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NORTH AMERICAN AIR DEFENSE COMMAND

WOR

WEEKLY INTELLIGENCE REVIEW (U)

K410.607-185

INTELLIGENCE

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30 Oct 1964

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NORAD Weekly Intelligence Review

K410.607-185

Issue No. 44/64, 30 October 1964

The WIR in Brief

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COVER: CLASSIC/IL-12 transport (from Aviation Week) (OFFICIAL USE ONLY)
NOTE: Pages 30, 31, 34, 35, and 38 of this issue are blank.

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Missile Range Firing Log Presented

US radar detected the following Soviet missile launches between 2400Z, 12 October, and 2400Z, 26 October 1964:

Time & Date	Type	Launch Site	Range
0959Z, 14 Oct	Cosmos 48*	Tyuratam	Orbital
0245Z, 20 Oct	SS-10 ICBM	Tyuratam	6500 n.m.
0400Z, 24 Oct	Cosmos 49#	Kapustin Yar	Orbital
0828Z, 16 Oct	SS-4 MRBM	Kapustin Yar	1050 n.m.
1213Z, 16 Oct	Unknown	Kapustin Yar	500 n.m.
1343Z, 16 Oct	SS-3 MRBM	Kapustin Yar	650 n.m.

* Launched by SS-6 ICBM booster-sustainer and light Lunik upper stage.
\# Launched by unidentified 2-stage vehicle.
(Shemya and Diyarbakir RADINT)
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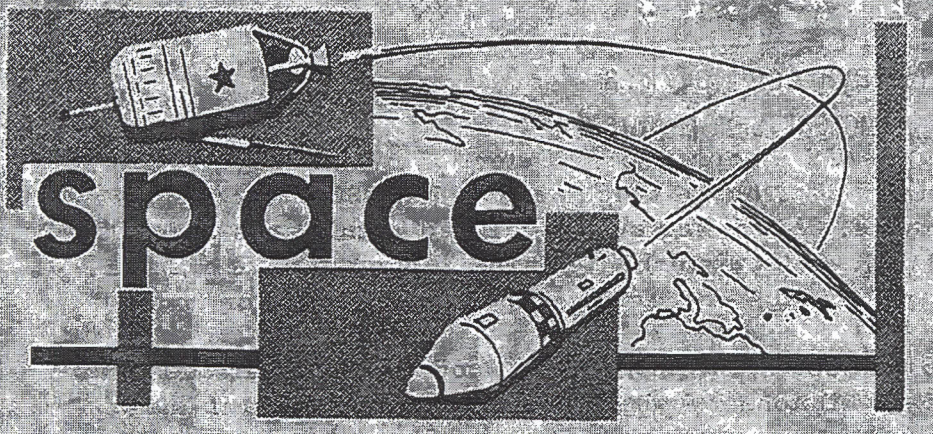

significant intelligence on space developments and trends

CORRECTIONS: 2 Errors in Interplanetary Probe Charts in Last Week's WIR

Two errors appeared in the charts pertaining to interplanetary probes in last week's WIR:

- Page 24: The explanation said, "The 1962 launches came in pairs." It should have said that they came in 3s; thus, a third Venus probe launch might have been expected when the "window" was open in the spring of 1964.
- Page 25: The date of opposition of Mars and the Earth -- their closest approach to each other -- was given as 18 July 1965: this should have read "9 March 1965." July 18 is the date of arrival of the probe postulated in the chart.

(NORAD)

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Cosmos 49 Apparently a Routine Scientific Research KY Vehicle

Cosmos 49, which was launched from the Kapustin Yar (KY) missile test range at about 0400Z, 24 October 1964, appears to be a standard KY Cosmos-series vehicle. Its mission probably is scientific research, as claimed by the Soviet news agency TASS.

Orbital parameters of the new vehicle, which are very similar to those of Cosmos 36 (launched 30 July 1964), have been furnished as follows:

	SPADATS	TASS
Inclination to Equator	48.8 degrees	49 degrees
Orbital Period	91.33 minutes	91.83 minutes

Apogee	428 kilometers	490 kilometers
	231 n.m.	265 n.m.
Perigee	258 kilometers	260 kilometers
	139 n.m.	140 n.m.

