the public domain. This does not in any way foreclose on the possibility of security breaches which might have pertained with regard to the original disclosures, but it does suggest that they are just being repeated in the article under review.

2. Analysis of the article undertaken by OSA results from a necessarily cursory examination of the large body of material which has previously been published on satellite reconnaissance. Considerable more time than has been allocated for the preparation of this paper would be required to identify specifically all of the publications and articles from which the author has assembled this feature; however we have been advised that the CIA Office of Security has undertaken an investigation and a more thorough analysis of the article to establish beyond question OSA's initial evaluation of the article.

3. In summary, [redacted] there are sufficient inaccuracies and omissions to suggest that the author has taken data from open sources and prev[illegible]



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Satellite/Investment

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Control System

publications, embroidered it with some of his own speculation and presented it as a composite and authenic picture of the U. S. satellite reconnaissance program.

ALBERT D. WHEELON
Deputy Director
(Science and Technology)

[redacted]

Distribution:

[redacted]

The Washington Post Outlook

SUNDAY, DECEMBER 8, 1963

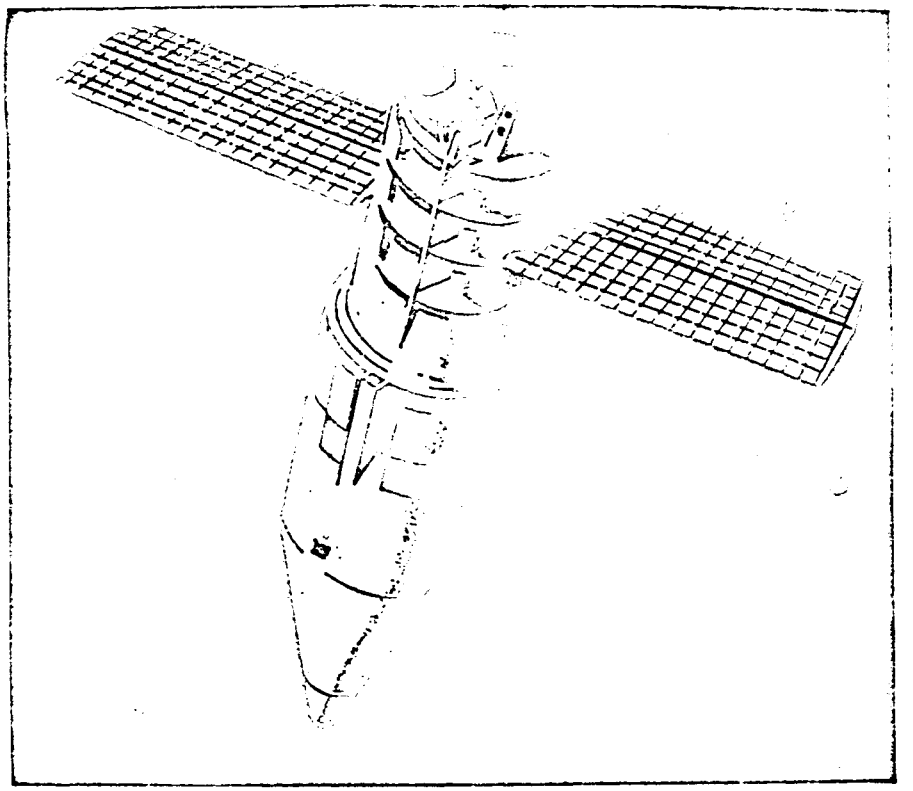
# Our Fantastic

# [redacted] Eye in the Sky

Satellite/Cruadent

(Note: See [redacted] copy in Corona [redacted])

# Samos Satellites Dropping Us Snapshots of Red Half of the Globe





*This artist's conception of a Samos satellite depicts it as an Agena rocket with winglike panels of solar cells to power its equipment.*

*By Howard Simon*
Staff Reporter

ON THURSDAY AFTERNOON, July 21, 1955, at Geneva, Switzerland, President Eisenhower startled the world by proposing his "open skies" plan to break the East-West deadlock on disarmament. But before the day was over, Nikita S. Khrushchev had told the President that his idea was nothing more than a bald espionage plot against the U.S.S.R.

