NORTH AMERICAN AIR DEFENSE COMMAND

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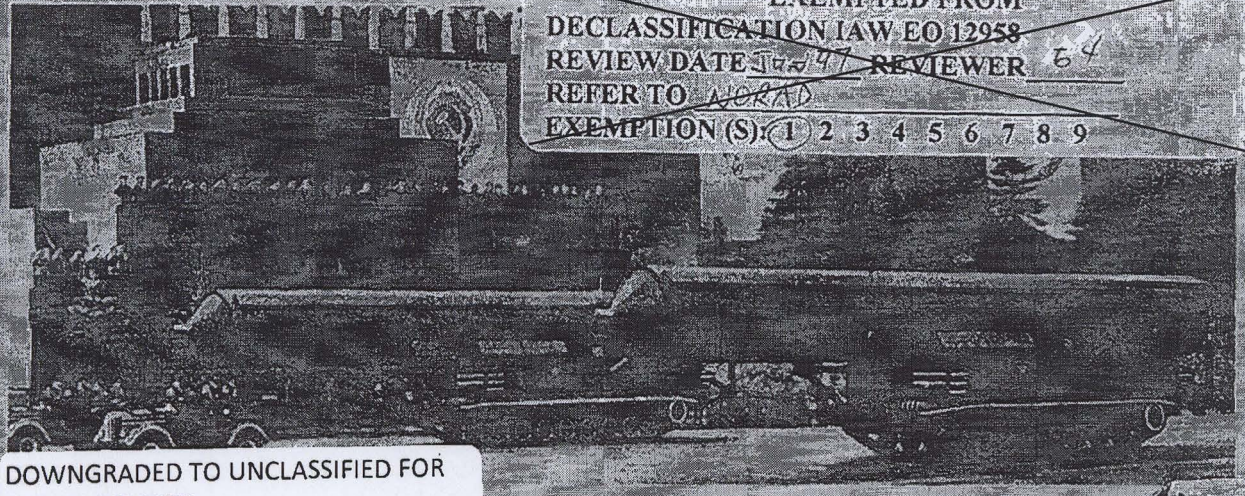
WEEKLY INTELLIGENCE REVIEW (U)



WIR 47/65
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The WIR in Brief

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Space

COVER: Mobile missile pods, Moscow, 7 Nov 1965. (OFFICIAL USE ONLY)

NOTE: Pages 28, 29, 32, 33, 36, 37, 40 and 41 of this issue are blank.

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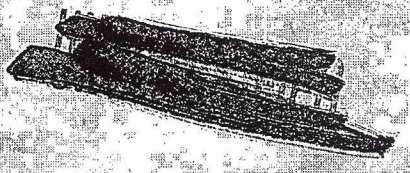

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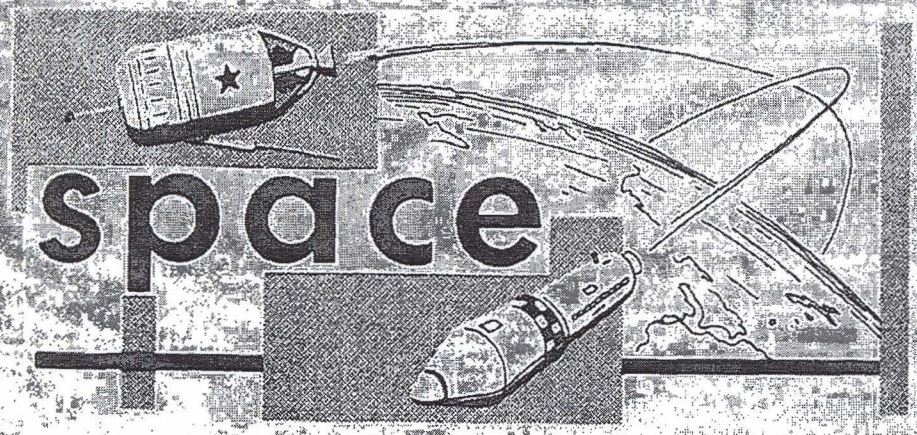

significant intelligence on space developments and trends

China Increasingly a Target of Soviet Photoreconnaissance Satellites

50X1 and 3, E.O.13526

Soviet photoreconnaissance satellites of the Cosmos series launched from Tyuratam have been undertaking extensive photographic coverage of Communist China, while continuing their program of photographing Western military installations and weapon-development facilities.

