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NORTH AMERICAN AIR DEFENSE COMMAND

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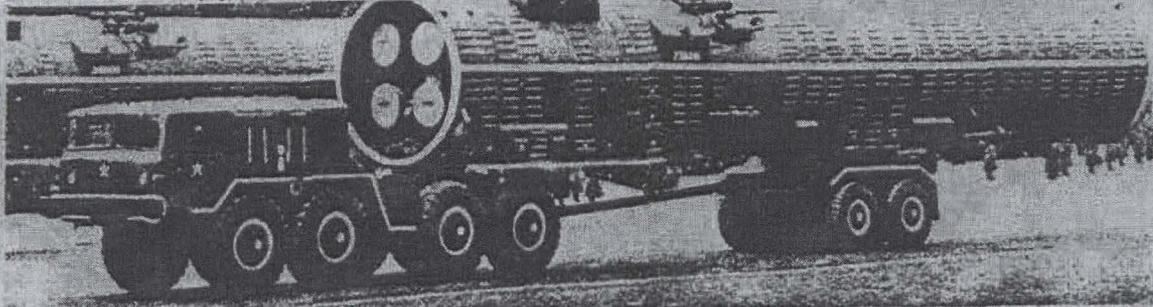
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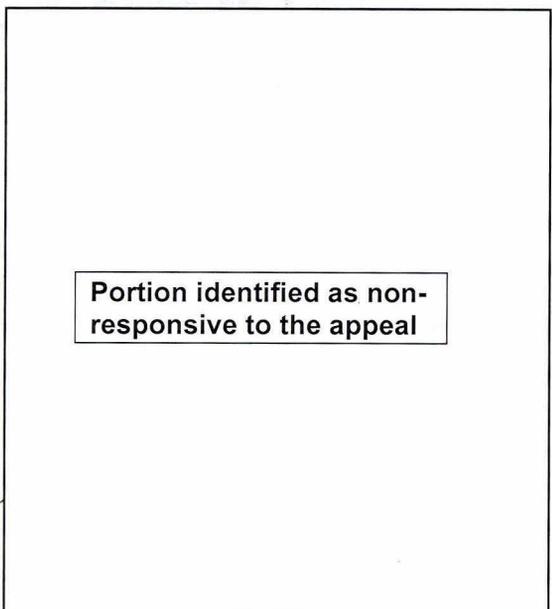
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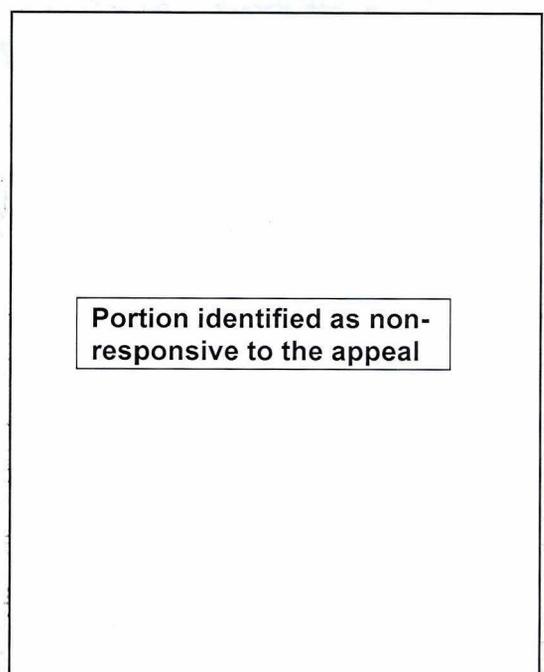
The WIR in Brief

WIR to be Smaller Temporarily

Budgetary restrictions on printing forces the WIR to pare down its size for the rest of the fiscal year, which ends 30 June 1967.

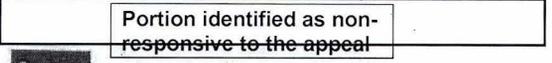


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MISSILE/SPACE LAUNCHES
For 29 Feb-31 Mar.



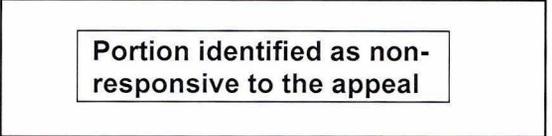
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Space

MAJOR SOVIET EFFORT MOUNTED TO EXPLOIT U.S. SYMPOSIUM ON 'MID'

Soviets have progressed well in past 2-3 years. COSMOS 154 MUCH LIKE COSMOS 146 BUT 3d STAGE NOT RELIGHTED

Another step toward multimanned orbital spacecraft and circumlunar flight.



