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WIR

WEEKLY INTELLIGENCE REVIEW (U)

K410.607-303

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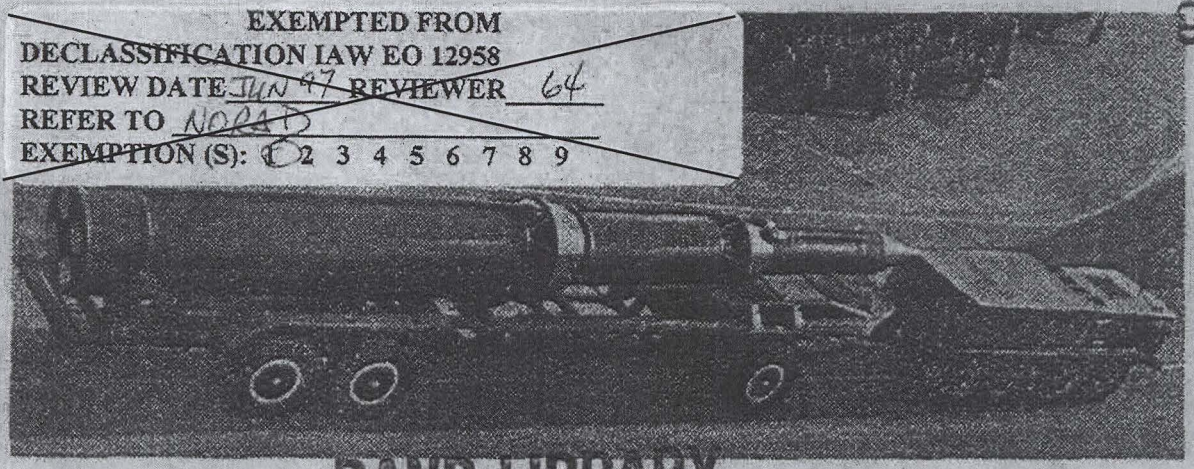

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NORAD Weekly Intelligence Review

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Issue No. 49/66, 9 December 1966

The WIR in Brief

Communist Military Capabilities

SOVIET LIQUID-PROPELLANT ENGINES MAY USE NEW COOLING METHOD 2
Simpler engine design could reduce cost. 2

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Portion identified as non-responsive to the appeal

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Space

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OCTOBER-NOVEMBER SPACE/MISSILE LAUNCHES 11

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15

15

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COVER: 7 November 1966 photo from Red Star showing the SAVAGE solid-propellant ICBM (OFFICIAL USE ONLY)

NOTE: Pages 28, 29, 32, 33, 36, 37, 40, 41, 44, 45, 48 and 49 of this issue are blank.

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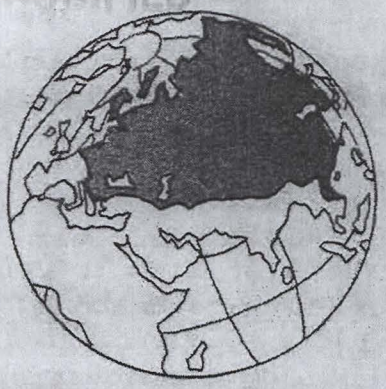
COMMUNIST MILITARY CAPABILITIES



current developments and trends in the armed forces of the Communist World

Soviet Liquid-Propellant Engines May Use Film Cooling, for Simpler Engine Design

The Soviets may have combined film-cooling with regenerative cooling in their liquid-propellant rocket engines in a method which, according to one US rocket expert, should be explored further, since it could reduce the production costs of booster-rocket engines.

In regenerative cooling, which the US uses exclusively in its liquid-propellant engines, the engine is built of numerous tubes with interconnected passageways through which the coolant (the engine fuel or oxidizer) is circulated. A Soviet engineering text published in 1965 shows a diagram of a relatively simple engine design in which regenerative and film cooling are combined. In film cooling some of the fuel or oxidizer in the regenerative coolant passageway is injected directly from the passageway into the combustion chamber, further cooling the engine by evaporation.

The text made no reference to tubular engine walls. The Soviets, therefore, with their propensity for design simplicity and ease of fabrication, may have avoided tubular-wall construction which entails complex manufacturing and brazing technology and very close quality control.

The only previous information available on cooling of Soviet liquid-propellant engines indicated that the early models, designed with German help, were of simple double-wall construction -- concentric cylinders separated by corrugated web.

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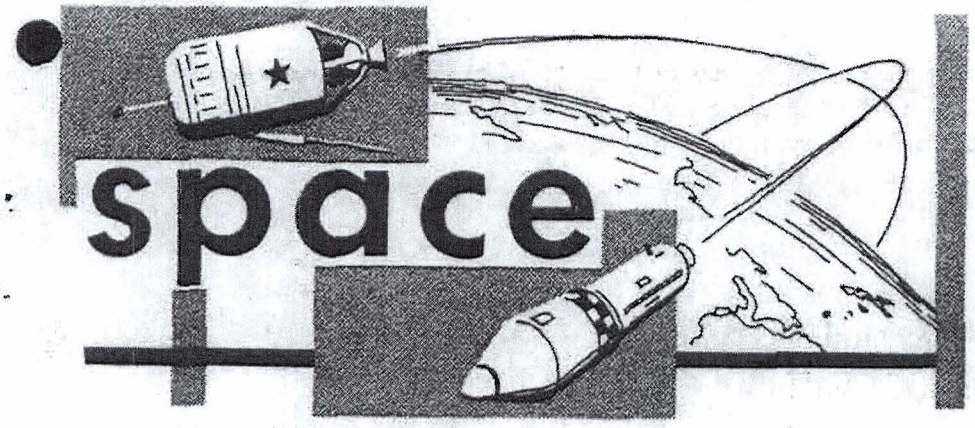

significant intelligence on space developments and trends

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Space/Missile Launches; 7 October thru 30 November 1966