The program may have begun with Cosmos 35, which was launched into a 51-degree orbit on 15 July and de-orbited 8 days later on Revolution 128. [redacted] indicates that the payload was active when the satellite was 60 miles southeast of China's nuclear test site at Lop Nor and again when the satellite was flying north of and parallel to the ChiCom-North Korean border (map on p. 32, WIR 6/65).

Cosmos 48, which was launched 14 October 1964, apparently tried to photograph the Lop Nor test area on its first pass after the test, which was conducted on 16 October 1964. The Soviets de-orbited Cosmos 48 at the next favorable opportunity, 6 days after launch, rather than letting the satellite complete the 8-day mission which has been standard for almost all the Soviets' operational photorecce satellites. Cosmos 48 also photographed Manchuria and part of eastern China.

The first extensive coverage of China was undertaken by Cosmos 50, which was launched on 28 October 1964. Pictures were taken on several passes over the Peiping area, the Manchurian industrial complexes, and central China, as well as the Lop Nor area. None of the photography was recovered, however, since Cosmos 50 exploded during the de-orbit attempt.

The next photorecce satellite, Cosmos 52, which was launched January 1965, also was programed for extensive coverage of China, photographing the Lop Nor area as well as military and industrial targets in central China and the Peiping area. (Map on page 39.)

No Soviet coverage has yet been detected of some major ChiCom facilities, such as the Shuang-cheng-tzu missile test center or the Lanchou gaseous diffusion plant. However, the extent of coverage of China since de-orbit of Cosmos 52 has not been determined yet. Preliminary analysis of telemetry from Cosmos 68 (launched 15 June 1965, de-orbited 23 June 1965) indicates fairly heavy coverage of China, and it is likely that many other Soviet photorecce satellites have also photographed areas of that nation.

The Soviets' photorecce effort still appears to be focused on the US, but there is heavy coverage of other Free World military bases and advanced-weapon facilities as well. Use of a camera system of high resolution (5-8 feet) appears to have increased sharply this year: First tested in late 1963, the system has been carried by 10 of the first 15 photorecce satellites launched in 1965, compared with only 3 of the 12 launched in 1964.
(CIA; NORAD)
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Recent Intercepts of Soviet Space-Vehicle Transmissions

Following is a listing of recently reported intercepts of transmissions from Soviet space vehicles which are still in orbit and may still be active:

Vehicle	Date of Launch	Signal Characteristics	Date of Most Recent Intercept
1st Molniya 1	23 April 65		
Cosmos 71	16 Jul 65		
Cosmos 72	16 Jul 65		
Cosmos 73	16 Jul 65		
Cosmos 75	16 Jul 65		
Cosmos 76	23 Jul 65		
Cosmos 93	19 Oct 65		

50X1 and 3, E.O.13526

Vehicle	Date of Launch	Signal Characteristics	Date of Most Recent Intercept
Proton 2	02 Nov 65	50X1 and 3, E.O.13526	
Cosmos 95	04 Nov 65		

50X1 and 3, E.O.13526

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2 Venus Probes Launched; One Takes Long Route to Target

The Soviets launched two Venus probes within 4 days from the Tyuratam missile test range:

- Venus 2 was launched at about 0447Z, 12 November.
- Venus 3 was launched at about 0413Z, 16 November.

Both probes were launched by the SS-6 booster-sustainer, injected into parking orbits by heavy Venik upper stages, and then re-injected into transfer trajectories toward Venus by their 4th interplanetary stages. For the first time, the parking orbits had Equatorial inclinations of 51 degrees; all other Soviet parking orbits have had inclinations of about 65 degrees.

Dates of Arrival and Distances from Earth. Venus 2 will probably reach Venus late in February, as announced by the Soviets. Venus 3, however, appears to have been launched on a long trajectory which will delay its arrival and double the distance over which it must transmit any data which may be collected about Venus. It could have been injected into

a trajectory that would have brought it to the vicinity of Venus about 105 days after launch, in late February or early March. It is believed, however, that Venus will reach its target about 19 April, plus or minus 10 days, depending upon the magnitude and direction of midcourse guidance correction(s) that may be executed.

