

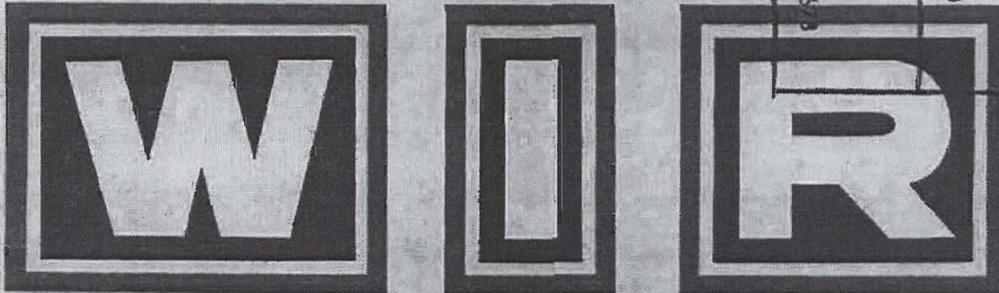
~~SECRET~~

DECLASSIFIED UNDER AUTHORITY OF THE
INTERAGENCY SECURITY CLASSIFICATION APPEALS PANEL,
E.O. 13526, SECTION 5.3(b)(3)

ISCAP APPEAL NO. 2009-068, document no. 237
DECLASSIFICATION DATE: May 14, 2015

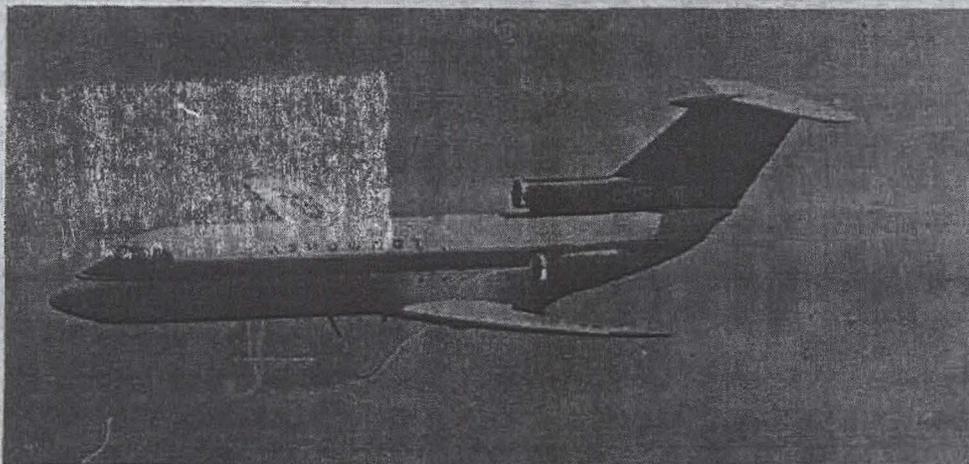


NORTH AMERICAN AIR DEFENSE COMMAND



WEEKLY INTELLIGENCE REVIEW (U)

MICROFILMED BY ADM



FOR OFFICIAL USE ONLY
PRIVILEGED INFORMATION

SEE INSIDE COVER FOR SAFEGUARDING GUIDE

~~SECRET~~

SPECIAL HANDLING REQUIRED
This document is releasable only
to U.S. and Canadian Nationals

~~EXCLUDED FROM AUTOMATIC
REGRADING, DOD DIRECTIVE 5200.10
DOES NOT APPLY~~ Group 1

WTR 5170

30 Jan 70

NITA-P&E 70-455

FEB 16 1970 Postal Registry No. 1285574

~~SECRET~~

RETURN TO

K410.607-370

RECORD LIBRARY

FEB 1 1970

SCANNED BY ACD
2008

00880834

30 Jan 70

5170

NORAD

Issue No. 5770, 30 January 1970

~~SECRET~~

Weekly
Intelligence
Review

RETURN TO
HQ USAF
MAIL ROOM
AFB 1
36112-64

K410.6007-37

The WIR in Brief

Portion identified as non-responsive to the appeal

Portion identified as non-responsive to the appeal

Space

RECSAT COSMOS 318 BROUGHT DOWN AFTER 12-DAY MISSION 187 8

COSMOS 322 A RECSAT 187 8
8-day mission expected.