(SPADATS; TASS)
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Space Listing and Over-all Space Situation Report Presented

The over-all space-vehicle situation as of 1300Z, 28 October 1964, was as follows:

	US	UK	Can	USSR	Total
Payloads in Earth orbit	107	2	1	18	128
Payloads in Sun orbit	5			4	9
Payloads in Earth-Moon orbit				1	1
Pieces of debris in Earth orbit	325	1	2	16	344
Pieces of debris in Sun orbit	5				5
Payloads impacted on Moon	3			1	4
TOTALS	445	3	3	40	491
Objects decayed or de-orbited	209			223	432

A listing of Soviet payloads and their principal orbital parameters is shown on page 37.
(SPADATS)
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Cosmos 50 Believed to Be Another Photorecce Vehicle, the 4th with 51-degree Orbit

The Soviets launched Cosmos 50 from Tyuratam at about 1040Z, 28 October, into an orbit having an Equatorial inclination of a nominal 51 degrees; it is the 4th vehicle of this series to have the 51-degree inclination. (For other orbital parameters of Cosmos 50, see page 37.) Cosmos 50's mission is believed to be photoreconnaissance and, therefore, it will probably be recovered. It is the 12th estimated Soviet photoreconnaissance vehicle launched this year, and it follows launch of the last previous vehicle in this series (Cosmos 48) by only 14 days.
(SPADATS; NORAD)
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technical intelligence NOTES

items of interest on technical developments around the world

$$\int_0^3 \frac{dx}{(x+1)^{\frac{3}{2}}} = \frac{3}{10}\sqrt{10}$$

DESNA-Class Instrumentation Ships Could Support Missile and Space Programs for Years to Come

The facilities of the Chazhma and Chumikan, the two DESNA-Class Soviet missile-range instrumentation ships (SMRISs) which first saw operation in late 1963 in the Pacific, are believed to be adequate for support of the Soviet missile and space programs for several years to come. (SMRISs deploy to the central or north-central Pacific at irregular intervals, for months at a time, to monitor the re-entry of Soviet ICBMs fired to Pacific Ocean impact areas and to aid in tracking and monitoring certain Soviet space vehicles (such as the manned vehicles) on Zero Orbit after launch from Tyuratam.)

The DESNA-Class SMRISs are believed to have been built in the Warnow Shipyard in Warnemuende, East Germany, delivered to the USSR in late 1962, outfitted in the Kronshtadt Shipyard (near Leningrad), and transferred to the Pacific in mid-1963, making the transit via the Northern Sea Route during the summer of that year. (Photos on pages 32 and 36)

The instrumentation of the Chazhma and Chumikan is more advanced and complete than that installed on the older, smaller SIBIR-Class SMRIS (the Sibir, Sakhalin, Suchan, and Chukotka) which first saw operation in 1959.

The 3 main divisions of the DESNA-Class superstructure consist of:

- The forward structure supporting 3 stabilized platforms.
- The mainhouse amidships, with a large dome mounted on top.
- The afterhouse with the double-cone structure atop it.

The deck above the fantail is used as a heliport, with part of the afterhouse serving as a hangar for the helicopter.

The numerous antennas visible aboard the Chazhma and Chumikan can be placed in 3 categories.

Inverted-L Wire Antennas. Two 50-foot inverted-L wire antennas serve for communications in the 300-500 kc/s range. The use of double insulators and potential grading rings for support indicates that these are electrically short

antennas which have low resistance and high reactance and which require a relatively high exciting potential for any usable power input. Potential grading rings are installed to reduce the probability of losses caused by the formation of corona.

HF and VHF Communications Antennas. Various whip and wire antennas and vertical and horizontal dipoles provide HF and VHF communications at discrete frequencies approximately as follows: 4.5, 6.5, 8, 9, 11.5, 12, 13.5, 15, 24, 90, 125, and 150 mc/s. Three VHF discone antennas which are visible would be useful in the 75-150 mc/s band. Three other antennas which have been noted are probably TV antennas used for crew entertainment while the ships are in port. There is also a conventional HF/DF loop.