The Soviet choice of a route which doubles the communications distances would appear to be surprising, when it is recalled that all previous Soviet planetary probes which have been launched successfully had experienced failure of communications long before reaching their targets. The Soviets have not yet communicated successfully at even one half the distance which signals from Venus 3 must travel to the Earth. Moscow apparently believes, however, that it has solved its deep-space communications problems.

The advantage of the longer route is that payloads can be heavier, because the velocity requirements are lower.

Payloads and Missions. The Soviets have not described the payloads of Venus 2 and Venus 3 in detail, but they have announced that the payloads weigh about 960 kilograms (about 2123 pounds) and that Venus 3's payload is different from that of Venus 2, by including some "new" scientific tasks.

The 2 new probes thus are heavier than Mars 1 (launched 1 November 1962) by about 66.5 kilograms and may, therefore, contain as much, if not more, instrumentation. Mars 1, according to the Soviet press, carried the following instrumentation in 2 separate compartments:

- A photo-TV device for photographing the surface of Mars.
- A spectro-reflectometer for detecting organic ground cover.
- A spectrograph for studying the ozone absorption bands in the Martian atmosphere.
- Magnetometers for detecting the magnetic field of Mars and for measuring magnetic fields en route.
- Gas-discharge and scintillation counters for detecting the radiation belts of Mars and for studying the cosmic radiation spectrum.
- Counters for sampling the atomic components of primary cosmic rays.
- A radiotelescope for study of space radiation in the 150- and 1500-meter bands.
- Traps for registering streams of low-energy protons and electrons and also the concentration of positive ions near Mars and in space.
- Sensors for registering collisions with micrometeorites.

The two new Venus probes may carry somewhat similar instrumentation unless, of course, greater redundancy has been built into their communications systems in the interests of greater reliability.

It is highly likely that one or both of the new probes includes a photo-TV system such as Zond 3 used to photograph the unseen side of the Moon on 20 July 1965 (pp 13-15, WIR 35/65 and pp 8-11, WIR 36/65). The video frames of that system reportedly consisted of 1100 lines, with 860 elements per line. Such a system probably would not be able to photograph the surface of Venus but could produce pictures of the dense cloud cover which engulfs that planet. This cloud cover is extremely bright, but the Soviets will probably photograph it through a variety of filters, to obtain the most desirable degree of contrast.

(Zond 3 is believed to have tested the systems intended for use in Venus 2 and Venus 3. Launched 18 July 1965, it passed near the Moon on 20 July, after which it went into a highly elliptical solar (planetary) orbit. On 27 October it was some 33,400,000 kilometers (about 18 million n.m.) from the Earth and was still functioning satisfactorily, according to a recent TASS report. A total of 99 communications sessions reportedly had been held by 27 October, some of which involved retransmission of video of the photography taken when the probe passed by the Moon.)

Position Reports. TASS on 16 November reported the following positions of the new probes:

- At 1800 hours Moscow time (1600Z), 16 November, Venus 2 was 1,149,000 kilometers (548,000 n.m.) from the Earth.
- At 1200 hours Moscow time (1000Z), 16 November, Venus 3 was 65,000 kilometers (35,000 n.m.) from the Earth, over geographical coordinates 23S5N-9939E.

Significance. Venus 2 and Venus 3 are, respectively, the Soviets' 14th and 15th known interplanetary probe attempts. Nine have been propulsion failures, 4 communications failures. If either or both of the new vehicles succeed in accomplishing their missions, or major parts thereof, they will probably record more information about Venus than did the US's Mariner 2, which passed within 25,000 miles of Venus in 1963 and transmitted data on the planet's temperature and magnetic field.

The Soviet decision to openly admit that the vehicles are Venus probes is a reversal of the subterfuge resorted to in 1964 of calling such vehicles Zonds (probes) and stating that they were intended merely to explore interplanetary space. Soviet scientists appear to have convinced

Soviet propagandists that the subterfuge was useless, if not counter-productive, since the West could easily identify them as Venus or Mars probes by the time of launch alone.

