

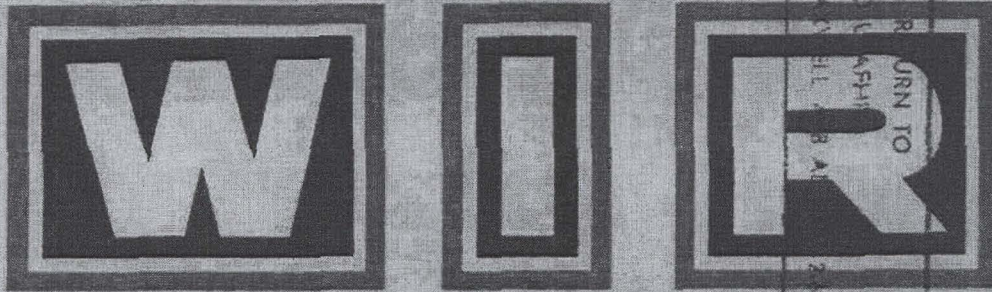
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DECLASSIFICATION DATE: February 25, 2015

NORTH AMERICAN AIR DEFENSE COMMAND



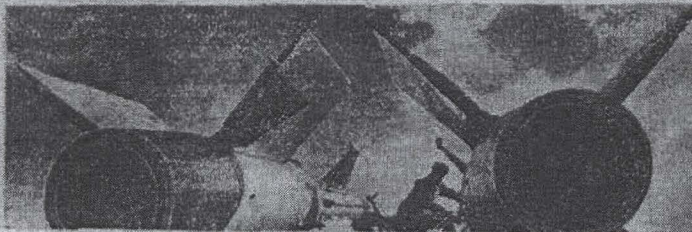
WEEKLY INTELLIGENCE REVIEW (U)

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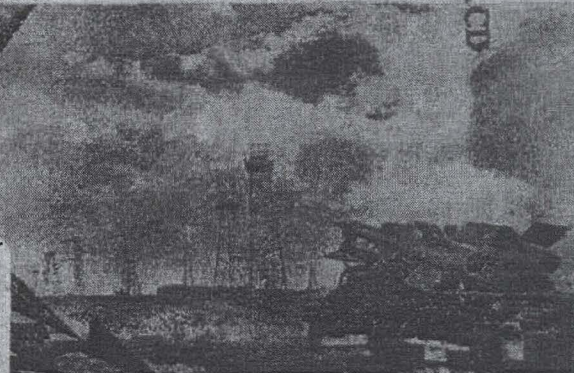
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WIR 18/66
6 May 66

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NORAD

Weekly
Intelligence
Review

Issue No. 18/66, 6 May 1966

RETRN TO
HQ US-THRC
AL 36112-6

K410.607-271

The WIR in Brief

Portion identified as non-responsive to the appeal

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Space

SWEDEN BUILDS MANNED CENTRIFUGE FOR SOVIETS, PROBABLY FOR MAN-IN-SPACE PROGRAM

One of only 2 in world having horizontal rotating fork system.

PHOTORECCE COSMOS 115 DE-ORBITED ROUTINELY

Spent nearly 8 days in orbit.

COSMOS 110 DOG EXPERIMENT LESS THAN A COMPLETE SUCCESS

Some telemetry defective.

SPACE STATUS REPORT

As of 1000Z, 3 May.

VOSTOK HEAT SHIELD ADEQUATE FOR RE-ENTRY AFTER CIRCUMLUNAR FLIGHT

Appraisal based on analysis of piece of heat shield of Cosmos 50, believed to be same as Vostok's.

RECENT INTERCEPTS OF SOVIET SPACEVEHICLE TRANSMISSIONS

COVER: COA low-altitude air-defense missiles (from Red Star) (OFFICIAL USE ONLY)

NOTE: Pages 30, 31, 32, 34, 35, 38, 39, 42, 43, 46, 47 and 48 of this issue are blank.

