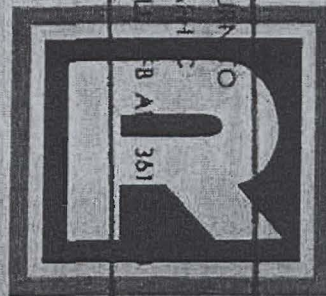
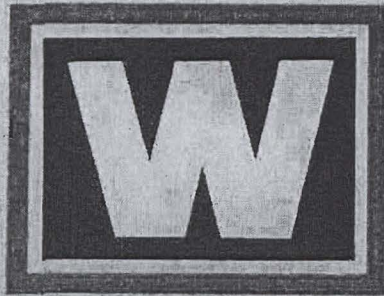




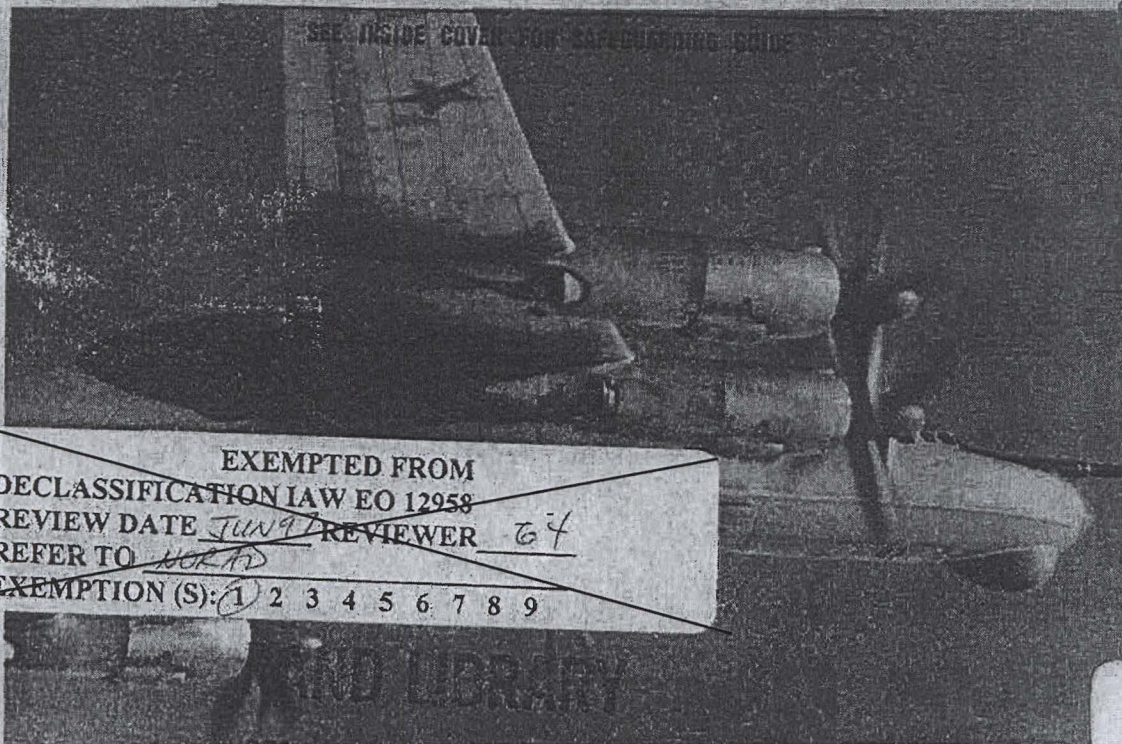
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Weekly
Intelligence
Review

Issue No. 25/67, 23 June 1967

The WIR in Brief

Portion identified as non-responsive to the appeal

Portion identified as non-responsive to the appeal

Space

COSMOS 166 PROBABLY A RESEARCH SATELLITE, AS ANNOUNCED BY SOVIETS

Parameters presented.

LAUNCH OF RECCE COSMOS 164 MAY HAVE BEEN RELATED TO MIDDLE-EAST CRISIS

Hurry in launch and de-orbit seems likely. FAILURE OF VENUS PROBE ATTEMPT CONCEALED UNDER NAME OF COSMOS 167

A third attempt may come soon. STUDIES OF WORKING METALS IN MAGNETIC FIELDS MAY LEAD TO SPACE-VEHICLE SHIELDING

May protect against gamma radiation. VENUS 4 WILL REQUIRE INFIGHT COURSE CORRECTION, TRAJECTORY ANALYSES SHOW

May miss planet by about 98,000 n.m. unless correction is made.

Portion identified as non-responsive to the appeal

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space

significant
intelligence
on space
developments
and trends

Cosmos 166 Probably a Research Satellite, as Announced by the Soviets

Cosmos 166, which the Soviets launched from the Kapustin Yar missile test range at about 0445Z, 16 June 1967, is probably a scientific-research satellite, as announced by the Soviets. The NORAD Space Defense Center has reported its orbital parameters as follows:

Inclination	48.8 degrees
Period	92.9 minutes
Apogee	578 kilometers (310 n.m.)
Perigee	283 kilometers (152 n.m.)