COSMOS 321 IS 2d PAYLOAD LAUNCHED FROM PLESETSK IN 1970; MISSION NOT KNOWN 187 8
Launched by SL-7.

SOVIET SILENCE ADDS TO MYSTERY OF MOST PAYLOADS LAUNCHED FROM PLESETSK BY SL-7 187 9
Mission details, results never announced.

DESIGNATORS OF SOVIET SPACE PROPULSION SYSTEMS LISTED (U) 12

4 GROUND-BASED COMPUTERS HITCHED IN PARALLEL FOR SPACE-MISSION SUPPORT 187 13
1 large machine would be preferable.

SOVIETS MAY OPERATE OXYGEN-HYDROGEN ROCKET ENGINES AT HIGHER PRESSURES THAN U.S. DOES 187 13

COVER: CODLING/YAK-40 transport. (See page 7.) (OFFICIAL USE ONLY)

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

Portion identified as non-responsive to the appeal



FOR OFFICIAL USE ONLY

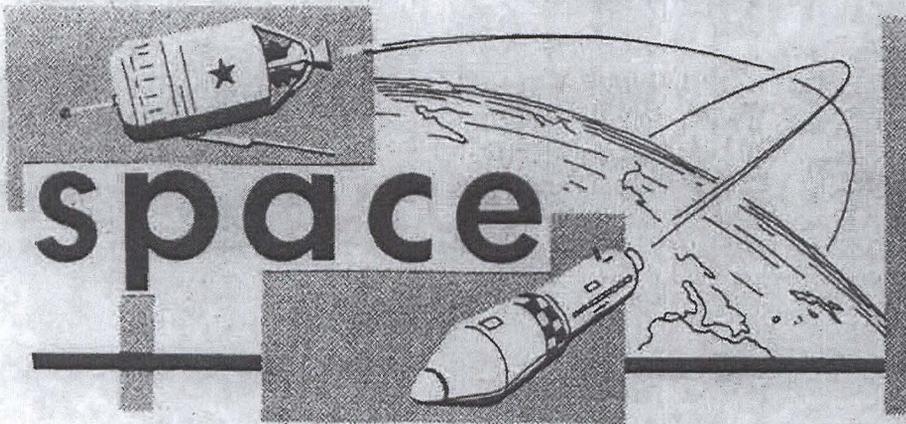
-1-

~~SECRET~~ MICROFILMED BY ADUS

33
23
24
24
25
26
26
27
27
27
28
29
30

00880834

~~SECRET~~



significant
intelligence
on space
developments
and trends

Recsat Cosmos 318 Brought Down After 12-Day Mission ~~(S)~~

Cosmos 318, the military reconnaissance satellite which the Soviets launched from Tyuratam on 9 January, was deorbited early on Revolution 192 after a mission of nearly 12 days. It is estimated to have impacted at about 0702Z in the general area of coordinates 5145N-5550E, or about 30 n.m. east of Orenburg.

This craft carried a low-resolution camera system and ELINT-collection gear, but it may also have carried an infrared-camera system. It was the Soviets' first satellite launch this year.

(NORAD)

~~(SECRET)~~

Cosmos 322 A Recsat ~~(S)~~

Cosmos 322, which the Soviets launched from Plesetsk at about 1200Z, 21 January, is a military reconnaissance satellite which carries a high-resolution camera system. It is expected to perform an 8-day mission. This reccat was launched about 4.5 hours after deorbit of reccat Cosmos 318.

