

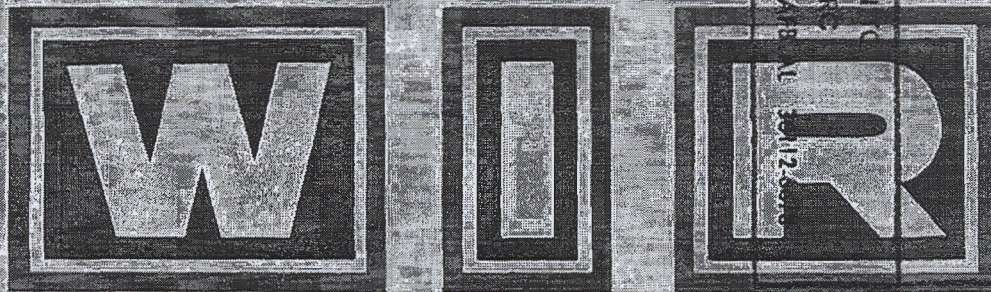
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NORTH AMERICAN AIR DEFENSE COMMAND

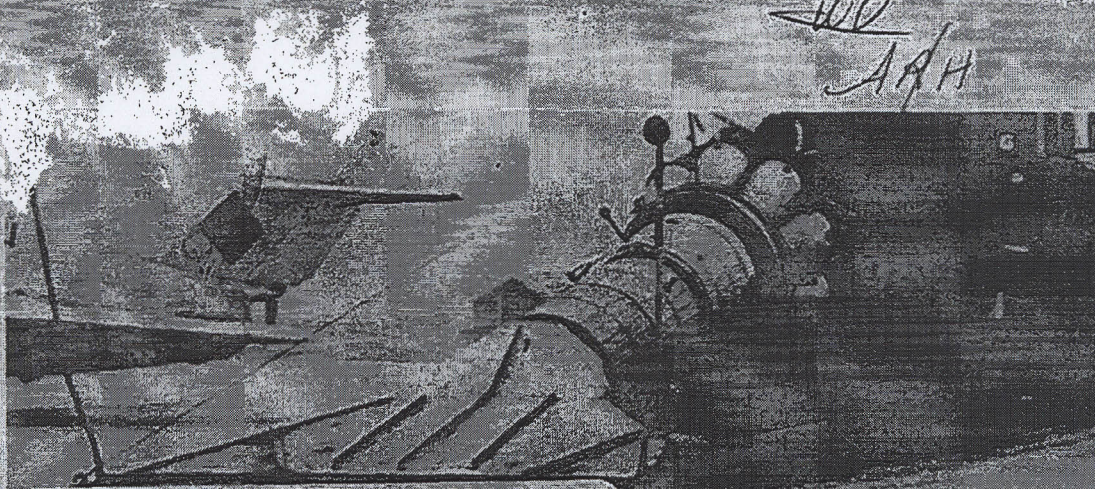


WEEKLY INTELLIGENCE REVIEW (U)

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Issue No. 9165, 26 February 1965

The WIR in Brief

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Space

VOSKHOD INSULATION IDENTIFIED AS POLY-
ESTER-POLYURETHANE FOAM

Probably installed in removable panels, for
easy access to components.

COSMOSES 54, 55, 56 MAY BE COMMUNI-
CATIONS SATELLITES FOR MANNED FLIGHTS

Or may be test beds for such satellites.

COSMOS 57 DISINTEGRATES; MISHAP MAY
SLOW DOWN SOVIET MANNED SPACE PROGRAM

Probably intended to be precursor of another
manned flight.

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COVER: Truck-mounted jet engine, East German
Air Force, used to melt ice on runways
and taxiways. (UNCLASSIFIED)