Today, nearly eight and a half years later, the Eisenhower "open skies" plan is still in a diplomatic pigeonhole. But the miracle of science is providing a substitute far superior to what Mr. Eisenhower had in mind. It is an instrument so effective it promises to break down the long cherished Russian ability to keep the Soviet Union a closed society.

This instrument is an orbiting satellite named Samos. In fact, it is a series of such satellites circling the globe together or in sequence. Every 24 hours, by unofficial calculation, one of these satellites, an incredible camera in its innards, passes over the Soviet Union between 8 and 12 times and over Red China two to four times. The spacecraft orbit the globe at 17,000 miles per hour every 90 minutes.

At selected times, on command from the ground, a precious photographic capsule is ejected. It comes down through the atmosphere and is caught in the Pacific Ocean by aircraft of the 6593d Test Squadron operating from Hickam Air Force Base, Hawaii.

## Even Name Is Hushed

THE EFFECTIVENESS of the product of this multimillion-dollar United States Government reconnaissance satellite enterprise is a matter of the deepest secrecy. Whatever pictures have been taken, and they run into the thousands, are highly classified. Even the word "Samos" is now classified and officials are forbidden to speak it to outsiders.

Nonetheless, a good deal has been printed in technical journals in the United States and in publications the Soviet Union. It has been alluded to in speeches and remarks in both nations. For example, nuclear physicist Ralph E. Lapp, in an Ann Arbor, Mich., speech this Oct. 17 said: "A properly instrumented observation satellite making a good pass over a Soviet rocket site should be able to distinguish between a Vostok rocket and the more massive booster needed for a lunar mission. . .

"Development of orbital intelligence techniques may be expected to advance to the point where film will show automobiles on the streets of Moscow."

## Arms Control Factor

U.S. ARMS CONTROL and Disarmament Agency staff member Robert S. Rochlin, while still with the General Electric Co., wrote in the July issue of the Journal of Arms Control that "observation satellites can influence arms control efforts in several different contexts, both as a method for verifying compliance with formal disarmament agreements and as a unilateral method for obtaining information which will affect a nation's attitude toward arms control . . . The information which will be available from national observation satellite systems may be sufficient to permit the United States to reach a compromise with the Soviet Union on the degree of additional inspection which (an arms control) treaty should specify."

In December, 1962, in referring to the vital role of aerial photography and the argument over ground inspection in the Cuban crisis, the late President Kennedy remarked without further explanation that "the camera, I think, is actually going to be our best inspector."

From the other side of the Iron Curtain have come two revealing comments, one public and one private.

Last July 8, Khrushchev, in a talk in Russia with Belgian Foreign Minister Paul Henri Spaak, argued that ground inspectors were "like intruders in a harem" but added that inspection can now be assumed by satellites. He added that perhaps he would let Spaak "see my photographs."

Then, on Sept. 2, Khrushchev's son-in-law, Alexei Adzhubei, the editor of the Soviet government newspaper Izvestia, made a speech in Helsinki, Finland discussing arms control, in which he said:

picture taken of Moscow by a satellite from a height of 750 kilometers (about 465 miles) in which the Izvestia building is plainly discernible. We do not publish pictures of this kind, but I believe that we could print a similar picture of New York taken by one of our satellites."

American officials profess to know nothing of the picture of Moscow to

which Adzhubei referred. They assume that some of the Soviet series of satellites known as Cosmos probably have photographic equipment aboard.

The book "Soviet Military Strategy," published in mid-1962 and edited by Marshal V. D. Sokolovsky for the use of Russian military leaders, contains this passage:

"The United States uses its space vehicles primarily for reconnaissance and espionage, and has already established reconnaissance by earth satellites on a practical basis . . . Project Samos provides for the launching of reconnaissance satellites with powerful television and aerial photographic equipment to photograph and transmit to earth pictures of various targets. This espionage satellite has been called U-3, after the U-2 reconnaissance plane."

