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DIGEST

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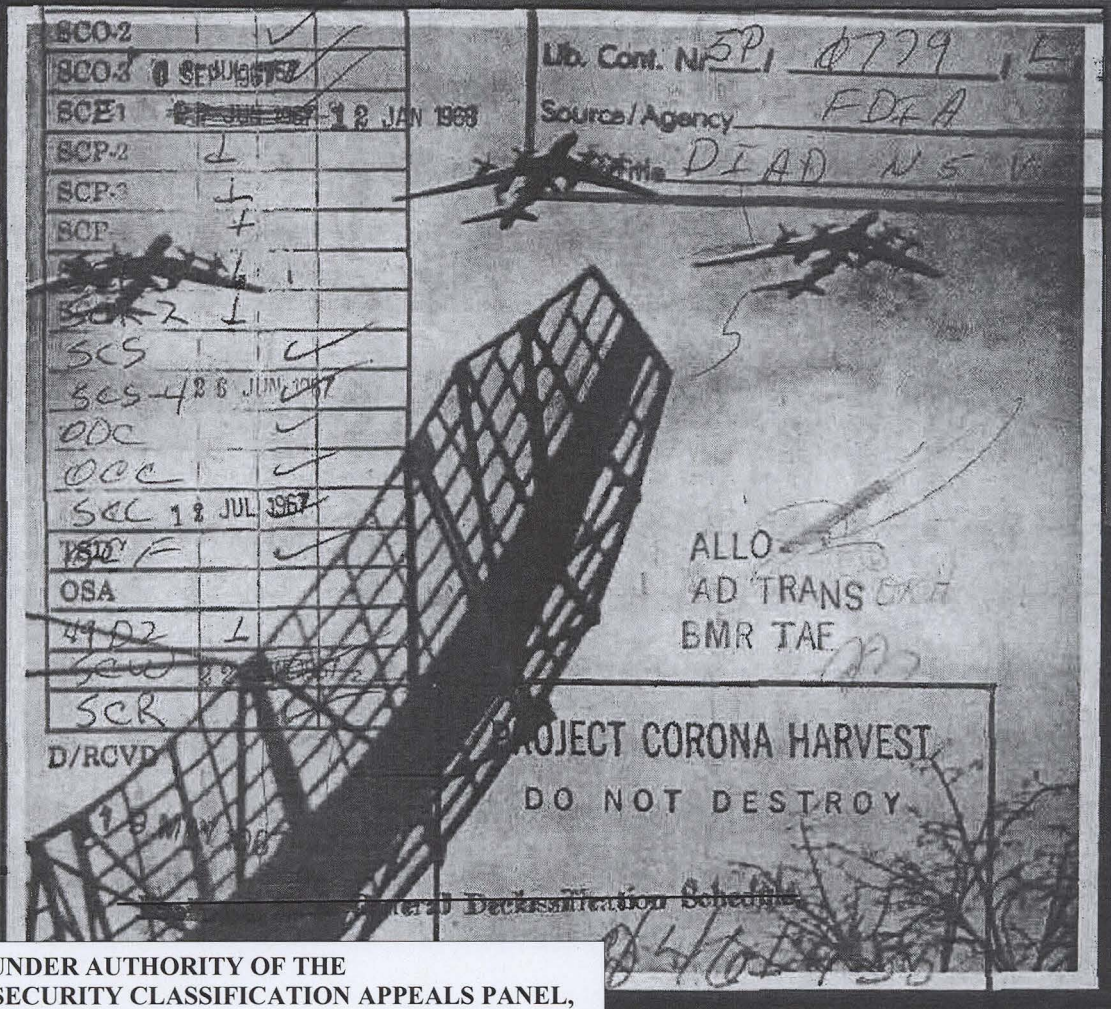
May 1967 • Volume 5 • Number 5



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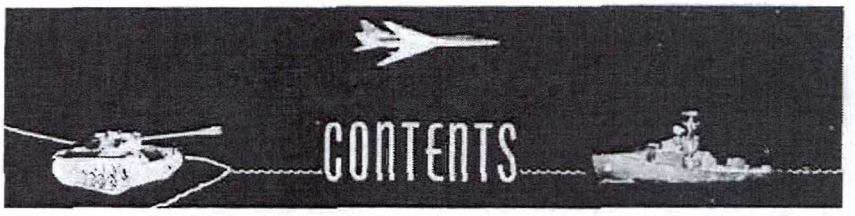

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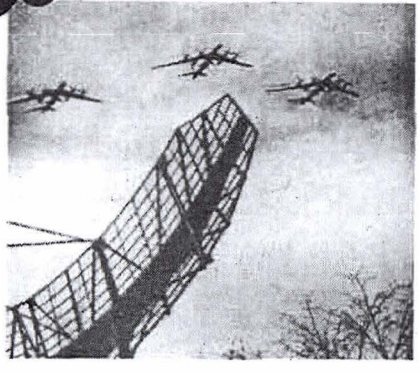

THE COVER

SOVIET Tu-95 (Bear) swept-wing, four-engine turboprop heavy bombers in flyby over a ground radar station. Bomber aircraft and electronic equipment are basic elements of the modern warfare doctrine of the USSR. Soviet R&D in both areas has led to the establishment of effective airborne ECM tactics—chaff corridors—against search and height finder radars and to the deployment of sophisticated new radars with extensive variations of the basic radar parameters. New complex modulation radar techniques offer accurate target discrimination, greater resistance to interference and jamming, and considerably better performance. For more details in these areas see "Chaff: A Major Factor in Soviet Airborne ECM Tactics," beginning on page 24, and "Soviets Employ New Radar Techniques," on page 26. ~~[S]~~

FOREWORD

MISSION: The mission of the monthly *Defense Intelligence Digest* is to provide all components of the Department of Defense and other United States agencies with timely intelligence of wide professional interest on significant developments and trends in the military capabilities and vulnerabilities of foreign nations. Emphasis is placed primarily on nations and forces within the Communist World.