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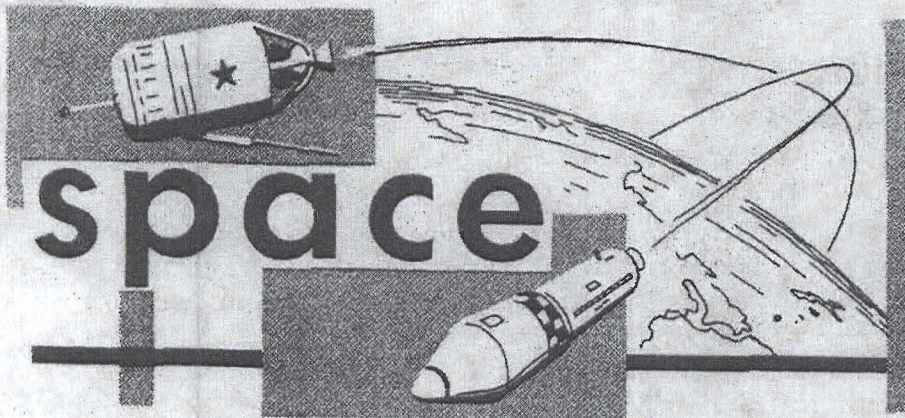
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significant
intelligence
on space
developments
and trends

Sweden Builds Manned Centrifuge for Soviets, Probably for Man-in-Space Program

Swedish engineers who recently visited a USAF research facility said that they were building a human centrifuge for the Soviets, the installation to be completed by the summer of 1967. An image-intensifier X-ray system licensed from West Germany and French-designed medical electronics equipment for study of subjects also are to be included. The new centrifuge will be one of two existing ones which incorporate the horizontal rotating fork system. This system permits rotation of a subject in three planes while in a multipositioned seat in a gondola.

This device will probably be used for research of manned space flight and for the training of Soviet cosmonauts.

(CIA)

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Photorecce Cosmos 115 De-Orbited Routinely

Cosmos 115, a photoreconnaissance satellite which the Soviets launched from Tyuratam at about 1039Z, 20 April 1966, was de-orbited 28 April 1966 after nearly 8 days in orbit, impacting in the USSR at about 0906-1911Z. De-orbit apparently came during the early part of Revolution 128. Shemya last detected the payload on Revolution 127, although it should have picked it up on Revolution 128 if the vehicle had not been de-orbited. Preliminary data from Diyarbakir also indicates de-orbit early on Rev 128.

A chart showing the times spent in orbit by Soviet photoreconnaissance vehicles is shown on page 45. These satellites could also perform other missions, since the camera load does not require the whole weight and volume capacity of the re-entry vehicle.

(NORAD)

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Cosmos 110 Dog Experiment Less Than a Complete Success

50X1 and 3, E.O.13526

Preliminary analysis of VHF and [redacted] from the dogs aboard Cosmos 110 (p. 8, WIR 10/66) indicates defective transmissions. Although there may have been some onboard recording and storage of data to compensate for some of the defects in telemetry, this ambitious neurocirculatory experiment will not yield as much information as the Soviet scientists had hoped for.

The two dogs were instrumented to show 3 aspects of heart action by way of an electrocardiogram, a seismogram, and the arterial pulse. Also, the experimental dog (the one subjected to nonstandard conditions, such as medication) was equipped with a pneumogram (to measure breathing rate) and an intra-arterial device to record mean arterial blood pressure. Apparently this was the only animal monitored in the long-range [redacted]

[redacted] The signals suggested that drugs were being injected into this animal, and there were ground commands which apparently elicited a response from both dogs.

Defects in the telemetry included:

- The seismogram was of poor quality.
- The intra-arterial blood pressure signal became fixed sometime between orbits 4 and 12, as if blood clotting had occluded the sensor.
- There was evidence of erroneous ground commands.
- Triggering of the [redacted] heart-rate signal was erratic.