## Khrushchev Shock

SAMOS IS, INDEED, the successor to the fantastically successful U-2 which flew unhindered across the Soviet Union for four years before the world-shaking flight of Francis Gary Powers on May 1, 1960. The U-2 idea was presented to the Eisenhower Administration in March, 1954. But not until after the President failed to win Soviet approval of his "open skies" scheme did he approve its actual use over Russia.

In considering the effectiveness of Samos, it is worth recalling now what Mr. Eisenhower's Defense Secretary, Thomas S. Gates Jr., had to say on June 2, 1960, about the U-2:

"From these flights we got information on airfields, aircraft, missiles, missile testing and training, special weapons storage, submarine production, atomic production and aircraft deployment . . . all types of vital information."

[illegible] American officials taken by Powers's camera. Incidentally, at one point before the Powers incident, American officials had discussed but rejected the idea of privately showing Khrushchev some U-2 pictures in hopes of persuading him to agree to ground inspection because so much already had been photographed.

After Powers was shot down, President Eisenhower, and later President Kennedy, pledged publicly not to send the U-2 over the Soviet Union. But they made no such commitment about China, and Chinese Nationalist pilots have been flying U-2s over the Chinese mainland ever since.

## Samos Feats

SAMOS ALREADY was in the works when Powers was shot down. Indeed, one of the few congressional references to Samos came on June 11, barely six weeks later, from Sen. John Stennis (D-Miss.), who is one of six members of the Central Intelligence Agency subcommittee of the Senate Armed Services Committee. During debate on adding $83.8 million to the defense budget for Samos, Stennis said:

"The Samos reconnaissance satellite offers us the only foreseeable means by which we can obtain accurate and timely information about Soviet military installations comparable to that provided by the U-2."

Stennis's statement was prophetic. From what can be learned from nonsecret sources, Samos has:

- Given American intelligence officials their first positive evidence that the Soviets were hardening their ballistic missile sites in concrete coffins and building antimissile defenses around Leningrad.
- Turned up evidence suggesting to some interpreters that Red China is building a gaseous diffusion plant for mass-producing the stuff of atomic bombs.
- Helped American intelligence officials reassess and downgrade previous estimates of Soviet intercontinental [illegible] strength: that is, to [illegible] "missile gap" was nonexistent.
- Enabled American officials to feel more than reasonably certain that they

See SAMOS, Page E5, Column 1.

SAMOS, From Page E1

know the extent of the Soviet missile arsenal and its placement.

• Cast doubt on the Soviet man-to-the-moon project because no evidence has been seen that the Russians are building the kind of super-rockets that American experts think are needed for a lunar landing.

How good the Samos photographs are is difficult for an outsider to determine. But one knowledgeable Administration official who has seen them labels them "remarkable." Others caution that while the quality is good, more refinements, which are in the works, are needed.

## The Beginning

SAMOS, ALTHOUGH it is the name of a Greek island in the Aegean Sea, is actually an acronym; that is, it is made up of the first letters of "Satellite and Missile Observations Systems."

The first attempt to launch a Samos took place Oct. 11, 1960, five months after Powers's U-2 flight, but the satellite failed to achieve orbit. On Jan. 31, 1961, Samos II got into orbit. Samos III blew up on the launching pad on Sept. 9, 1961. But two months later another Samos, by this time no longer allowed to be identified as such, achieved orbit.

There is no way for anyone without access to secret data to know for certain how many more Samos satellites have been sent aloft since then. But from all indications it is an impressive number.

The fact that the Pentagon once talked freely and openly, even lovingly, about Samos makes no difference. The Pentagon may lack the sophisticated device George Orwell invented for expunging history in his novel "1984," but it has tried to do just that.

Hence; a press report last July 4 that the United States Information Agency was ordered to destroy 10,000 pamphlets entitled "U.S. Satellites—The First 50" because they contained once permissible but now forbidden descriptions of Samos and another now secret military satellite.