(NORAD)

~~(SECRET)~~

Cosmos 321 is 2d Payload Launched from Plesetsk in 1970; Mission not Known ~~(S)~~

The Soviets launched Cosmos 321 from the Plesetsk Space/Missile Complex by an SL-7 propulsion system at about 2020Z, 20 January. This is the second spacecraft launched from Plesetsk this year by the SL-7. NORAD Space Defense Center reports its orbital parameters as follows:

-8-

WIR 5/70 30 Jan 70

~~SECRET~~



Inclination	71 degrees
Period	92.06 minutes
Apogee	481.80 km (260 n.m.)
Perigee	273.46 km (147 n.m.)

The WIR has been referring to payloads launched from Plesetsk by the SL-7 as environmental research satellites. The fact is that the exact mission of these craft is not known. (See next item.)

(NORAD)

~~(SECRET)~~

Soviet Silence Adds to Mystery of Most Payloads Launched from Plesetsk by SL-7 ~~(S)~~

The mission of most of the small (400-800 pounds) nonrecoverable payloads launched from Plesetsk by the SL-7 propulsion system (plus a few prototypes launched from Kapustin Yar -- KY) is not known to the West. The mission, whatever it is, appears to be classified, judging by Soviet secretiveness about mission results.

The satellites in question have all been launched by the SL-7 propulsion system (with modified upper stage) -- the Soviets' smallest -- into relatively eccentric orbits with periods of about 92 or 102 minutes.

25X1 and 3, E.O.13526

Having moderately

low perigees, their lifetimes have not been very long.

All have been given Cosmos-series designations.

History. The first few members of this series were launched from Kapustin Yar into orbits of about 49-degree inclination. Five (Cosmoses 36, 76, 101, 116, and 123) were launched between mid-1964 and mid-1966. They had periods of about 92 minutes, their apogees ranged from about 475 to 550 kilometers (256 to 297 n.m.) and their perigees ranged between about 260 and 290 kilometers (141 to 156 n.m.).

Following a hiatus of about 8 months, the Soviets began to launch similar payloads with their SL-7 from Plesetsk. Thus, those launched from KY may have represented a developmental stage. Those launched from Plesetsk were higher in Equatorial inclination -- either about 71 degrees or about 82 degrees. The 71-degree payloads were at first similar in apogee, perigee, and period to the KY launches, but later were more varied. The 82-degree payloads were more eccentric in orbital parameters, having higher apogees (about 1550 kilometers -- 837 n.m.) and lower perigees (about 210 kilometers -- 112 n.m.).

The launch rate has increased since the program was transferred to Plesetsk. Five were launched in 1967 (Cosmoses 152, 165, 173, 176, and 191), five in 1968 (Cosmos 211, 222, 233, 245, and 257), seven in 1969





(Cosmoses 265, 277, 283, 285, 303, 311, and 314), and two in the first 20 days of 1970 (Cosmoses 319 and 321). (Chart on page 39.)

The pattern may have been broken with the 18 October launch from KY of Cosmos 307 which is suspected of being a member of this series. If it is, then the Soviets have launched 6 such payloads in about 3 months, a very rapid launch rate.

25X1 and 3, E.O.13526

Telemetry. Analysis of the [redacted] [redacted] are regularly active when the satellites are in sunlight. But they are not necessarily studying solar phenomena. The periodicity of these signals suggest an almost certain association with the satellite's spin. A theoretical simulation indicates that the data pick-ups are probably flat-plate detectors surrounded by a shallow shield. Apparently arranged in groups of 3, with one group in each hemisphere of the payload, they probably are used to determine the payload's attitude at any given time.

25X1 and 3, E.O.13526

Transmitting lifetimes have not been long (3 or 4 months) but long lifetimes are not needed because the payloads have experienced orbital decay in a short time (3 to 7 months) because of their relatively low perigees and moderate drag characteristics.

The power supply for the payloads' transmissions appears to be a reliable system (probably chemical batteries). [redacted]

25X1 and 3, E.O.13526

Distinctions from Other SL-7 Payloads. These satellites seem to represent a series distinct from other payloads launched by the SL-7. The others are more varied in orbital parameters and transmitting frequencies and some of them are solar-battery powered.