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Joseph F. Carroll

JOSEPH F. CARROLL
Lt General, USAF
Director

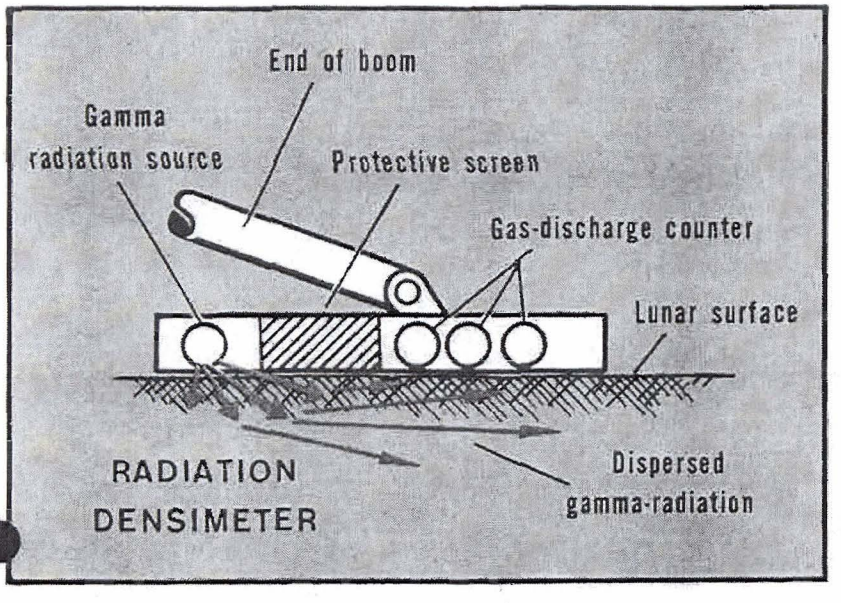
More sophisticated than its predecessor, Luna 13 yields valuable data for possible manned lunar exploration, but a true soft landing still remains in the Soviet space future

LUNA 13—A QUALIFIED SOVIET SPACE SUCCESS

On 24 December 1966, Luna 13 achieved the Soviet Union's second controlled semisoft landing on the moon's surface. The vehicle, a possible forerunner of manned lunar missions, tested the load-bearing capacity of the moon's surface. The probable sixth in the USSR's series of soft or semisoft landing attempts, it was only the second success.

Luna 13 was launched from the Tyuratam Missile Test Range on 21 December by the SL-6 launch system. This system, used for all Soviet lunar probes since 1963, consists of an SS-6 booster/sustainer, a Venik third stage, and an interplanetary fourth stage. From a nominal 52-degree earth parking orbit the vehicle was injected into a lunar trajectory. After a nominal 80-hour flight, which included a midcourse corrective maneuver, its retrorockets were ignited approximately 38 nautical miles above the moon's surface. The payload, encased in a shock-absorbing shroud, bounced onto the lunar surface in the area known as the Sea of Storms. When it came to rest, the outer protective layer peeled back in four segments to provide the base for the instrument package.

According to Soviet press comments, the Luna 13 capsule resembled that of its predecessor, Luna 9. The latter capsule was a two-foot sphere that, in January 1966, became the first payload to land intact on the lunar surface. At approximately 220 pounds, the Luna 9 capsule weighed about a third as much as the US Surveyor 1, which made the first true soft landing on the moon in June 1966.



Luna 13 differed from Luna 9 in that the more recent vehicle was equipped with two instrument deployment booms. Mounted on the end of one boom was a mechanical surface test meter or penetrometer; a radiation densimeter was mounted on the other. The antennas and booms of Luna 13 were deployed by an onboard timer approximately four minutes after the capsule came to rest.

The deployed television scanner of Luna 13 possessed a depth of field of from five feet to infinity and incorporated an automatic contrast adjustment system. It transmitted its first pictures of the lunar landscape on 25 December. Making a 360-degree sweep every 100 minutes, the scanner distinguished details .06 to .08 inch long at a distance of five feet. Photos of the lunar landscape processed by the Coordinating Computing Center in Moscow confirmed the Lunar 9 findings that the luna surface is not covered by a thick layer of dust.

The penetrometer consisted of a titanium-tipped rod and solid-propellant charge. The probe was driven 7.8 to 11.8 inches into the lunar soil with a known force of 15.4 lb/sec. On the basis of this experiment, the Soviets concluded that lunar soil has mechanical properties similar to those of earth soil of average density.

The radiation densimeter, deployed to a distance of approximately five feet from the capsule, consisted of a small gamma-radiation source and three gas-discharge gamma-quanta counters, separated by a protective screen. The intensity of the gamma rays dispersed by the lunar soil was equivalent to that of porous or granular, loosely bonded rock, and less than the density of average earth soil.

Soviet statements point to future soft landers or semisoft landers instrumented for detailed chemical and physical analyses of the lunar surface and subsurface. Possible experiments will include soil sampling, radiation measurements, soil weight-bearing strength determination, micrometeorite detection, and seismological recording. [END]