## The Known

BACK AT THE beginning of the decade, when Samos could be talked about without violating national security, the following was made known:

Samos was being developed by the Lockheed Missile and Space Co., developer of the U-2. The camera-carrying Samos capsule was an Agena spacecraft described as "basically a cylinder with one end pointed." Its gross weight was 4100 pounds and it was 22 feet long and five feet in diameter.

Presumably, Samos has been changed since the early 1960s. Indeed, there are good indications today that two versions of the Samos are being launched: a developmental satellite to try out new schemes and techniques, and an operational spacecraft. One guess is that one is a small version weighing 1700 pounds and the other weighs 3100 pounds.

Some believe that the smaller Samos carries a smaller camera and, when it spots something of interest, the larger satellite, with a larger camera, is sent aloft to obtain clearer and better photographs. It may be recalled that the U-2 was used in the Cuban crisis to spot the Soviet missile work, followed by low-flying planes with other cameras to catch the details.

Physicist Lapp said in another speech last Wednesday that this country's latest model observation satellite carries six film capsules, each about the size of a bushel basket, and that the satellite's camera photographs 70-mile-wide strips of land.

It is generally known that Samos is sent into orbit from one of two neighboring launch sites at the Air Force's Pacific Missile Range about 160 miles northwest of Los Angeles. These sites are at Vandenberg Air Force Base and nearby Point Arguello, Calif.

All Samos satellites travel in a north-south polar orbit to give them maximum flight time over Red China and the Soviet Union. From all indications, both small and large Samos satellites are put into a low orbit, roughly 150 miles above the earth's surface.

After several days in orbit, Samos plunges into the earth's atmosphere to a fiery death. The satellite shell burns up, but by then it has ejected one or more film packs. It is presumed that these packs are protected for re-entry into the earth's atmosphere much in the same manner as the Mercury space capsules or ICBM nose cones. The film packets parachute to earth after re-entry just as did the Mercury capsules with their human cargo.

## Typical Flight

FROM WHAT CAN be pieced together about Samos from the open literature, the following would comprise a typical Samos spy flight:

The Air Force announces merely that "a satellite employing a Thor-Agena (or an Atlas-Agena) booster combination was launched today by the Air Force from Vandenberg Air Force Base (or Point Arguello)."

Once in its proper orbit, the Samos would whirl overhead at 17,000 miles per hour. When over an area which intelligence officials want photographed, a signal is sent to Samos commanding its camera system to begin taking pictures. As soon as the Samos is off target, the camera system is shut off. This conserves power.

Initially, it was intended that two different means would be employed to return Samos photos to earth.

One approach was to have been the employment of television cameras to provide a quick transmission to earth of what the orbiting "seeing eye" saw.

The second approach was to eject a giant film pack from the satellite. The film pack capsule would parachute to earth, where United States Air Force planes would snatch it in mid-air.

There are indications that the Air Force has temporarily abandoned its ambitious TV plans and today exclusively employs the pitch and catch recovery method.

## Fielding Average

SOME IDEA OF just how successful this mid-air recovery has been came late last July when the Air Force gave an Outstanding Unit Award to the Honolulu-based squadron that has been snagging Samos capsules over the Pacific.

The mid-air recovery is believed to be the same as, or similar to, the recovery of packets of the Discoverer satellite series. Photographs of the early successful catches and the planes equipped with airborne grappling hooks were made public in 1960.

At the time the award was given, the Air Force revealed that during 1962 the squadron had achieved 70 per cent success in its catches. In a more recent series, the United Press International said, the percentage was 83. A few weeks ago an official said that he "couldn't remember when they missed one."

Once the film pack is retrieved, it is sent to a Samos photo analysis unit. One such unit is at the Air Force's Satellite Test Center at Sunnyvale, Calif. Here, apparently, high-speed automatic developing and preliminary

scanning takes place. Then specially trained "image interpreters," a new name for aerial photo interpreters, go to work analyzing what the Samos cameras recorded.