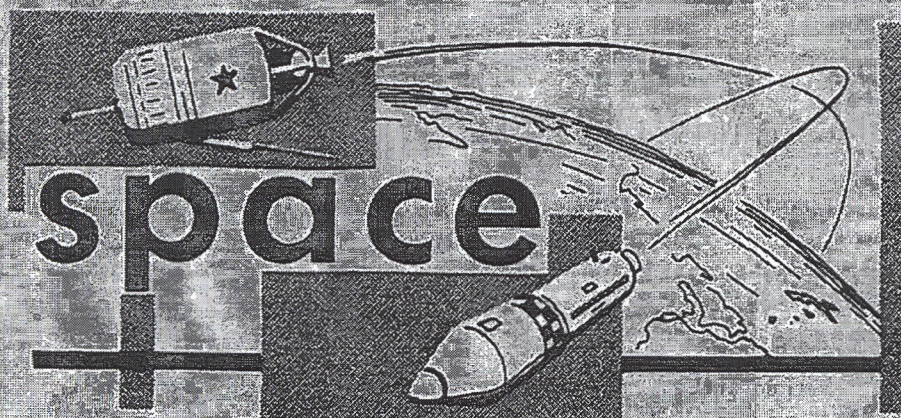
NOTE: Pages 24, 26, 27, 30, 31, 34, 35, 38, 39, and
40 of this issue are blank.

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significant
intelligence
on space
developments
and trends

Voskhod Insulation Identified as Polyester-Polyurethane Foam

The insulation used inside the 3-man Voskhod space vehicle which orbited the Earth for 24 hours 12-13 October 1964 has been referred to in Soviet publications as snow-white "porolon." Porolon is the Soviet trade name for a polyester-polyurethane foam, a material commonly used in both the West and USSR for special thermal insulation problems. It can be easily produced in any desired shape and with varying degrees of flexibility. An identical or similar material was used to cover open wall spaces in the cabins of the earlier Vostoks, the one-man space vehicles.

Porolon should be satisfactory as thermal insulation, that is, it would insure the maintenance of cabin temperature for a reasonably lengthy period in case of an emergency involving the thermal control system. This insulation could also:

- Protect the cosmonauts against possible injury while conducting free-floating experiments.
- Attenuate noise.
- Damp vibrations.
- Possibly absorb contaminants in the cabin atmosphere.
- Afford some limited protection against radiation.

The porolon is believed to be installed in removable panels, permitting inflight access to covered parts and components.

An efficient thermal insulator, such as porolon, could reduce payload weight by reducing the power needed for thermal control.

(DIA)

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Cosmoses 54, 55, and 56 May Be Communications Satellites for Manned Flights

The Soviets launched 3 space vehicles -- Cosmoses 54, 55, and 56 -- with a single rocket carrier from Tyuratam at about 1100Z, 21 February. This event was similar in many respects to the 18 August 1964 launch of Cosmoses 38, 39, and 40. In both cases:

- Three satellites were launched by a single rocket carrier from Tyuratam.
- Essentially the same orbital inclination -- about 56 degrees -- was used, in contrast with the 65-degree inclination used with most Tyuratam-launched satellites.
- Transmitting frequencies of beacons aboard the satellites were similar.

The 3 newer vehicles, however, were launched into higher orbits of longer period. A comparison follows:

	<u>Cosmoses 54, 55, 56</u>	<u>Cosmoses 38, 39, 40</u>
Inclination	56.03-56.06 degrees	56.10-56.14 degrees
Period	104.52-106.22 minutes	94.05-95.24 minutes
Apogee	1,693.5-1,838.7 km (910-985 n. m.)	745-855 km (400-460 n. m.)
Perigee	254.9-268.5 km (137-144 n. m.)	203-209 km (110-113 n. m.)

Though Cosmoses 54, 55, and 56 are in essentially similar orbits, the distance between them is gradually growing. The spread between the payloads enhances their potential use as communications relay satellites. If equipped for this purpose, they could support Soviet manned space events by relaying cosmonaut voice communications to the USSR, using VHF communications. VHF would be preferable to the presently used HF voice communications, which are susceptible to fading over long distances and vulnerable to interruptions caused by sun spots. In the absence of further evidence, however, this trio may consist of test vehicles rather than operational communications satellites.

