TECHNOLOGY

Past-Seeking Camera

Cameras that can "see" and photograph not only present events, but also past events help to guard the security of the United States, Lillian Levy reports.

See Front Cover

➤ A CAMERA that can "see" what already has happened as well as what is happening may have provided the United States with information on missile bases in Cuba. Such devices believed to be used in Cuba and elsewhere in the world are watching over the present and future security of the United States, and the rest of the Free World, SCIENCE SERVICE learned.

The air-borne infrared "eye," operated electronically, can look down at night from an altitude of more than 40,000 feet to a space on earth, such as a Cuban missile site, and reflect images of the people and equipment not then present but that were on the site earlier in the day. Developed by Department of Defense scientists and photo-technicians about four years ago, the past searching device operates like a TV camera. Focused at an empty parking lot, for example, it will provide a kinescope image of the cars that had been parked there. As these images are reflected, they are rephotographed by a still camera for permanent record and detailed study.

Special photographic plates are sensitive to heat (infra-red) radiation and the past presence of objects is shown differentially.

This is only one of the many unique photo-devices developed for the defense of the United States.

Aerial photographs taken before "quarantine" using a camera with telescopic lens, probably at altitudes above 60,000 feet over Cuban jungles, clearly show launching pads and intermediate range missiles obviously of an offensive military nature.

See on this week's front cover a picture of a medium range ballistic missile base in Cuba.

An aerial shot of New York taken with the same type camera at about 40,000 feet altitude was enlarged many times so that city blocks were distinguishable. Photo experts then enlarged a segment of the photo containing one block, selected a house pictured in the enlargement for further processing and enlarging. This super-enlargement showed a man sitting in the yard in back of the house reading a newspaper; and still further enlarging enabled viewers to make out the headline of the paper.

The Cuban pictures shown to President Kennedy before his decision to "quarantine" Cuba from delivery of offensive weapons are reproduced in this issue.

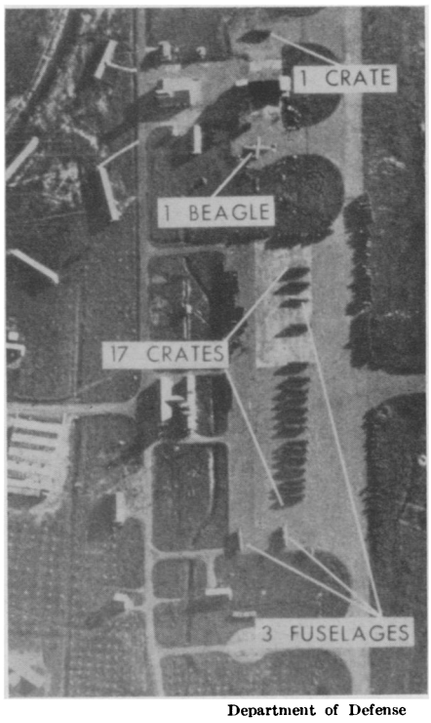
Those who saw the photographs, marvelled at the visible detail which made it possible to identify 28 Soviet subsonic Ilyushan planes crated and partially assembled on Cuban territory.

The Air Force has developed a "Cat Eye" electronic system which enables airmen to see in the dark by reproducing a TV type picture on a cathode ray tube. It is an extremely useful reconnaissance tool.

The system is 1,000 times more sensitive than a standard TV camera and can produce clear, sharp images under the poorest lighting conditions, with lighting even less than that from the glow of a burning cigarette tip in the dark.

Used with a telescope, the Cat Eye has taken daylight pictures of the stars and planets, previously impossible to get. Air Force researchers believe that Cat Eye used with a 24-inch diameter telescope aimed at Mars may be able to photograph that planet's canals and reveal their nature. Astronomers are hopeful that this device, designed primarily for military reconnaissance, will reveal new scientific knowledge about the heavens.

The Cat Eye senses and amplifies the always present light unseen by the human eye and using this light produces images on a photosensitive surface. By reamplification and acceleration, the signal is transferred on the cathode ray tube. Cat Eye works, in effect, like the contrast control on a TV set which permits the viewer to sharpen the picture. Primarily used for black and white reproductions, it can be adapted for color reproductions that come through clearly even on a moonless, dark winter night.



Department of Defense

"EYES" OVER CUBA—Photograph shows Soviet light jet bombers (Beagle) being uncrated and assembled in Cuba.

The U.S. also has a facet-eye camera, with 25 slender barreled five-inch telescopic lenses which can track a missile from ground into the air at a distance from 1 million to 3 million feet. This camera also can be used to study the stars and planets and has taken pictures of the moon.

Special camera lens also are used in conjunction with radar. These are used for missile and satellite tracking and are highly essential for recording the first moments of manned launches.

Until World War II, the U.S. had almost no capability in photo interpretation for aerial photo reconnaissance. Since then, literally thousands of such experts have been trained and have been able to use this skill in civilian pursuits in geology, archaeology, soil science, hydrology, geography, agriculture and even urban development.

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MILITARY SCIENCE

Southern Radar Net Has Been Strengthened

➤ HOW MUCH has the radar defense net in southern United States improved since a Cuban bomber landed undetected by radar at Daytona Beach, Fla., in 1959?

An Air Force spokesman answering the question stated that there "has been some reinforcement of radar weaknesses" in the South since then, adding that the gaps in the radar net have been filled. He did not elaborate further.

Ironically, the Cuban bomber, with two pilots aboard, landed in Daytona at a time when former Cuban military and Government officials of Dictator Fulgencio Batista were fleeing from Fidel Castro.

The chance of such an incident happening again "is not very possible in this day and age," the Air Force said. They emphasized this by pointing out the success of Project "Skyshield," a recent exercise to test the effectiveness of the radar defense, and the reshuffling of the Air Force air defense in view of the Cuban crisis.

The distinct possibility of Russian-made missiles striking various U.S. centers from Cuba has given added importance to the southern radar net.

In the past, the greatest potential threat has been assumed to be from the North. Hence, the chain of northern radar networks, such as the Ballistic Missile Early Warning System (BMEWS).

However, "because of increased air defense capability and in accordance with previous plans," the Air Force had stepped up its radar network along Florida and the Gulf of Mexico.

The Ballistic Missile Early Warning System consists of three radar bases scanning the skies and sending its beams into Russia. One is located in Thule, Greenland, the second in Clear, Alaska, and the third is in England. The BMEWS is still not completely finished and the date of completion is still under security wraps.

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