This data is then coordinated with other data returned from Samos, which apparently also carries infrared or heat-sensing devices and so-called "ferreting" devices for eavesdropping on electromagnetic signals.

## Intercept 'Talk'

THESE "FERRETING" devices are electronic and electromagnetic eavesdroppers that pick up radio and radar signals transmitted between two stations on earth. These signals, in effect, represent "talk." Ferreting them out can be likened to plucking "airwaves" from between a commercial TV or radio transmitter, such as that of WTOP-TV at Broadcast House, and a homeowners' radio or televison receiver. The U-2 planes carried important "ferreting" equipment as well as cameras, and other American "ferreting" instruments are known to be in place in various areas of the free world.

It is not altogether clear whether these ferreting devices are carried aloft only in Samos or fly in special spy satellites of their own too. There is some indication that ferret satellites are complementing Samos satellites, just as the information from photographic sensing would complement information from electronic sensing.

As became so painfully evident during World War II, and again during the Cuban crisis, spy photos and other images are only as good as the human interpreting them. Ralph Lapp has warned, for example, that in looking for Soviet space boosters, "I hope that we would not be fooled by a Potemkin rocket built specifically to delude us."

Eventually, the overworked human interpreter can expect help from machines. Engineers and scientists are already hard at work developing character recognition machines that will be able to tell a mountain from a molehill. Coupled with high-speed computers, these future scanners should be able to "read" miles of film strips and flag something that was not seen before. Then the human interpreter can decide what it is.

## One-Sided View

OFTEN, SO IT would seem, what is "spotted" on aerial or space photos is in the proverbial eye of the beholder. For example, Government intelligence agents once distributed to industrial teams a series of U-2 photos showing an electronic installation in the Soviet Union. The Government agents wanted to identify the exact type of installation.

As it turned out, one industrial team, producing one type of the equipment photographed, said the Soviets were duplicating their work. And another industrial team, developing a different type of equipment, swore that the Soviets were duplicating their work.

A similar one-sided view of things appears to have caught up the Administration in a debate over a Samos photo of a suspicious plant in Red China.

One set of Government experts has identified it as a gaseous diffusion plant for producing special nuclear materials. A group of physicists disagrees, and argues that the Red Chinese wouldn't take this costly and laborious route to the atom bomb anyway—not when plutonium bombs are cheaper and quicker to make and don't require a huge diffusion plant.

In the broadest sense, Samos space photography is a historical and evolutionary extension of balloon photography pioneered by the French more than a century ago and used in the American Civil War. But it still presents a formidable challenge. This is why:

Samos travels in a north-south path around the world at 17,000 miles an hour. The world, meanwhile, is traveling west to east at better than 1000 miles per hour. One writer has likened Samos's task to that of "trying to photograph a horse race from a moving elevator."

Moreover, Samos shoots pictures, presumably on continuous strip film, from about 150 miles above the earth. To get a picture of a missile from this height would be like trying to photograph an object in Washington half the size of the Washington Monument from the top of City Hall in Philadelphia.

## Other Hurdles

THERE IS THE problem of clouds and darkness, too. Rochlin has estimated that on the average, the earth is 60 per cent covered by clouds "so that the satellite will see the sunlit surface of the earth only about 20 per cent of the time."

For example, he says, "there is statistically only about one chance in 20 that the noon skies over Moscow will be less than 75 per cent covered with clouds."

But it is now apparent that United States scientists and engineers have overcome most of these hurdles. They appear to have developed an orbiting stabilized platform carrying a massive camera capable of returning pictures from 150 miles altitude that are as good as those returned from the U-2 at 70,000 feet.

To achieve this success, American experts apparently have employed a mixed bag of photographic and engineering tricks. They have stabilized the Samos so that one camera always points toward the earth and another points toward the stars. Presumably, every time a picture is taken of the earth, a picture is also taken of the stars. In this way, photo analysts can get a precise "fix" on an area photographed.