TASS, in announcing the launch, gave the 3 satellites their Cosmos titles and said that they are performing the usual Cosmos mission of exploring near-Earth space. It said that they are carrying scientific instruments and radios transmitting [redacted]. Intercepts of the first two frequencies have been made, as well as of the following telemetry: [redacted]

50X1 and 3, E.O.13526 [redacted]



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50X1 and 3, E.O.13526

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50X1 and 3, E.O.13526

(SPADATS; various ELINT sensors; NORAD)

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Cosmos 57 Disintegrates; Mishap May Slow Down Soviet Manned Space Program

The Soviets launched Cosmos 57 from Tyuratam at about 0713Z, 22 February 1965, apparently using the familiar SS-6 ICBM booster/sustainer for launch and injecting the payload into orbit with the heavy Venik third stage. The vehicle's orbital parameters have been given as follows:

	<u>By SPADATS</u>	<u>By TASS</u>
Inclination	64.7 degrees	64.8 degrees
Period	90.3 minutes	91.1 minutes
Apogee	426.7 kilometers (229 n. m.)	512 kilometers (276 n. m.)
Perigee	164.6 kilometers (87 n. m.)	175 kilometers (94 n. m.)

ELINT has been received on frequencies of [REDACTED]

[REDACTED] Received signals included mechanically simulated biotelemetry.

Disintegration. Some time between the early part of Orbit 1 and the early part of Orbit 2 -- 0912Z-1020Z -- Cosmos 57 appears to have disintegrated. US radars had tracked the vehicle during the early part of Orbit 1 but did not detect it early in Orbit 2. Instead, 40-100 pieces, apparently fragments, were picked up, along with the still-orbiting rocket body. Some ELINT was reported from 1000Z to 1050Z by two stations, an indication that the payload, or part of it, continued to transmit after disintegration, a phenomenon also observed with respect to Cosmos 50. Most of the pieces are expected to decay between 24 February and 18 March.

Cosmos 57 is the second presumably recoverable Soviet spaceship to explode or disintegrate in recent months. Cosmos 50 exploded during an attempt to de-orbit it after 8 days in flight. It is unlikely that the Soviets were trying to deorbit 57 when it disintegrated -- 2-3 hours after launch. Breakup may have resulted, rather, from an attempt to change the satellite's attitude or its orbital parameters.

Mission. The Soviets announced four hours after launch that Cosmos 57 was performing the usual Cosmos mission of near-Earth space research. They announced that it was transmitting telemetry and that all systems were



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functioning normally -- an hour or two after the vehicle had disintegrated.

Cosmos 57, NORAD believes, was a precursor of a planned manned space event of some kind, playing for it the same role that Cosmos 47 played for the Voskhod multimanned launch which followed 6 days later (p. 13, WIR 42/64). Cosmoes 47 and 57 used the same launch-vehicle configurations

[redacted] which has been used to date only on the manned Vostoks and Voskhod and on test vehicles which preceded them into orbit. The only known essential difference between Cosmoes 47 and 57 is that the latter's orbital period was slightly longer, which would permit it to remain in space for a longer period of time. Cosmos 57 thus may have been planned to be the precursor of a Voskhod mission of extended duration -- possibly up to a week. Although there is no evidence to this effect, it is also possible that this vehicle might have had some degree of in-orbit maneuvering capability and that the execution of one or more maneuvers may have been the main purpose of the test.

If this is the case, then the Soviets may be up to their old trick of taking the wind out of the sails of US space events which have been publicly scheduled long in advance. This they do by staging a similar but superior mission in advance of the US event. Thus, Yuri Gagarin orbited the Earth in April 1961, several weeks before the suborbital flight of Commander Shepard. The Soviets' 3-man Voskhod orbited the Earth 16 times in October, two months before the December-scheduled (later canceled) 3-orbit flight of a 2-man Gemini. And now, as the US prepares for four possible Gemini flights in 1965, the Soviets may be trying to overshadow any 1965 Gemini flights which might outshine the flight of Voskhod 1 in any manner.

The Gemini program for 1965 has been reported in the press to be tentatively as follows:

- A 3-orbit flight in late March or April.
- A 4-day flight in June or July.
- A 2-day flight, possibly in October, involving experiments in which one astronaut opens a hatch, leans out, and opens another hatch for retrieving equipment.
- A 7-day flight in late 1965 which might involve a rendezvous and docking maneuver of a rudimentary type.

Prospects. The Soviets have already overshadowed the first planned Gemini flight, which still has not taken place. However, the Cosmos 57 mishap may delay the Soviet man-in-space program. The Soviets have not been reckless with the lives of their cosmonauts in the past. It is unlikely that they will attempt the manned version of a space event which has failed in an unmanned rehearsal until one or more unmanned vehicles have executed successfully the Cosmos 57 mission.

(SPADATS; various ELINT sensors; press; NORAD)

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