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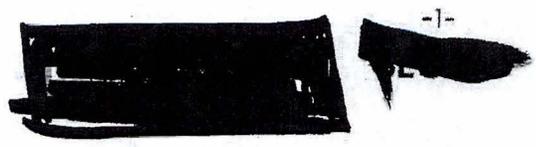
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COVER: GRIFFON ABM (OFFICIAL USE ONLY)
NOTE: Pages 20, 22, and 23 of this issue are blank.

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Missile/Space Launches, 20 Feb-31 Mar 1967

US sensors detected the following Soviet missile or space launches during the period 20 February-31 March 1967:

<u>Date of Launch</u>	<u>Vehicle</u>	<u>Launch Site</u>	<u>Range (n. m.)</u>
21 February	KY-8, MRBM	Kapustin Yar	1050
22 February	SS-4, MRBM	Kapustin Yar	1050
27 February	SL-3, Cosmos 143	Tyuratam	Orbital
28 February	SL-3, Cosmos 144	Plesetsk	Orbital
02 March	SS-11, ICBM	Tyuratam	3400
03 March	SL-7, Cosmos 145	Kapustin Yar	Orbital
04 March	SS-9, ICBM	Tyuratam	3400
10 March	SL-9, plus 3d stage (Cosmos 146)	Tyuratam	Orbital
10 March	KY-8, MRBM	Kapustin Yar	1050
11 March	SS-7, ICBM	Plesetsk	3100
13 March	SL-3, Cosmos 147	Plesetsk	Orbital
14 March	SS-4, MRBM	Kapustin Yar	1050
16 March	SL-8, Cosmos 148	Plesetsk	Orbital
17 March	SS-5, IRBM	Kapustin Yar	2000
18 March	SS-11, ICBM	Tyuratam	3400
20 March	SS-5, IRBM	Kapustin Yar	2000
21 March	Unknown	Perm or Verkhnyaya Salda	2800
21 March	SL-7, Cosmos 149	Kapustin Yar	Orbital
22 March	SL-4, Cosmos 150	Plesetsk	Orbital
22 March	SS-X-6, Unnamed	Tyuratam	Failure
22 March	KY-6 (Solid)	Kapustin Yar	1050
23 March	SS-11, ICBM	Tyuratam	3400
23 March	SS-4, MRBM	Kapustin Yar	1050
24 March	KY-8, MRBM	Kapustin Yar	1050
24 March	SL-8, Cosmos 151	Tyuratam	Orbital





<u>Date of Launch</u>	<u>Vehicle</u>	<u>Launch Site</u>	<u>Range (n. m.)</u>
25 March	SL-7, Cosmos 152	Plesetsk	Orbital
25 March	SS-11, ICBM	Tyuratam	3400 n. m.
27 March	Unknown	Kapustin Yar	Vertical
28 March	SS-4, MRBM	Kapustin Yar	950
28 March	Unknown	Kapustin Yar	Vertical
29 March	Unknown	Kapustin Yar	Vertical
30 March	SS-4, MRBM	Kapustin Yar	1050
31 March	SS-9, ICBM	Tyuratam	3400
31 March	SS-7, ICBM	Plesetsk	3100
31 March	Unknown	Kapustin Yar	Vertical

- SL-3: SS-6 ICBM plus Lunik light upper stage
- SL-4: SS-6 ICBM plus Venik heavy upper stage
- SL-7: SS-4 MRBM plus upper stage
- SL-8: SS-5 ICBM plus restartable upper stage
- SL-9: Proton booster-sustainer

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space

significant
intelligence
on space
developments
and trends

Major Soviet Effort Mounted to Exploit US Symposium on MHD

The USSR, as part of a program to acquire the latest Western technology in MHD (magnetohydrodynamics), mounted a major effort recently to collect information at a symposium on the engineering aspects of MHD which was held at Stanford University 28-30 March.

The 5 official Soviet delegates were from the highest echelons of Soviet science. In addition, 18 or more Soviet scientists, many of them well-known experts in MHD and allied high-temperature R&D, tried to gain entry as tourists under travel arrangements made by the American Express Co. Finally, the official participants solicited visits to at least 10 MHD facilities in the US, many of which are engaged in advanced, classified R&D.

