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Army Contribution to GMAIC

for

SIC Estimate on Science & Technology

Terms of Reference - Appendix C, Ib, a & c

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Present and Future Capabilities in Military Research and Development

1. Air Defense Missiles

a. We have seen the rapid Soviet improvement of their medium and high altitude air defense capability from the static, dense, and costly SA-1 complex around Moscow to the highly mobile SA-2 system which affords medium and high altitude protection to the Soviet field army and many important cities, industrial complexes and military centers. The SA-3 low altitude system is currently believed to be in the process of deployment and it is highly probable that the SA-2 system is undergoing capability improvements as this is the normal product improvement for any missile system. The Soviets have demonstrated considerable advancement in the past few years in the air defense field and their capability in the associated fields of nuclear physics, computers, and electronics both in manpower and equipment is large and of high calibre.

Future Soviet research in the surface-to-air missile systems will undoubtedly include extensive and exhaustive exploitation of exotic fuels and advanced propulsion systems; more accurate guidance systems with considerable resistance to electronic countermeasures (EGM); improved electronic acquisition and fire control systems and techniques; and, both conventional and unconventional warheads utilizing more sophisticated fuzing systems. The concept of employing and deploying SAM systems with the Soviet field armies will become increasingly more prominent within

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the next few years. Evidence indicates that the USSR possesses the scientific knowledge and technical skills to develop complex and elaborate systems for advanced missile air defense capability during the next 10 years.

c. ABM

The Soviets have recognized that the defense problem of the 1960 decade is defense against ballistic targets. According to Premier Khrushchev, the Soviets began developing defenses against ICBM's at the same time they started developing ICBM's. From the available evidence they are continuously and systematically developing defenses against Minuteman, Polaris, Pershing, free rockets and their equivalents. They have divided the threat spectrum into manageable parts and are developing just as many systems as it takes to handle each part. Present developments at Kapustin Yar, Sary Shagan, and on Kamchatka Peninsula suggest that three or more separate antimissile missile defense systems are under study.

3. Space Defense

a. The Antisatellite Mission

The view that U. S. space vehicles pose a significant threat to the USSR is widely held by the Soviets, as evidenced by their continuing propaganda to the effect that all U. S. space programs are military. Since it is obvious that they would like to prevent any satellite coverage of the USSR, it can be assumed that they are concerned with developing some means for destroying such vehicles.

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The general antisatellite mission is simply defined as the prevention of any military or ideological mission by the enemy through the utilization of satellites. The accomplishment of the mission may require physical destruction of some satellites, although certain vehicles may be neutralized by other means. The reconnaissance and surveillance missions which can be accomplished by ESV's and which support any and all military operations, constitute the threats of the present day and are of real concern to the Soviets.

During the time period under consideration (1961-66) U.S. satellites will pose only a general military threat to the USSR. Most will be programmed to orbit below 1,000 nautical miles since earth surveillance missions are more easily performed at lower altitudes. For this reason, and since the U.S. ballistic missile threat in this time period will be a very real one, the Soviets may feel that their AMM effort should not be diluted by the concurrent development of an anti-satellite system. The Soviets do, however, have the option of designing their AICBM system so as to maximize its antisatellite capabilities. Evidence on hand to date suggests that this may in fact be the Soviet approach.

b. Initial Antisatellite System

Events of the past year show that the Soviets will attempt to destroy objects crossing their territory. It is estimated therefore that the Soviets will try to achieve a limited antisatellite capability with the components of the AICBM system. This antimissile system

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Approved For Release 2002/01/30 : CIA-RDP79R00961A000700090007-5
equipment is specifically designed for split second timing and the antimissile missile would have a good likelihood of damaging a satellite either with conventional or nonconventional warheads. If this missile is employed with its 350 kiloton warhead it could intercept satellites at 200 NM altitude, doing severe damage to a radius of 15 NM and lesser damage to a radius of 100 NM. With a lighter 25 kiloton warhead, this missile could intercept satellites up to 300 NM. Such a limited capability could be achieved in a few months, provided the task was given top priority, utilizing existing hardware from research and development sites at Sary Shagan and Uka. Operations would be limited to the intercept of low orbit satellites sometime after the vehicles first orbit of the earth.

In addition if the Soviets chose to use nuclear warheads of large enough yield to offset the inaccuracies in launch timing, the SS-3, 4, or 5 could be utilized to interfere with hostile ESV's. This, however, is a less likely approach than the use of an AICBM interceptor.

c. Defensive satellites

The Soviet offensive space capability has been demonstrated and can be estimated for several years into the future. It is quite clear that the Soviets can build a defensive satellite just as quickly and just as complex as an offensive satellite. The space technology is available and the Soviet government can apply it to either defensive or offensive

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If the Soviets decide to build a defensive satellite, this vehicle will probably have a dual mission. It will assess the threat which a U.S. satellite represents by effecting a co-orbital interrogation. Then, if the assessment warrants immediate neutralization the inspector-interrogator satellite will take appropriate measures (kill, jam, deflect from orbit, or otherwise neutralize).

In the light of their space accomplishments to date, the Soviets can conceivably develop an unmanned inspector-interrogator, satellite by 1963-65 and a manned type after 1965.

The components of equipment at Sary Shagan and Uka may have the capabilities today which could be employed in the launching and initial control of such defensive satellites. The type of defensive satellite being estimated has its complexity in the space vehicle itself not in the launch and initial control facilities. The basic capability of the USSR to put large payloads into orbit gives them a head start toward developing defensive satellites. With a large payload, the defensive satellite can be less complex.

No evidence has as yet been uncovered which indicates that the USSR is actually developing a space based defensive system.

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