The greatest distinction, however, seems to be the Soviets' silence about missions and operating results. When these craft were launched, TASS said only that they were performing the usual Cosmos research mission. Such announcements are meaningless because:

- The Cosmos mission can cover any of several missions, such as study of any of several types of space radiation or solar radiation, studies of micrometeorite density, study of the ionosphere, photography of cloud cover, test of spacecraft components or systems, and so on.
- The Cosmos label more often than not conceals such classified missions as military reconnaissance, ELINT collection, aid to navi-



gation and test of orbital bombardment systems and maneuvering-satellite systems, as well as payload and propulsion failures of spacecraft successfully orbited.

The Soviets have never mentioned any specific missions for the payloads launched from Plesetsk by the SL-7. In contrast, they have given details of the missions and results of many of the payloads launched by the SL-7 from Kapustin Yar.

Some of these, said TASS, have tested equipment:

- Cosmos 2 tested an ion-sensor orientation system.
- Cosmos 23 tested solar cells and stabilizing equipment for future meteorological satellites.
- Cosmos 97 tested operation of a maser in space.
- Cosmos 149 tested a new gyro-aerodynamic system for attitude control and other equipment.

Others, said TASS, have collected space data:

- Cosmoes 3 and 108 studied erosion caused by micrometeorites.
- Cosmos 8 studied meteor hazards.
- Cosmoes 26 and 49 made geomagnetic field measurements.
- Cosmos 51 measured sky ultraviolet radiation.
- Cosmos 108 studied the relationship between the upper atmosphere and solar activity.
- Cosmos 135 studied the possibility of a dust cloud surrounding the Earth.
- Cosmos 142 measured the influence of the ionosphere on ultralong radiowaves.
- Cosmoes 166 and 230 measured solar-flare radiation.
- Cosmos 196 carried on upper-atmosphere studies.
- Cosmos 215 carried telescopes for astronomical research and measured solar radiation on radiowave frequencies.
- Cosmos 262 measured vacuum ultraviolet and soft X-ray radiation.

Failure of the Soviets to talk about mission results could mean mission failure, but that is not the case here, since all the Plesetsk SL-7 payloads mentioned here have transmitted successfully.

Review. The mission of the small nonrecoverable payloads launched from Plesetsk by the SL-7, as well as of their 5 predecessors launched from Kapustin Yar, is not known, but several features are obviously pertinent to their mission.

- The relatively low perigees must be important, since the Soviets





25X1 and 3, E.O.13526

consistently use them for these payloads despite the fact that it cuts down on orbital lifetime.

- The high orbital inclinations -- of about 71 degrees and 82 degrees -- of the operational craft launched from Plesetsk assure global or near-global coverage if these craft are monitoring terrestrial phenomena.
- The relatively limited [redacted] the chemical batteries, and the low payload-failure rate all are more suggestive of a simple but highly reliable monitoring system than a highly sophisticated environmental data collector.
- The recent accelerating frequency of these launches indicates that the program is of increasing importance to the Soviets, possibly because it is increasingly productive. (For the past 18 months there have never been fewer than two active members of this series in orbit.)
- Soviet silence on the specific mission of any of these craft, in contrast to their willingness to discuss the missions and results of other small nonrecoverable payloads launched by the SL-7, strongly suggests that their mission is classified, and possibly military, irrespective of whether these craft are conducting environmental research, monitoring terrestrial phenomena, or testing equipment.

(CIA; Soviet Press)

~~(SECRET)~~

Designators of Soviet Space Propulsion Systems Listed (U)

A list of the Soviets' known and estimated space propulsion systems, showing the designator given each by Western intelligence, is presented on page 43 as reference material for NORAD intelligence personnel. Drawings of known or estimated configurations of each system are shown on page 42. (This list supersedes the list published on page 14, WIR 1/68).