(CIA)

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Space Status Report

The over-all space-vehicle status as of 1000Z, 3 May 1966, was as follows:

	USA	UK	Can	Italy	France	USSR	Total
Payloads orbiting Earth	170	2	2		3	42	219
Payloads orbiting Sun	9					9	18
Payloads on Moon	5					5	10
Payloads orbiting Moon						1	1
Payloads on Venus						1	1
Debris orbiting Earth	665	1	2		11	142	821
Debris orbiting Sun	8					5	13
Totals	857	3	4		14	205	1083



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	<u>USA</u>	<u>UK</u>	<u>Can</u>	<u>Italy</u>	<u>France</u>	<u>USSR</u>	<u>Total</u>
Payloads decayed or de-orbited	181			1		111	293
Debris decayed	181					604	785
GRAND TOTALS	1219	3	4	1	14	920	2161

(NORAD Space Defense Center)
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Vostok Heat Shield Adequate for Re-entry after Circumlunar Flight

The heat shield of the Vostok, the craft which the Soviets used for their first 6 manned space flights, is believed to be thick enough to protect the vehicle against the heat which would be encountered during re-entry after a circumlunar flight. This belief is prompted by an analysis of a charred fragment which is apparently part of the heat shield of Cosmos 50, one of a series of Soviet photoreconnaissance spacecraft which is believed to be identical in configuration to the Vostok.

The fragment (photo on page 44) was discovered in Africa in January 1965, about two months after 12 November 1964, when an atmospheric explosion was heard and an object was seen falling to the ground in Malawi (Nyasaland). The only space objects which decayed in the Earth's atmosphere on that date were 24 fragments of Cosmos 50, which exploded on 5 November when the Soviets tried to de-orbit it.

The object was composed of several laminated layers of a burlap-like material which was analyzed by FTD and identified as a phenolic ablator and part of a heat shield of a non-US re-entry vehicle. This ablative material apparently was applied directly to the spherical shell of the cabin rather than to a separate heat shield (the latter is US practice).

The Vostok is believed to use the same type of heat shield, since several factors suggest that the Vostok and the photorecce Cosmoes are identical in basic spacecraft configuration. One of these is identical propulsion telemetry, which would indicate nominally equivalent weight. The fragment adds support to this estimate:

- Its 1.56-inch thickness matches the apparent 1.5-inch thickness of the nonmetallic covering noted on the Vostok publicly displayed by the Soviets.
- The charred recovered fragment was found, on measurement, to be a segment of a sphere having an inner radius of about 45 inches -- the same as that of the Vostok displayed.



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The Vostok heat shield apparently provides much more protection than would be needed for ordinary re-entry from Earth orbit with retro-rocket assistance. Analysis of the material indicates that a heat-shield thickness of 1.17 inches would suffice for this purpose. However, the Soviets apparently intentionally overdesigned the heat shield with an eye to safety -- to enable safe recovery of the manned vehicle should the retro-rockets fail and the spacecraft be required to suffer natural orbital decay. It turns out, however, that the heat shield is also more than adequate for protection against the heat which would be encountered should the Vostok be sent into circumlunar flight and an attempt made to recover it. A heat-shield made of this phenolic ablator would have to be only 1.36 inches thick to protect the Vostok against heat during re-entry after circumlunar flight.

(CIA; FTD)

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Recent Intercepts of Soviet Space-Vehicle Transmissions

Of the 42 Soviet payloads orbiting the Earth, Moon, and Sun as of recent date, only 4 apparently were transmitting:

<u>Vehicle</u>	<u>Date of Launch</u>	<u>Signal Characteristics</u>	<u>Date of Most Recent Intercept</u>
Cosmos 106	25 Jan 66	50X1 and 3, E.O.13526	
Luna 10	31 Mar 66		
3d Molniya 1	25 Apr 66		

Cosmos 116 26 Apr 66

(Various ELINT sensors)