Two of the 5 official participants have been identified with Soviet research in MHD power systems for space vehicles. One of the others directed Soviet MHD R&D concerning large electrical generating stations.

Background. MHD, which includes magnetoplasmdynamics, magnetogasdynamics, and hydromagnetics, is concerned with the interactions which occur when plasmas, gases, or liquids flow through a magnetic field. It is potentially a highly efficient means for generating electricity, both in large power plants and in space vehicles. MHD studies have also spurred progress in the technologies which it employs, such as electromagnetic pumps and control devices for liquid-metal systems.

Estimated Soviet Progress. Some US experts who attended an international MHD symposium in Austria last year opined that the USSR will lead the world in most aspects of MHD R&D in 3-5 years. This assessment is not supported by the available evidence, although the Soviets admittedly have made substantial progress in the past 2-3 years. The USSR is presently believed to be at about the same level as the US in basic MHD research applicable to large-scale generation of electricity and about 18 months behind the US in developing MHD systems for space uses.

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The Soviets, however, appear to be taking an approach to large ground-based power systems which may give them a distinct time advantage over the US. They seem to have chosen to develop an open-cycle system based on combustion of conventional fuels, in contrast with the greater interest of the US in closed-cycle systems which can be used with a nuclear-energy source. The open-cycle system is a technical feasibility today, although a system of this type which operates continuously has not been built yet. The closed-cycle system, however, is far from technological development. Since 1965, the Soviets have spoken of plans to build near Moscow an open-cycle MHD generator designed to operate for long periods in the 10-megawatt range,

MHD scientists from the Kurchatov Atomic Energy Institute in Moscow have claimed that the prime objective of their research is to develop MHD systems for space uses. The Soviet effort, which involves use of liquid metals, is similar in concept to work carried on in the US by Atomics International, Jet Propulsion Laboratory, and MIT; it appears to have advanced to developmental testing of actual components. The Soviets believe that they will be able to prove and carry out this R&D within 2-3 years. However, it is estimated that Soviet liquid-metal MHD systems for space vehicles will not appear until the mid-1970s.

(CIA)

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Cosmos 154 Much Like Cosmos 146, but 3d Stage Not Relighted

Cosmos 154, which the Soviets launched from Tyuratam at about 0901Z, 8 April, appears to be almost a repetition of the Cosmos 146 event (launched 10 March). As such, it is probably the latest in a series of launches (chronological chart on page 21) associated with preparations for launch of a large multimanned spacecraft which will figure in Earth-orbital flights and, possibly, in lunar and other deep-space missions.

Both Cosmos 146 and Cosmos 154 were launched by the Soviets' largest known space launcher (the 2-stage SL-9, which launched the 12.2-metric-ton Protons) and an added restartable upper stage. Both craft were launched into relatively low orbits with Equatorial inclinations of a nominal 52 degrees, the inclination of all Soviet lunar and deep-space probes of the past 18 months. A significant difference, however, is the fact that the upper stage of Cosmos 146 was re-ignited on Revolution 17 and burned for at least 140 seconds, following which [redacted] the payload but picked up 2 new spherical objects (possibly spent propellant containers) in a slightly higher orbit. The 3d stage of Cosmos 154 has not, as of this writing (12 Apr), been relighted; the payload will probably suffer natural orbital decay by 19 April.

Transmissions from Cosmos 146 and 154 have been very similar, except for minor differences [redacted]

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[redacted]



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Similarities of electronic transmissions also suggest a connection between Cosmoses 146 and 154 and Cosmoses 133 and 140 (launched, respectively, 28 Nov 66 and 7 Feb 67). The second pair of spacecraft, however, were launched by the older SL-4 propulsion system (SS-6 booster-sustainer with Venik upper stage) and were de-orbited after 2-day flights. Each also made an in-plane orbital change.

These four launches, plus the SL-9/Proton launches of late 1965-early 1966 (see page 21), are believed to be related to Soviet efforts to launch one or more of any or all of the following types of missions prior to the 7 November celebration of the 50th Anniversary of the Bolshevik Revolution:

- Large multimanned Earth orbiters.
- Lunar probes -- first unmanned, then manned -- which will circumnavigate the Moon and return to Earth.

All the launches associated with this suspected program have taken place from Tyuratam. The apparent quickening of the tempo of this program may explain in part the heightened role of Plesetsk this year as a launch site for the more routine Soviet space launches.

(NORAD)

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