(NORAD)

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Launch of Recce Cosmos 164 May Have Been Related to Middle-East Crisis

The launch of Soviet reconnaissance satellite Cosmos 164 may have been associated in some way with the Middle East crisis. It was launched at about 1300Z, 8 June, while recce satellite 162 was still in orbit, and it was de-orbited only 6 days after launch instead of the usual 8 days.

It is not unprecedented for two Soviet recce satellites to overlap in flight time, or for one to be de-orbited before the usual 8 days in orbit. Both circumstances are unusual, however, and their joint occurrence with this satellite, which was launched shortly after the outbreak of Arab-Israeli fighting, raises the suspicion that Cosmos 164's mission was in some way related to the Middle East crisis. This vehicle carried a medium-resolution camera system and was capable of collecting ELINT. (Last week's WIR, in reporting the de-orbits of Cosmos 162 and Cosmos 164, erroneously said that Cosmos 162 was a medium-resolution satellite; it carried a high-resolution camera system.)

Cosmos 164 was the fourth Soviet photoreconnaissance satellite since

-7-

WIR 25/67 23 Jun 1967

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1962 to be de-orbited after less than the standard 8 days in orbit. The other three were Cosmoses 45, 48, and 129.

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Failure of Venus Probe Attempt Concealed Under Name of Cosmos 167

Following the launch of Venus 4 on 12 June 1967, the Soviets attempted another Venus probe launch on 17 June 1967. The vehicle was launched from Tyuratam at 0237Z into a parking orbit of about 52-degree inclination. Although the vehicle was successfully injected into the parking orbit, ejection of the payload into interplanetary trajectory from parking orbit failed. The fourth stage which is used for payload ejection did, however, apparently ignite, adding some velocity increment to the payload, for the probe's altitude after the ejection attempt was slightly higher than that of its parking orbit. Also, US over-the-horizon radars apparently detected limited fourth-stage burn.

The Soviets announced the launch but concealed its true nature by naming the vehicle Cosmos 167 and claiming that it was performing the usual Cosmos mission, that of studying the near-Earth space environment.

Cosmos 167 is the Soviets 12th known Venus-probe attempt. Of the ten launched before 1967, six suffered the fate of Cosmos 167 -- they reached parking orbit but failed to eject into interplanetary trajectory. The Soviets announced that communications on the other four failed. Thus, none of the ten returned to Earth any useful information about Venus. The Soviets have launched six Mars probes with the same general result.

The Soviets may try to launch another Venus probe before the current Venus launch window closes, around the end of June. Such an attempt appears likely in view both of the failure of Cosmos 167 and of the fact that the Soviets have on some previous occasions launched probes in series of three.

In contrast with the recent Venus-probe launches, the Soviets did not launch any probes to Mars when the window for such launches opened recently (mid-December through mid-February). This was the first time since the Soviets' interplanetary launches started in 1960 that the USSR has failed to take advantage of a Venus or Mars launch-window opening. The Soviets may have skipped this Mars window to concentrate their resources on the current Venus window, particularly since the failure rate has been high. Earth-Mars geometry will be more favorable for Mars probes in 1969, when the Mars launch window next opens.

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Studies of Working Metals in Magnetic Fields May Lead to Space-Vehicle Shielding

Increasing Soviet efforts to synthesize various metallurgical techniques have recently culminated in the development of a process which combines



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simultaneous heat treatment and mechanical working in the presence of a magnetic field.

Magnetic treatment of different materials may greatly enhance their magnetic, mechanical, and other physical properties. Annealing a certain transformer steel with simultaneous application of tension in the presence of a magnetic field, for instance, intensifies the magnetic texturing of the steel and assures a sharper improvement of pertinent characteristics than does separate application of these processes or forces, according to Soviet studies.

In particular, very strong magnetic fields (on the order of 10^8 oersteds) created with the use of such magnetically treated materials, may provide a shield for space vehicles against gamma rays.

(FTD)

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Venus 4 Will Require Inflight Course Correction, Trajectory Analyses Show

An estimated trajectory of Venus 4, the Soviets' newest probe of the planet Venus, tentatively indicates that the spacecraft will make its closest approach to Venus on or about 26 October 1967 (about 136-days) at a distance of about 98,000 n.m., unless a course correction is made. This trajectory, based on RADINT analysis, is consistent with the probe's position at 1100Z, 12 June, as announced by TASS.

For a close flyby of the planet or impact on it, the probe's velocity would have to be changed by about 225 feet per second, a correction within the estimated capability of the probe's inflight course-correction engine.

Venus 4 is 315-322 pounds heavier than Venus 2 or Venus 3, which were launched, respectively, on 12 and 16 November 1965, according to Soviet announcements; the new probe weighs 1,106 kilograms (2,438 pounds), vs. 963 kg (2,123 pounds) for Venus 2 and 960 kg (2,116 pounds) for Venus 3. Two possible explanations for the increased weight:

- Venus 4 may be basically similar to either Venus 2 or Venus 3 but with equipment added to improve the reliability of communications; the Soviets have said that the last two probes could not complete their missions because of communications failure in the vicinity of Venus.
- The Soviets may be using a heavier modification of the previous Venus probes. A modified spacecraft could accommodate a larger payload (additional instrumentation and auxiliary equipment) for more detailed scientific investigations.

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