US sensors detected the following Soviet space/missile launches [redacted] during the period 7 October - 30 November 1966:

Approximate Time & Date of Launch	Vehicle	Launch Site	Range (n. m.)
0450Z, 07 Oct	SS-11, ICBM	Tyuratam	3,400
1145Z, 08 Oct	SS-7, ICBM	Plesetsk	3,100
1202Z, 10 Oct	SS-4, MRBM	Kapustin Yar	1,050
0415Z, 13 Oct	Vertical Launch	Kapustin Yar	--
1127Z, 14 Oct	SS-5, IRBM	Kapustin Yar	2,000
1215Z, 14 Oct	Cosmos 129*	Plesetsk	Orbital
1440Z, 19 Oct	SS-11, ICBM	Tyuratam	3,400

Approximate Time & Date of Launch	Vehicle	Launch Site	Range (n. m.)
0547Z, 20 Oct	SS-7, ICBM	Tyuratam	3,400
0636Z, 20 Oct	SS-9, ICBM	Tyuratam	3,400
0751Z, 20 Oct	4th Molniya 1**	Tyuratam	Orbital
0847Z, 20 Oct	Cosmos 130#	Tyuratam	Orbital
0743Z, 21 Oct	SS-11, ICBM	Tyuratam	3,400
1038Z, 21 Oct	SS-5, IRBM	Kapustin Yar	2,000
0425Z, 22 Oct	SS-4, MRBM	Kapustin Yar	1,050
0433Z, 22 Oct	SS-7, ICBM	Tyuratam	3,400
0843Z, 22 Oct	Luna 12**	Tyuratam	Lunar
0228Z, 23 Oct	SS-9, ICBM	Tyuratam	4,500
0600Z, 24 Oct	SS-7, ICBM	Plesetsk	3,100
1329Z, 26 Oct	KY-8 (R&D)	Kapustin Yar	1,050
0541Z, 27 Oct	SS-11, ICBM	Tyuratam	3,400
0442Z, 28 Oct	SS-7, ICBM	Tyuratam	3,400
1600Z, 31 Oct	SS-4, MRBM	Kapustin Yar	1,050
0435Z, 01 Nov	SS-7, ICBM	Tyuratam	3,400
0044Z, 02 Nov	TT-4##	Tyuratam	Orbital
0559Z, 03 Nov	SS-7, ICBM	Plesetsk	3,100
1329Z, 03 Nov	KY-8 (R&D)	Kapustin Yar	1,050
0351Z, 04 Nov	SS-7, ICBM	Tyuratam	3,400
0803Z, 04 Nov	Unidentified	Plesetsk	3,100
0951Z, 12 Nov	Cosmos 131#	Plesetsk	Orbital
0717Z, 16 Nov	SS-5, IRBM	Kapustin Yar	2,000
0511Z, 17 Nov	SS-11, ICBM	Tyuratam	3,400
0635Z, 17 Nov	SS-4, MRBM	Kapustin Yar	1,050
0705Z, 17 Nov	SS-7, ICBM	Tyuratam	3,400
1307Z, 17 Nov	SS-12, MRBM	Kapustin Yar	450
1108Z, 18 Nov	SS-4, MRBM	Kapustin Yar	1,050
0515Z, 19 Nov	SS-11, ICBM	Tyuratam	3,400
0800Z, 19 Nov	Cosmos 132*	Tyuratam	Orbital
0209Z, 21 Nov	SS-9, ICBM	Tyuratam	7,000
0523Z, 22 Nov	SS-11, ICBM	Tyuratam	3,400
0520Z, 23 Nov	SS-4, MRBM	Kapustin Yar	1,050
0315Z, 24 Nov	SS-7, ICBM	Tyuratam	3,400
1324Z, 24 Nov	SS-4, MRBM	Kapustin Yar	1,050
0600Z, 25 Nov	SS-7, ICBM	Plesetsk	3,100
0415Z, 26 Nov	SS-7, ICBM	Tyuratam	3,400
1052Z, 26 Nov	SS-4, MRBM	Kapustin Yar	1,050
1101Z, 28 Nov	Cosmos 133	Tyuratam	Orbital
1335Z, 28 Nov	SS-4, MRBM	Kapustin Yar	1,050
1300Z, 29 Nov	KY-8 (R&D)	Kapustin Yar	1,050

Approximate Time & Date of Launch	Vehicle	Launch Site	Range (n. m.)
1532Z, 29 Nov	SS-7, ICBM	Yurya	3,125
1337Z, 30 Nov	SS-4, MRBM	Kapustin Yar	1,050

*Launched by SS-6 ICBM, injected into Earth orbit by a light Lunik upper stage.
#Launched by SS-6 ICBM, injected into Earth orbit by a heavy Venik upper stage.
**Launched by SS-6 ICBM, injected into Earth orbit by Venik upper stage, re-injected into higher or transfer trajectory by a 4th stage.
##SS-9 ICBM plus a 3d stage.

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