The most conspicuous communications antenna is the large VEE CONE mounted above the afterhouse on both ships. Consisting of a pair of cones about 10 meters (33 feet) long and about 1 meter (3.3 feet) across at the widest end, VEE CONE helps to provide broad-band coverage, its estimated useful frequency range being about 5.5-20 mc/s. Because it is mounted nearly 33 meters (109 feet) above the waterline, it provides useful radiation at low vertical angles over its entire frequency range. Most of its electrical members double as structural support, thereby reducing the sensibility of mutual coupling and reflection problems occasioned by the numerous structural supports which litter today's highly instrumented ships. VEE CONE is most likely used for ship-to-shore communications; ship-to-satellite communications are possible, but less likely because there may be fading due to multiple lobing effects of the vertical radiation pattern. (For more on VEE CONE, see pp. 20-22, WIR 33/64.)

Tracking and Data-Acquisition Devices. All the tracking and data-acquisition devices on the Chazhma and Chumikan are positioned to give clear coverage 90 degrees to each side of the ship's bow. During normal operations, therefore, the ships are probably positioned somewhat off the flight path of the vehicle to be tracked, bow-on to the Earth trace of the vehicle's trajectory.

The principal tracking and data acquisition systems are mounted on the mainmast, the mainhouse, or the forward structure.

The 10.7-meter-diameter radome atop the mainhouse encloses the 5.2-meter-diameter dish of the SHIP GLOBE radar; operating in the 2800-mc/s portion of S band, this radar is used for tracking missiles during reentry, and space vehicles. Its maximum ranges are believed to be:

- 2500 kilometers (1340 n.m.) -- the PRF limit -- when used as a beacon interrogator.
- 370 kilometers (200 n.m.) against a 10-square-meter target when used as an active radar tracker.

It is an improvement over the SHIP WHEEL radar, of similar function, which is mounted on 3 of the SIBIR-Class ships -- Sibir, Suchan, and Sakhalin.

SHIP GLOBE also is probably used as a pointing device for the radiation, optical, and/or IR equipment in the 3 modified gun directors on the bow of the ship.

Little information is available concerning the type of equipment in the 3 mounts on the forward part of the ship, which appear to provide stable platforms for precision-quality IR/optical tracking and photographic equipment. If these mounts are like those on the SIBIR-Class ships, the forward one is a converted ROUND TOP director from a SVERDLOV-Class cruiser secondary battery, and the after two are converted WASP HEAD directors from a RIGA-Class destroyer escort. The island mounting of these 3 platforms is probably mechanically isolated from the ship to minimize bending moments.

Two HEAD NET search radar antennas are mounted back-to-back at a height of 34 meters atop the mainmast, replacing the BIG NET long-range, early-warning search radar used on the SIBIR-Class SMRISs. The central mount for the HEAD NET antennas appears to be stabilized so as to maintain the main axis parallel to local vertical. This feature would provide fixed vertical coverage of the antenna relative to the horizon and thus eliminate azimuth-angle errors inherent in a system fixed rigidly to the ship.

Each of the DESNA-Class SMRISs, as well as the SIBIRS, carries 2 helical FRAME SPRING antennas for reception of telemetry in the range of 60-75 mc/s.

Two apparently identical canvas-covered cinecameras or other optical sensors are mounted on the center platform. Other possible optical devices, such as cameras and telescopes, which could be damaged by the elements, are mounted on stable platforms within enclosures.

(FTD)