A few of these systems are no longer in use. The SL-1/SL-2 (SS-6 ICBM booster-sustainer) has not launched a spacecraft since 15 May 1958, the SL-5 since 20 July 1966, and the SL-10 since 12 April 1964.

The SL-9, which has launched only Protons 1, 2, and 3, has not been used since 6 July 1966. These payloads investigated the interaction between high-energy cosmic particles and some selected earthly atomic nuclei, but the primary mission of these launches was to test the large 2-stage SL-9, which comprises the first 2 stages of the SL-12. No SL-9s have been launched since the first SL-12 was launched (10 March 1967).

The SL-3, once used intensively, now launches only meteorological satellites. Because its third (Lunik) stage is inefficient, the SL-3's other tasks have been taken over by the SL-4.

All systems in current use consume cryogenic propellants except for



the first stages of the SL-7 and SL-8 and all stages of the SL-11.
(NORAD)

~~(SECRET)~~

4 Ground Based Computers Hitched In Parallel For Space-Mission Support ~~(S)~~

To support their space missions, the Soviets operate 4 ground-based computers in parallel for purposes of redundancy and handling the large computational load, according to a Soviet scientist. The system is designed so that the computer can work on separate functions simultaneously. Output of the 4-machine setup was said to be only 2 or 3 times that of a single machine; this is consistent with US experience.

The Soviet scientist could have been referring to either 4 separate computers operating simultaneously or 4 computers interconnected in parallel configuration. Four computers truly connected in parallel would be more expensive in both equipment and programing costs than would a single large machine. Moreover, expanding the system's capabilities and applications would probably be very difficult. Intercomputer communications problems, as well as software problems, cascade with the addition of more computers.

US experience indicates, moreover, that adding more computers to the system described would not produce a significant increase in the system's capabilities.

The model of computer involved was not specified but probably differed little, if at all, from known Soviet models, which are not well suited for use in a system that requires several computers to work in parallel.

(CIA)

~~(SECRET)~~ NFD/Releasable to US, UK & Can)

Soviets May Operate Oxygen-Hydrogen Rocket Engines at Higher Pressures Than US Does ~~(S)~~

The Soviets may be operating oxygen-hydrogen rocket engines at combustion-chamber pressures of more than 3,000 pounds per square inch (psi), probably in an experimental or developmental program. A key scientist in the Soviets' cosmonaut and rocket programs, in referring to the US's Pratt & Whitney 3,000-psi oxygen-hydrogen rocket engine, said that the USSR has higher combustion pressures than the US. He did not say how high these pressures were, but he did comment that the maximum theoretical pressure for an oxygen-hydrogen engine within the next 10 years would be slightly more than 5,000 psi.

Oxygen-hydrogen engines are particularly well suited for use in upper staging of interplanetary and lunar spacecraft.

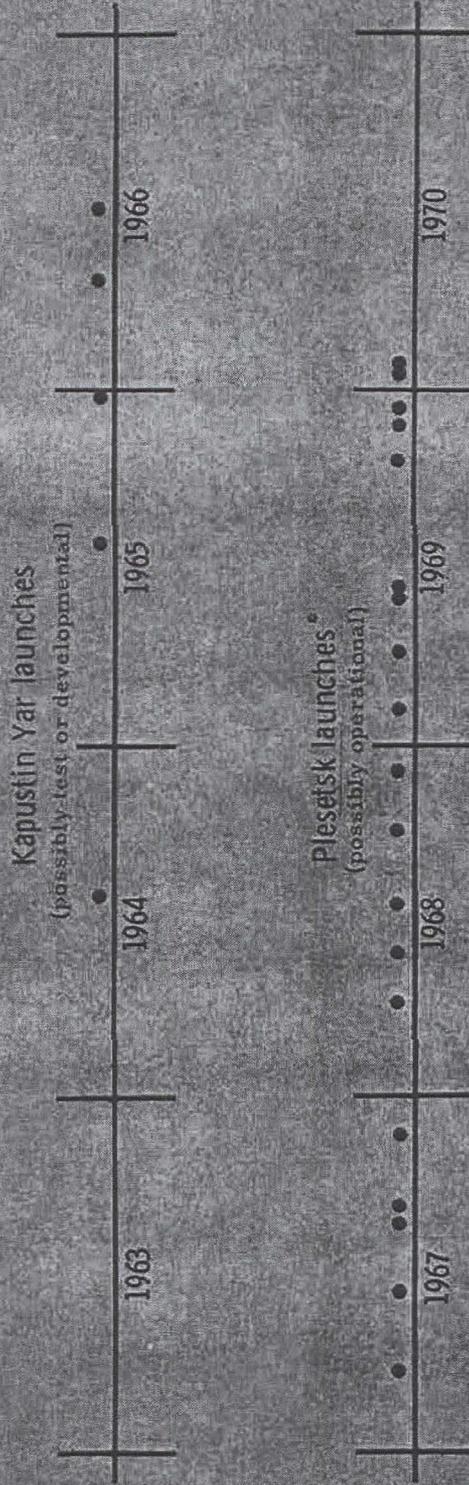
(DIA)