The experts have also employed so-called image motion compensation techniques to reduce blur to a minimum. They have combined these techniques with high-speed optics, superfast film and special sensitive film emulsions to reduce blurring further.

## Focal Length Magic

BUT THE KEY to the success, apparently, has been the development of cameras with enormous focal length. Technically, focal length is the distance from the lens to the film. A photographer's rule of thumb is: the greater the focal length, the better the resolution from afar.

By "resolution" is meant the degree of detail with which objects on the ground can be detected and identified; that is, how easily an object can be resolved from the adjoining detail.

During World War II, the Air Force used massive, 1500-pound aerial cameras with a 48-inch focal length. By 1960, according to Amrom H. Katz of the Rand Corp. in an unclassified article, "camera lenses of at least 100-inch and 240-inch focal length" had been developed by the United States Air Force.

Obviously these cameras would be such huge monsters that lofting them into space would be a problem. Again, scientific ingenuity seems to have overcome this challenge through a technique called "folded optics." What this means, essentially, is that light is folded back and forth between mirrors before it reaches the film. This accordion approach permits long-focal-length cameras that can be comfortably carried in a Samos satellite.

In May, 1960, shortly after Powers was downed over the Soviet Union, President Eisenhower showed a photograph on television that had been snapped from 13 miles above the earth. The photograph was good enough to permit the resolution of 4-inch painted stripes in a parking lot of a San Diego air base. That was the state of technology in 1956 when the picture was taken. Technology now may permit similar resolution from a satellite orbiting 150 miles overhead.

Certainly expert opinion on what can be achieved from on high suggests as much. Hence, in the April, 1960, issue of International Science and Technology, Harold S. Stewart, a University of Rochester optics expert, indicated that it was entirely possible to develop spy-in-the-sky cameras capable of "resolving two objects three inches apart from 125 miles up."

AS GOOD AS TODAY'S Samos appears to be, from available clues, there are better things to come: not only better photographic satellites, but better cameras, better film and better ways to interrogate satellites, process the information and analyze it.

Take, for example, the proposed Samos television system that would make it possible for ground stations to ask a Samos what it has learned each time it passes overhead. An adequate, though still relatively crude, system has been used successfully in the well-publicized United States weather satellites. Now, a far more sophisticated system has been perfected for America's next series of weather satellites.

This system is called "APT" for Automatic Picture Transmission. Essentially, it provides a television system that takes pictures of the earth's cloud cover over 1000-square-mile areas and transmits the pictures automatically and continuously to simple, inexpensive ground stations within "sight" of the spacecraft.

Presumably, a similar but more advanced system geared to the wants of a photo reconnaissance satellite is being developed. What this will mean, of course, is that Samos satellites will be able to stay aloft for months, televising earthly activity continuously.

As it is now, the amount of film that can be carried aloft in Samos has limited the satellite's useful life. Television has its limitations, too.

Katz, for example, calculated in his 1960 article what could be done by a 36-inch focal length system covering an angle of about 90 degrees from about 150 miles altitude — through either single-lens panoramic techniques or through a multiple-camera installation.

It could cover about six million square miles per day and consume at least 3000 feet of 9-inch-wide film. This amount of information would require about three months to transmit, working 24 hours a day.

Katz suggested that physical recovery of a film payload, such as the 3000 feet of 9-inch-wide film, "produces a given amount of information faster than it can be delivered by video link." But, he concluded, the two systems will be needed to complement one another.

Katz said all this in a definitive 35-page, six-part booklet entitled "Observation Satellites: Problems and Prospects." His monumental work, dated May 25, 1959, for Rand, an Air Force "think factory," was published in successive monthly issues of Astronautics, April through October, 1960. If the same series of studies were written today, there is little doubt that they would be stamped top secret and never reach the public.

As Katz saw it then, and there is no reason to believe he has changed his will be entire families of observation satellites of different types, some of which return to earth physically with information and others which, performing a surveillance function, send the required information back by video link."