The announcement that Venus 2 and Venus 3 have dissimilar payloads may, however, be a new type of subterfuge. While varying the payload composition would appear to be a logical step, the poor reliability showing of past Soviet probes would dictate that sensors for the most important experiments be carried by both vehicles. If the two payloads are identical, the Soviets may have announced that they are not identical with a view to concealing partial payload failures. For example, if both probes carry video photo-TV systems but only one returns any video signals, then the Soviets have a ready-made story that only one vehicle carried a video system

(SPADATS; TASS; NORAD)

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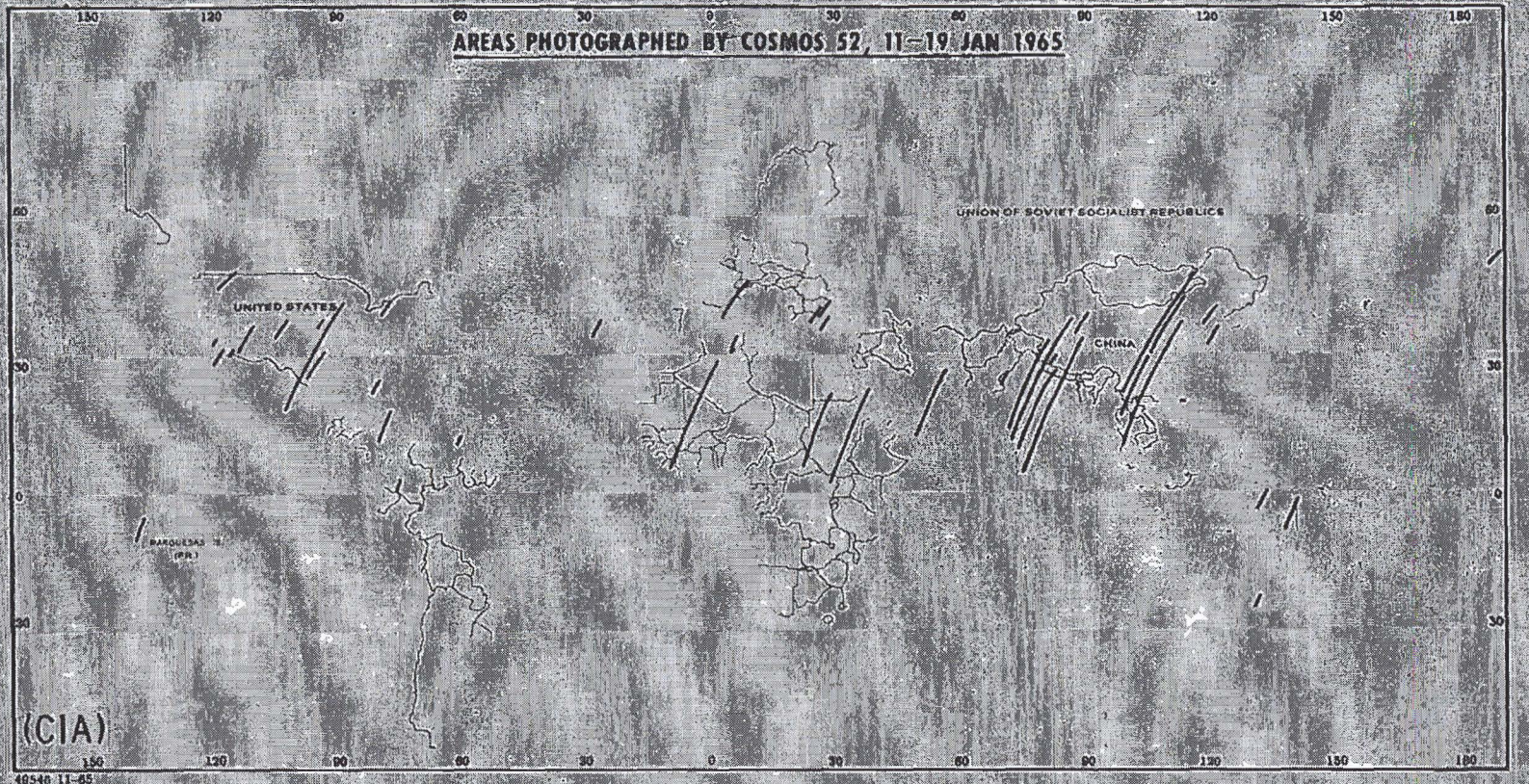

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