~~(SECRET)~~



~~SECRET~~

Launches of Certain Payloads of Unknown Mission by SL-7 (a time scale) (S)



*Cosmos 307, launched from Kapustin Yar on 18 Oct 69 (not shown here) may also belong to this series.

NOTE:

All Kapustin Yar-launched payloads had orbital inclinations of about 49 degrees. Plesetsk-launched payloads had orbital inclinations of either about 71 degrees or 82 degrees.



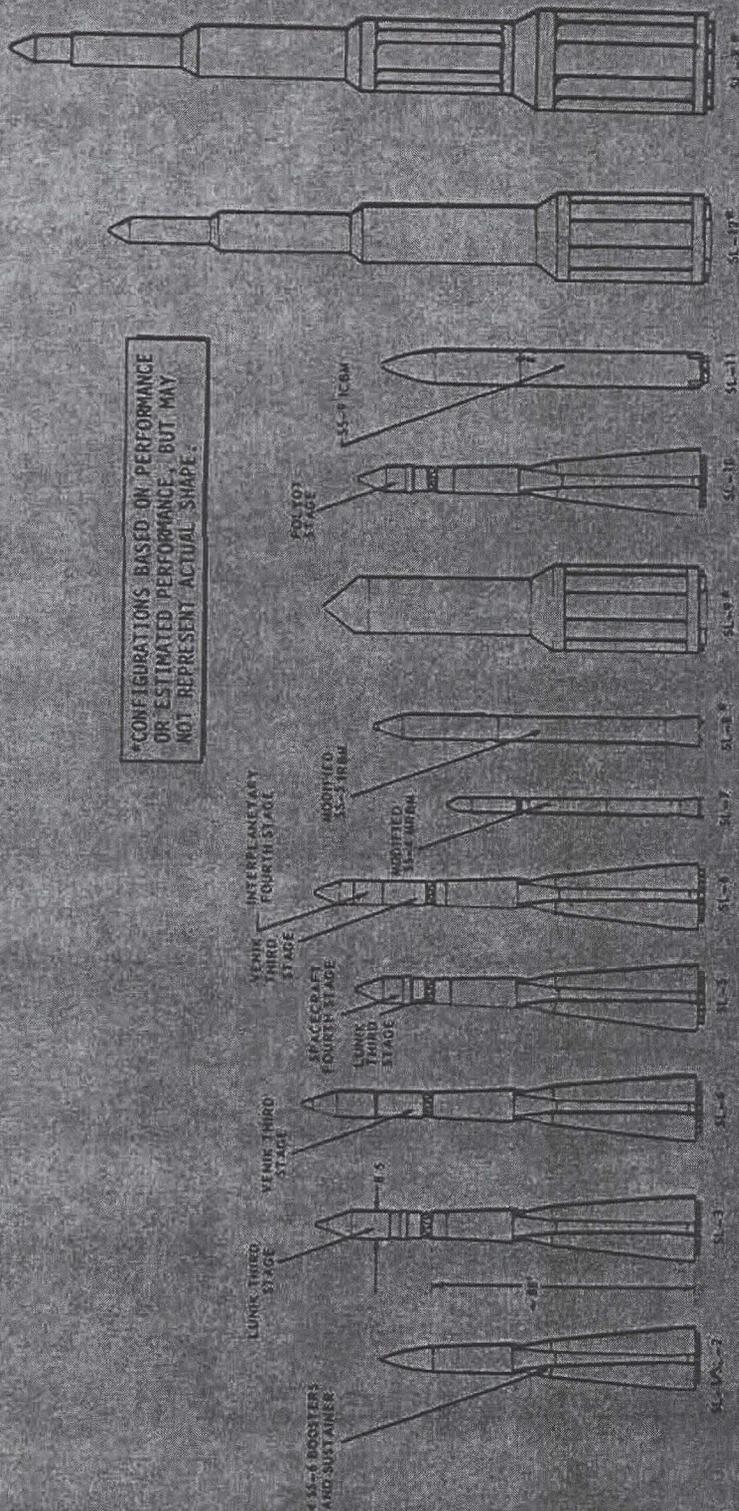
WIR 5/70
30 Jan 70

~~SECRET~~

-39-
~~SECRET~~

~~SECRET~~

Soviet Space Propulsion Systems (U)



*CONFIGURATIONS BASED ON PERFORMANCE OR ESTIMATED PERFORMANCE, BUT MAY NOT REPRESENT ACTUAL SHAPE.

~~SECRET~~

FTD 468-2394

NOVA WIR 5/70
30 Jan 70

~~SECRET~~

NORAD
WIR 5/70
30 Jan 70

Soviet Space Propulsion Systems (U)

Designator	Date of 1st Successful Launch*	Description	Applications, Remarks
SL-1	04 Oct 57	SS-6 ICBM booster/sustainer	Launched Sputniks 1, 2, and 3 only.
SL-2	04 Oct 57	SS-6 ICBM booster/sustainer	Same as SL-1. It was once thought that these were two different launchers.
SL-3	02 Jan 59	SS-6 ICBM plus Lunik 3d stage	Launched early Lunas, recoverable biosatellites and recsats, manned Vostoks, met-sats, and their precursors and prototypes.
SL-4	16 Nov 63	SS-6 ICBM plus Venik 3d stage	Launches manned Voskhods and Soyuzes and recoverable recsats and their precursors and prototypes.