## How About Russia?

HOW MUCH THE Soviet Union knows about the Samos, beyond the fact that it is in action, is a matter of conjecture. It is a fact that an early Samos went awry and may have accidentally ejected a film pack over the Soviet Arctic. Whether this did occur and whether, if so, the Soviets recovered the films, is not known.

That the Soviets know a great deal about aerial and space photography is evident from their remote televised pictures of the back side of the moon, taken in 1959.

That Soviet satellites are taking pictures, too, can be reasonably assumed from the Khrushchev and Adzhubei comments and from remarks such as this one last September by Edward Welsh, executive secretary of the National Aeronautics and Space Administration:

"It would be stupid to conclude," he said, "that they have not been making observations."

To Americans, it may seem odd that the Soviets think it necessary to spy from the sky, so open is the United States. Perhaps they want to match what their two-legged agents learn with what a roving camera eye sees—especially of missile-site areas now closed to Communist bloc diplomats. Or they might be perfecting a reconnaissance satellite system to police Red China and other areas of the world.

Or, again, they may find satellites a highly profitable method of electronic eavesdropping, as with the "ferret" system. Pictures alone are highly useful, but complete intelligence requires the added dimensions provided by electronics as well as the human eye.

WHY, TOO, ONE might ask, doesn't the Soviet Union try to knock down Samos, as it did Francis Gary Powers's U-2, or, for that matter, why doesn't the United States knock down a Soviet spy satellite?

One answer is that, as far as is known, neither nation now possesses an operational system to pick off a satellite in orbit, though the capability can be developed. In the Russian book "Soviet Military Strategy," it is stated that "since reconnaissance satellites moving in definite orbits can be destroyed, maneuverable manned space vehicles with various reconnaissance devices are planned." The reference appears to be to American plans.

Orbiting satellites, indeed, are easy marks. This is so because their travel around the earth can be predicted well in advance. But orbiting satellites might not always be proverbial fish in a barrel.

Once satellites are given propulsive power of their own to maneuver in space, the hunt will become far tougher. Russia's Polyot I, sent aloft Nov. 1, was reported by the Soviets to be able to maneuver.

BUT THE CHALLENGE, technologically, is merely the development of an antisatellite missile and the means to have it locate and chase a satellite through the heavens. There is also the problem of knowing which satellite to kill, for presumably neither the Russians nor the Americans would want to knock down all satellites—weather, communications, scientific.

For some years now the United States has been developing a snooper satellite for this purpose. Originally it was called Saint, but religious groups protested and the name Saint (for Satellite Inspector) was dropped.

The aim of the late Saint Project was to design a satellite that could meet up with a suspect satellite in orbit, sniff or inspect the other satellite and tell what it found to ground stations. A more advanced version would presumably also have some kill capability, which could be simply putting the snatch on the other satellite and pulling it into the earth's atmosphere where both satellites would be destroyed.

A satellite inspector would require a high degree of maneuverability and, more significantly, sensors or detection devices that somehow could X-ray the suspect satellite to determine whether it had a hostile or peaceful purpose. It is little wonder, therefore, that the satellite inspector program has been slow in developing.

For quite a long time the Soviet Union has insisted, whenever the United Nations was considering the peaceful uses of space, that spies-in-the-sky be blacklisted. Just as doggedly, the United States has resisted such moves. Little was said out loud about the rival satellite reconnaissance systems but Moscow and Washington each knew what the other was talking about.

Then, rather suddenly, in November, the Russians dropped their insistence on a ban on observation or spy-in-the-sky satellites. This made possible Soviet-American agreement on a resolution for the peaceful uses of space.

The belief here is that the Russians changed their position because they are busy developing a capability comparable to Samos and therefore do not want to be inhibited by international agreements in the use of such devices.

Thus, in a sense, Samos has now come of age, though it still remains a highly secret instrument of vast and increasing importance to the United States and the free world. And because of the new turn in Soviet policy, as well as because of what the Russians have said about this new use of science, the story of Samos could be told today.