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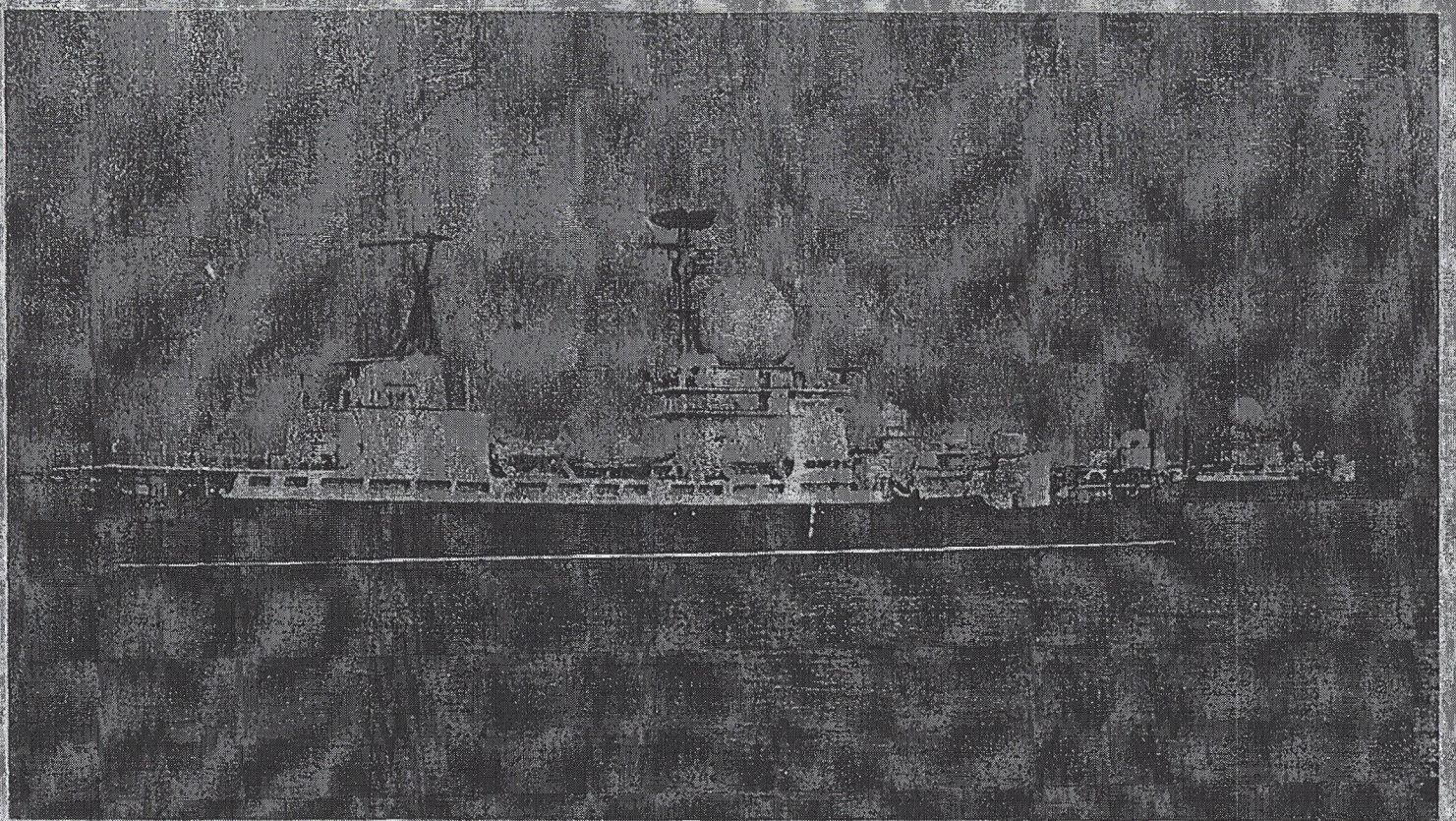
Portion identified as non-responsive to the appeal

Chumikan and Chazhma, DESNA-Class Soviet Missile Range Instrumentation Ships (SMRISs)



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SIBIR'-Class SMRISs (Soviet missile-range instrumentation ships)