SL-5	27 Dec 65	SL-3 plus maneuverable 4th stage	Launched only maneuverable Cosmoses 102, and 125.
SL-6	12 Feb 61	SL-4 plus 4th ("interplanetary") stage	Launched Interplanetary craft, most Lunas, Molniya comsats, and certain research satellites sent into high-eccentric orbits.
SL-7	16 Mar 62	SS-4 MRBM plus 2d stage	Launches small nonrecoverable satellites.
SL-8	21 Feb 65	SS-5 IRBM plus restartable 2d stage	Launches single, multiple payloads, including ELINT collectors, navsats, possible communications relay satellites; launched two vertical probes to high apogee.
SL-9	16 Jul 65	Large 2-stage launcher	Launched Protons 1, 2, and 3 only.
SL-10	01 Nov 63	SS-6 ICBM plus maneuverable 3d stage	Launched Polyots 1 and 2 only.
SL-11	16 Dec 65	SS-9 ICBM plus payload with propulsion capabilities	Variant A: Launches Soviet fractional orbit bombardment systems. Variant B: Launches maneuverable spacecraft.
SL-12	10 Mar 67	SL-9 plus 2 upper stages	Launched latest lunar probes and their prototypes and two unsuccessful Mars probes.
SL-X	---	New, reported vehicle larger than the US's Saturn	Will probably launch lunar and Interplanetary spacecraft.

*In many cases the initial launches (not shown here) were unsuccessful.