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Encoded Soviet Missile Data Seen a Threat by Some Here

By Walter Pincus

Washington Post Staff Writer

When a Soviet test intercontinental ballistic missile is fired from the Tyuratam launch site in Central Asia, it sends back to Soviet scientists on the ground a constant stream of electronic reports on how the weapon is functioning.

This information, on speed, pressure, temperature and other factors, is called telemetry. In the case of a test malfunction, telemetry helps Soviet scientists determine what went wrong.

From electronic listening posts to the south of Tyuratam—in Turkey and more recently Iran—U.S. intelligence units listen in and record that same Soviet missile telemetry. The listening aids U.S. analysts in determining the size and throw-weight of the test missile along with its range, likely payload and possible accuracy of the warheads.

But last June, American analysts monitoring a Soviet test of an SS18 missile noticed that some of the telemetry was being transmitted in code—a development that some U.S. officials saw as a threat to a new strategic arms limitation treaty (SALT).

CIA Director Stansfield Turner, for example, insisted that the encoding had to stop or he would not be able to testify at future congressional hearings that the Soviets were living up to the provisions of the arms control treaty being negotiated between the United States and the Soviet Union.

In Geneva today, Soviet Foreign Minister Andrei A. Gromyko and Secretary of State Cyrus R. Vance are to meet to discuss the final details of a SALT II accord. One of the details discussed will be a proposed provision barring either side from encoding its test missile telemetry.

The SALT II agreement already includes a provision requiring each country not to interfere with the other's "national technical means" of intelligence gathering—such as electronic listening posts. But that provision is ambiguous and does not state whether encoding of telemetry constitutes interference.

On Capitol Hill, Sen. John H. Glenn Jr. (D-Ohio) for more than a year had argued that adequate verification was key to getting his and other senators' support for SALT. Alerted to the Soviet Union's encoding of test missile data, Glenn pressed the administration to negotiate a clear understanding that there would be no further telemetry

intercepted telemetry is only one of many highly classified intelligence activities that allow the United States to keep track of the Soviet submarine and land-based ICBM missiles, bomber deployments and their strategic weapons research programs.

Before that SS18 missile launch last June, U.S. electronic interceptions already had provided advance notice that the test would take place.

A U.S. satellite, which hovers in space orbit continuously over the Indian Ocean, has infrared sensors that pick up heat emissions from the earth. When the SS18 test missile was launched, the U.S. satellite detected it within seconds of liftoff.

The infrared satellite sensor can follow the missile as its first stage carries it above the clouds, but loses it before it leaves the atmosphere.

In space, the Soviet missile is followed by powerful ground-based radar. Facilities in Diyarbakir, Turkey, were used until July 1975, when that country's government closed down U.S. intelligence operations pending resolution of U.S. military assistance programs.

Thereafter, a temporary radar installation was reportedly built in Iran to follow Soviet ICBM test flights as they went across central Asia toward an impact zone on the Kamchatka Peninsula, north of Japan, or into the North Pacific.

During the initial launch and as the missile's upper stage travels in space, the telemetry monitoring takes place. With a missile containing multiple independently targeted reentry vehicles (MIRV), telemetry can indicate when each warhead is released. The ground-based radar in Iran also records that operation.

At Shemya Air Force Base in the Aleutian Islands off Alaska, the United States has a large phased-array radar that watches the Soviet warheads as they re-enter the earth's atmosphere and hit the ground at Kamchatka, 500 miles away.

The Shemya facility, according to the authoritative "Jane's Weapons Systems," can see something the size of a basketball 2,000 miles away, track 100 objects simultaneously and record detailed information on up to 20 targets.

The United States has also built a phased-array radar farther south in the Pacific on Kwajalein in the Marshall Islands. Another less powerful radar unit is aboard a specially designed ship to follow those longer-range shots that land in the Pacific

missile tests is only one part of the SALT verification program.

U.S. satellites capable of taking extremely detailed photographs from 100 miles and up regularly cover the Soviet Union.

They are used to keep track of long-term weapons building programs—such as missile submarine construction and construction of land-based ICBM sites.

More than high-resolution photography, however, is transmitted back by these satellites.

Some satellites turn colors into electrical signals and then digital data. When reconstructed, they are assigned to different colors. Such a system makes camouflaged sites easier to discover, since paint gives off a different signal than the natural trees, leaves or grass it is supposed to represent.

Reconnaissance satellites also have infrared sensors, and some are equipped to pick up radioactive material.

Newer satellites can beam their information back to earth directly by radio after turning developed film into electronic impulses. The older method is also still used—dropping exposed film from space in a capsule that is recovered by aircraft.

Since the early 1970s, the CIA has chaired a SALT verification committee made up of senior intelligence analysts from the agency, State and Defense departments. Using all the intelligence collection activities, this group has attempted to keep track of all phases of the Soviet strategic program.

The 1972 SALT I agreement—like the one now being negotiated—prohibited deliberate concealment and interference with national technical means of verification, such as electronic and other collection systems.

Soviet encoding of telemetry shortly after the 1972 agreement was publicized in the United States as a violation of SALT I. The Soviets denied that, saying that the hidden information was not relevant to the agreement. Thereafter, however, they halted the encoding, and resumed it only sporadically over the next six years.

The June incident, however, convinced U.S. negotiators that the agreement needed further language to define more completely what is meant by interference.

According to informed sources, that new definition will modify the