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Report by Ustinov on the Alleged US Ability to Disrupt Soviet Missile Guidance

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Summary:

Ustinov analyzes reports that American scientists have developed a method for disrupting the guidance systems on Soviet missiles and concludes that this is not possible.

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In accordance with instructions, I report on the results of the examination of the question of the apparent discovery by American scientists of the ability to disrupt the guidance of Soviet missiles, as reported by cde. Shelepin, as well as the TASS bulletin from 18 July 1960.

The examination of this question included a number of scientists and specialists in the field of missile guidance (academicians Keldysh and Shchukin, corresponding members of the USSR Academy of Sciences--Pilyugin and Ryazanskii, and other specialists).

Cde. Shelepin's report and the TASS bulletin point to the dispersal of information among ruling officials in the USA and England that American and English scientists have apparently discovered a method for disrupting the guidance of Soviet missiles during launch by means of radio waves emitted from a distance and that, as a result of this, not a single missile would reach its target.

Cde. Shelepin's report does not specify the missile mechanisms that would be affected by the radio waves. The TASS bulletin mentions the possibility of disrupting electronic signals produced by gyroscopes, i.e. the electro-mechanical and not the radio-electronic elements of the guidance system.

In the opinion of our leading specialists in the field of missile guidance, the truth of this assertion is improbable.

The electronic signals produced by gyroscopic guidance elements operate on significantly more power than the power of the radio disruptions that may be directed at our missile from the ground, from a balloon or another missile.

These electronic signals are not produced on radio frequencies, but rather on low frequencies that cannot be significantly affected by radio frequency fluctuations, even of these were equivalent in power.

All electric circuits carrying electronic signals from gyroscopic installations are all carefully shielded from theeffects of very powerful electric or radio disruptions produced by the electronic mechanisms, engine installations and radio devices of the missiles themselves, so that radio waves and electric fluctuations would be essentially unable to penetrate these circuits.

Consequently, it is impossible, in the opinion of our scientists, to create radio disruptions for missiles guided only by inertial gyroscopic systems and program mechanisms on board the missile. Thus, it is only necessary to guard against radio disruptions produced by the enemy only with respect to the radio guidance systems employed in some of our missiles.

At the present time, a number of essential ballistic missiles being developed or currently in the arsenal of the Soviet Army have only inertial guidance systems. These include: intercontinental missiles R-16 and R-26 [note in margin referring to R-26: "not produced"], R-14 missile with the of 4000 km, R-12 missile with the range

of 2000 km; tactical missiles R-11, R-11 M, R-17, as well as ballistic missiles designed for submarines R-11F,. R-13, R-21 and D-6.

The intercontinental ballistic missiles R-7A and R-9A, as well as the R-5M missile with the range of 1200 km employ radio correctives to insure impact on target with a high degree of accuracy. In addition to radio guidance elements, the R-7A and R-9A missiles carry a gyroscope guidance system, so that a breakdown of the radio system as a result of radio disruption would cause the error to increase by only 30-40 km along the trajectory path. Moreover, the error away from the trajectory path would remain the same, since the radio system corrects only the distance of the missile flight, while its accuracy away from the trajectory path is insured by the inertial gyroscopic system.

In order to hinder the enemy from disrupting the radio guidance system of the R-7A and R-9 missiles, this system is engaged only 20 sec. prior to the engagement of the final stage engine. Moreover, the frequency transmitted by the missile and the frequency transmitted from the ground system guiding the distance accuracy are different. Consequently, if the enemy discovers, from a significant distance, the transmission from the missile as a result of the height of its flight path, he will not be able to create disruptions for the missile unless he knows beforehand the frequency employed by the ground system.

In addition, noting the distance of our launch pads from the borders, the creation of significant disruptions to the radio guidance would require the use of antennas with significant directivity and power, measured in thousands of kilowatts, so as to really decrease the accuracy of its hit.

Consequently, no sources of radio disruptions from balloons or missiles may disrupt the guidance of our missiles.

The R-5M [Korolev] missile, which will be gradually replaced by the R-12 [Yangel] missile that does not carry a radio guidance system, does not have radio wave emission from the missile itself. Bearing in mind the direction of receiving antennae and the direction of the missile flight path, the enemy would require the use of extremely powerful radio disruptors.

Thus, the spread of reports in the USA and England regarding the possibility of disrupting our ballistic missiles upon launch so that none of them would reach its target, contradicts reality with respect to our missiles that employ radio channels in the guidance system.

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