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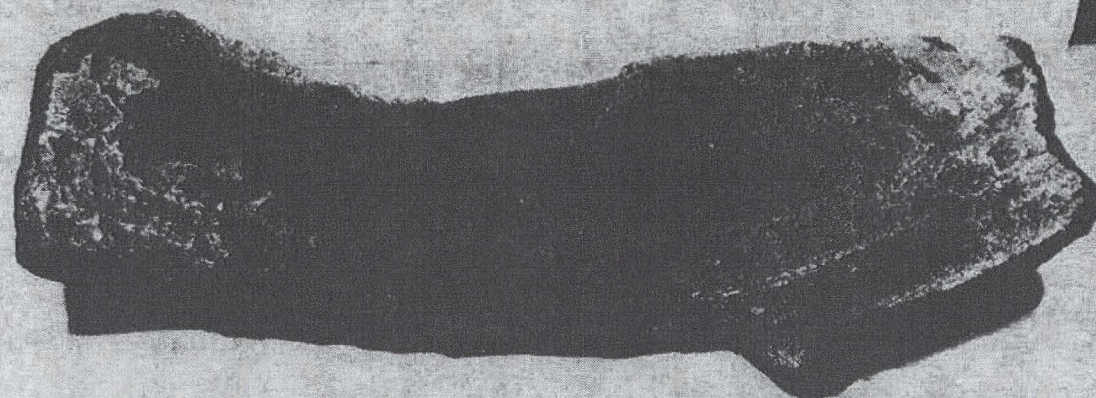
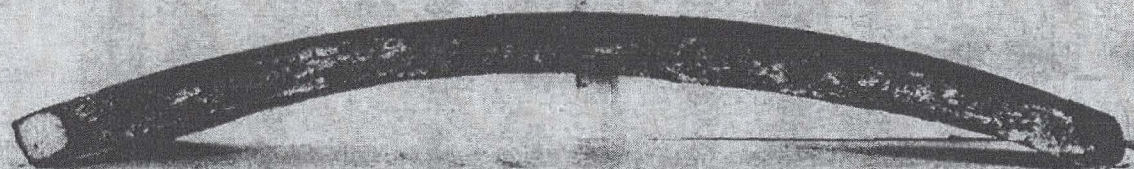


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Cosmos 50 Heat Shield
(Segment Found in Africa)

(CIA)



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NOVAD

6 May 66



2	TIME IN ORBIT (widths)
P	COSMOS NO.
F	(launched from Plesetsk)
.	PROMPSION FAILURE
V	VENIK UPPER-STAGE USED
	(ALL OTHERS USED THE LUNIK)
51	ORBITAL INCLINATION
	(ALL OTHERS WERE 65°)
☛	APPARENT DE-ORBIT FAILURE

Soviets claim all Cosmoses are research vehicles but those shown above are believed to have photorecon missions:

1. Launches were timed so that payloads passed over US, southern Canada, and other targets in daylight when payloads were at perigee.
2. Perigees were relatively low.
3. Payloads were stable with reference to the Earth's surface.
4. Payloads were active when passing over areas of potential photorec interest.

5. In at least one case the vehicle changed attitude before payload activity, following which it returned to original attitude.
6. All vehicles were de-orbited and presumably recovered (allowing film recovery), except for Cosmos 50, which exploded when de-orbit was attempted.
7. Orbits were so low as to be of only limited value for space research.

All were launched by SS-46 ICBM, injected into orbit by upper stage; Lunik-injected payloads weighed 2-

about 10,000 lbs, carried camera system of 20-30' resolution. Venk-injected payloads weighed up to about 12,000 lbs, carried camera system of 5-8' resolution. Camera systems would occupy only a fraction of payload weight and volume, so equipment for other missions could be carried. At least 1 apparently collected ELINT. Some believed to have taken part in development of IR and/or UV systems for detecting missile launches. Most 1964 and 1965 missions lasted 8 days. Note infrequency of launches in early days, before system became operational.