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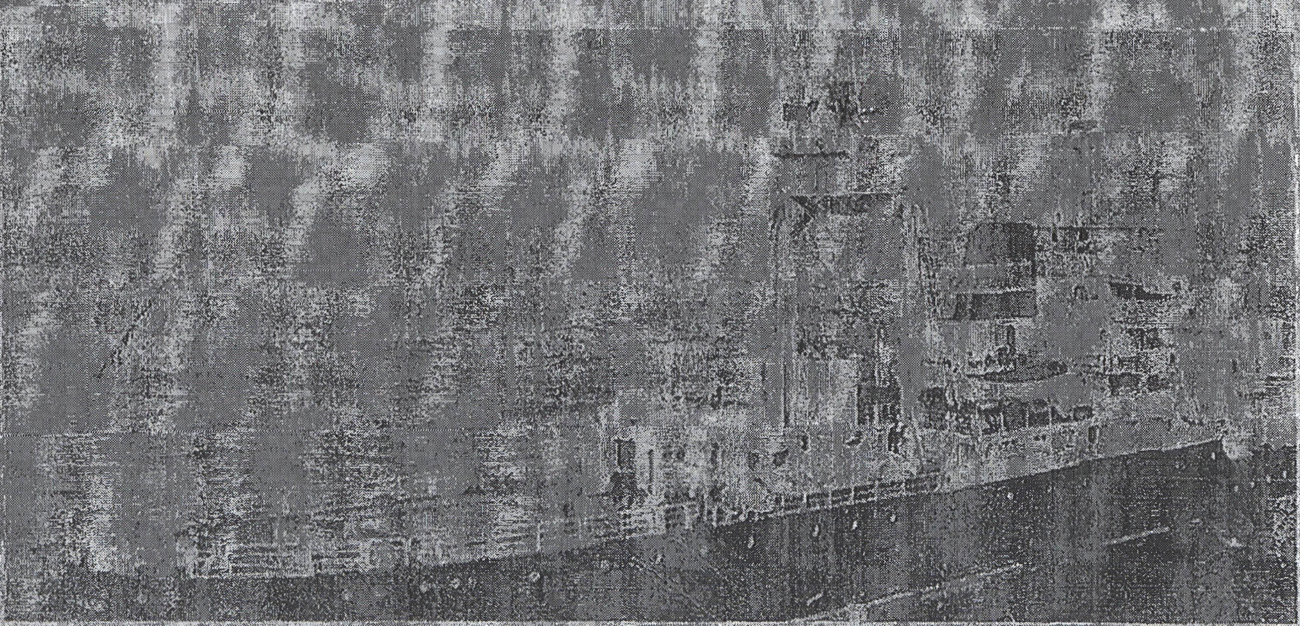

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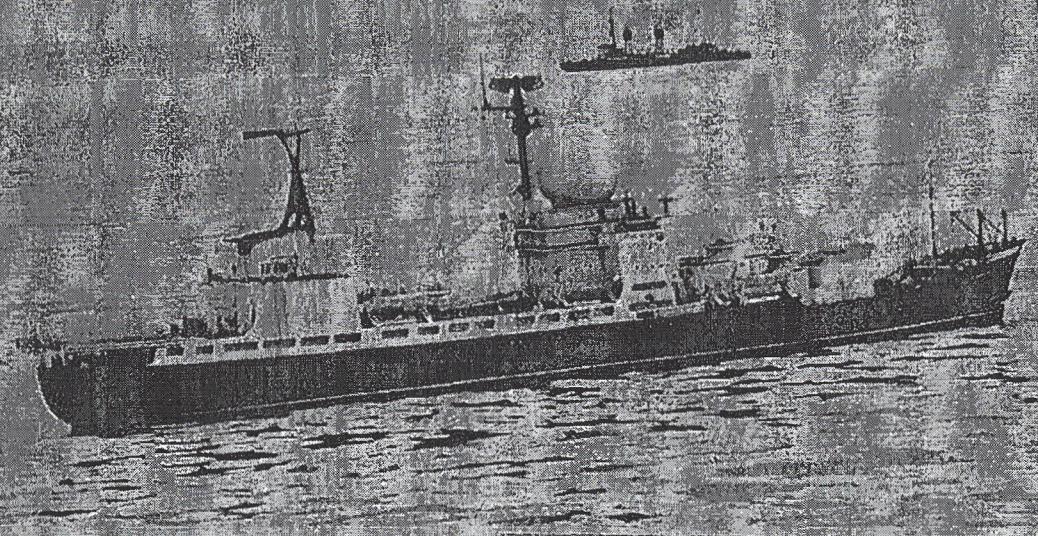
DESNA-Class Soviet Missile-Range Instrumentation Ships (SMRISs) in the Pacific

