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U.S. Easily Intercepts Luna Photos, But Officials Won't Admit Doing It

By Martin Weil
Washington Post Staff Writer

U.S. Government intelligence agencies are intercepting and receiving Luna 9's photographs from the moon as part of a routine monitoring of Soviet space activities, informed sources hinted here yesterday.

"For security reasons, I cannot say that we are receiving the pictures, but any country as interested in space as the United States would be derelict in its duty if it were not," was one Government official's comment.

It is generally known that the U.S. tracks and even "eavesdrops" on all Soviet space activities, including all Soviet satellites passing over America.

CPYRGHT

Tracking Network

The Defense Department maintains a complicated electronic tracking network for this purpose. Information collected by this network on several occasions enabled U.S. diplomats to tell the world about some of the failures of the Soviet space program.

But except for such strategically selected situations, data about Soviet space activities is not in general divulged by the U.S.

Behind this policy is the rationale of not revealing the precise nature and capability of the U.S. space intelligence system.

To a sophisticated electronic detection system, snatching Luna's transmissions out of space, and reconstructing Luna's moon photographs should be relative child's play.

But if the sender is eager to keep his messages from space private, he can make life difficult for an uninvited receiver. Transmission frequencies can be hidden. Intricate codes can be used to so distort the signals from space that — if they can be detected at all — they resemble nothing but static.

The extent of the U.S. capability to find the hidden static, and to make it yield its secrets, is something which the Government will not disclose.

Experts suggest that information returned by Soviet spacecraft is not always coded. They speculate that occasionally the Soviets may actually want the world to know what is being sent.

Sir Bernard Lovell, the British radio astronomer, noted yesterday that the Russians "appear to have made it possible in every way for us to receive these pictures" by announcing the frequency and transmitting uncoded and on standard scanning lines. He reasoned that they wanted the British, with their more sensitive telescope, to copy the transmission.

Experts in telemetry say the basic problem of taking a picture on the moon and sending it back to earth is no more complex than creating a domestic television system.

Space No Barrier

Only modest extensions of the same technique that put TV performers into our living rooms are necessary to put the lunar landscape into earthbound laboratories.

The major difference is distance. But to electromagnetic waves, darting through the void at 186,000 miles per second, space presents no real barrier. And it is these bundles of energy which carry the messages from the moon.

The basic step in the feat is converting the light and shadow of the lunar landscape into pulses of electrical energy.

Solution of similar problems is what makes television possible. Lenses form an image—in this case, of the moon—on a light sensitive screen. This screen reacts electrically to what it sees, and transforms bright light into high voltage, dimness into low voltage.

Here, Luna's television system differs from that of the U.S. Mariner Mars probe, and is similar to that of the Ranger moon probes.

Mariner sent back discreet "bits" of informataion. These "bits" answered yes or no to the question — does this part of the picture have this particular shade of gray?

But the intensities of Luna's signals, like those of Ranger's are direct measures of the shading of the landscape.

Voltages Scanned

Then the voltages are read off the screen by a moving beam of electrons, which creates a continuous electrical signal—strong where the voltage is high and weak where the voltage is low.

Next the signals are sent back to earth on a beam of electrial energy.

Beaming back the signals takes little power. For example, most electric light bulbs consume more power than did the transmitter of the Ranger, the U.S. spacecraft which sent back pictures of the moon.

Although the signals are generally aimed in the direction of the earth, it is virtually impossible to confine their landing point to the borders of any one country. The beam spreads too much over the 244,000 miles between earth and moon.

Thus tracking stations in many countries, so long as observers there can see the Luna landing site on the moon directly, can pick up the signals.

And a parabolic antenna—a "dish" can gather them together. A dish about 30 feet across should be able to gather enough energy to get a clear signal, that stands out from the stray noise of space.

Once this signal is received by the antenna, the next step is to convert it back into a pattern of light and shadow.

Again, a chemically treated screen is used. It responds to electrical energy by giving off a glow of light. The stronger the signal, the more the energy, the brighter the glow.

When all of the signals have hit the screen and have been converted into minute patches of black, white, or gray, the result, viewed as a whole, is a reproduction of the original lunar landscape.

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