The Chumikan



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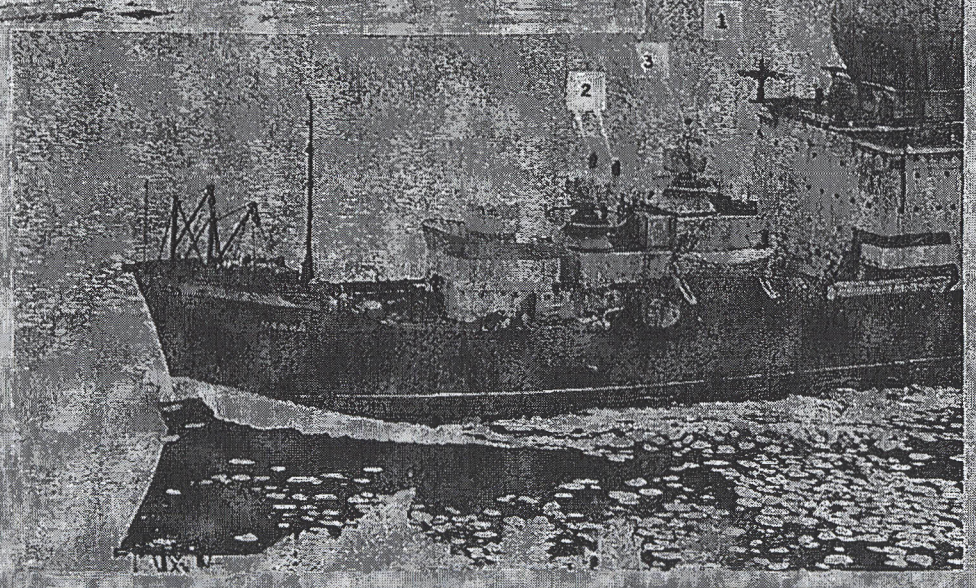
The Chazhma



The large radome houses a 17-foot parabolic antenna

1) 2 FRAME SPRING telemetry antennas

2) 2 small canvas-covered probable parabolic reflectors

3) Tripod probably accommodating optical equipment

Soviet Space Vehicle Listing, as of 28 October 1964

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Soviet Vehicles in Earth Orbit

Soviet Designation	Launch Date	Inclination to Equator (degrees)	Period (Minutes)	Apogee (kilometers)	Perigee (kilometers)	Life Expectancy or Decay Date
Cosmos 17	22 May 63	48.98	92.3	565.6	248.6	4th Qtr., 1965
Polyot 1	1 Nov 63	58.92	102.1	1406.2	336.1	Over 10 years
Electron 1	30 Jan 64	60.69	169.3	7120.1	400	Over 50 years
Electron 2	30 Jan 64	60.03	135.3	67838.8	582.6	Over 50 years
Cosmos 25	27 Feb 64	49.03	90.1	398.8	251.8	Dec 1964
Polyot 2	12 Apr 64	58.05	92.2	462.3	306.5	1967
Electron 3	10 Jul 64	60.86	168.2	7027.0	402.7	Over 50 years
Electron 4	10 Jul 64	60.77	1313.9	66283.1	458.5	Over 50 years
Cosmos 36	30 Jul 64	49.0	91.9	506.7	256.1	May 1965
Cosmos 38	18 Aug 64	56.3	92.5	817.9	210.0	3-5 Nov 1964
Cosmos 39	18 Aug 64	56.1	92.5	859.7	211.5	16-18 Nov 1964
Cosmos 40	18 Aug 64	56.1	92.5	758.7	212.8	17-20 Nov 1964
Cosmos 41	22 Aug 64	64.8	714.5	39758.5	440.5	Over 50 years
Cosmos 42	22 Aug 64	48.97	98.0	1122.0	235.1	1st Qtr., 1966
Cosmos 43	22 Aug 64	48.98	97.7	1104.9	229.5	1st Qtr., 1966
Cosmos 44	28 Aug 64	65.01	99.3	820.7	663.2	Over 50 years
Cosmos 49	24 Oct 64	48.88	91.29	440.3	263.5	
Cosmos 50	28 Oct 64	51.42	89.02	263.3	188.4	

Soviet Vehicles in Heliocentric (Sun) Orbit

		Inclination to Ecliptic (degrees)	Period (Days)	Aphelion (In AUs)*	Perihelion (In AUs)*	
Lunik 1	2 Jan 59	0.01	449.5	1.315	0.9766	Indefinite
Venus probe	12 Feb 61	0.58	300	1.019	0.7183	Indefinite
Mars 1	1 Nov 62	2.683	519.1	1.603	0.9237	Indefinite
Zond 1	2 Apr 64	(Not Available)				

Soviet Vehicles in Barycentric (Earth-Moon) Orbit

Lunik 4	2 Apr 63	(Not Computed)

Soviet Vehicles Resting on Surface of the Moon

Lunik 2	12 Sep 59	(Not Applicable)

* AU — astronomical units, roughly 1 AU — 93 million miles (mean distance from Earth to Sun).

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