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NORTH AMERICAN AIR DEFENSE COMMAND

WIR

WEEKLY INTELLIGENCE REVIEW (U)

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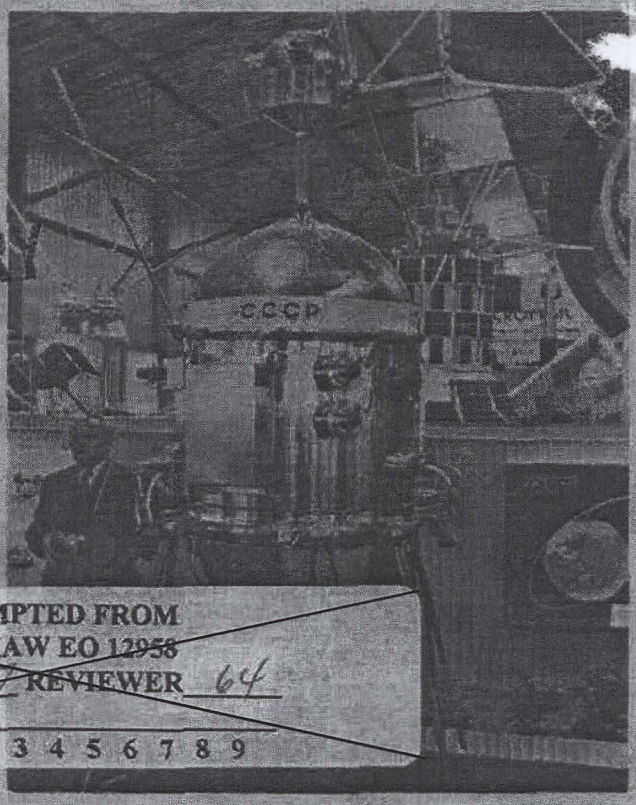

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NORAD Weekly Intelligence Review

Issue No. 46/67, 17 November 1967

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The WIR in Brief

Communist Military Capabilities

OCTOBER A RECORD MONTH FOR MISSILE, SPACE LAUNCHES 2
51 firings -- 39 missile, 12 space.

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Space

PHOTORECCE COSMOS 190 DE-ORBITED ON TIME
Flew normal 8-day pattern.
WEATHER DATA FROM COSMOS 184 STARTS ARRIVING OVER 'HOT LINE'
But Cosmos 184 not yet named weather satellite.
VENUS 4 EXECUTES MISSION PROBABLY INTENDED FOR VENUS 3
Known details of mission recounted.

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Portion identified as non-responsive to the appeal

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COVER: Soviet space payload at Paris Air Show 1967 (OFFICIAL USE ONLY)

NOTE: Pages 28, 30, 31, 34, 35, 38, 39, 42, 43, 46, and 47, of this issue are blank.

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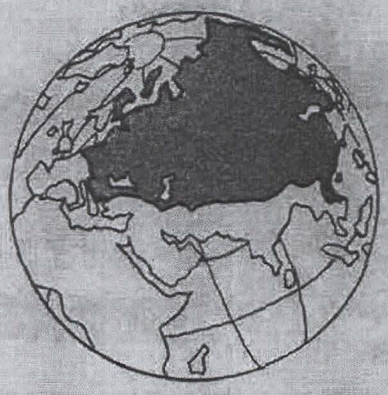
COMMUNIST MILITARY CAPABILITIES



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

October a Record Month for Missile, Space Launches

Soviet missile and space-launch activity reached record levels during October 1967. There were 51 launches (listing on page 29)--39 missile and 12 space, records for both categories. All 51 launches appear to have been successful.

Most of the missile launches appear to have been involved in troop training. Exceptions were R&D launches of the KY-6 and KY-8.

Notable missile events during October: (The space events were summarized on page 7, last week's WIR.)

- 2 launches of the KY-6, a 3-stage, solid-propellant ICBM, to a range of about 4700 n.m., from Plesetsk to an impact area in the Pacific. (These were the first launches of this missile to ICBM ranges.)
- A launch of the KY-8, a single-stage liquid-propellant missile, to a range of 1,350 n.m. in the Northern Fleet area. (This is the longest known flight of a Soviet naval missile. Because of this launch, the KY-8 is now being postulated as a follow-on SLBM (submarine-launched ballistic missile), instead of an MRBM, although both categories are possibilities.)
- A launch of an SS-8 ICBM, the first known firing of this missile since July 1966. (This missile has been deployed in only limited numbers.)
- A launch of two SS-11 ICBMs within 30 minutes on 29 October, suggestive of a multiple launch attempt.
- 6 vertical launches (not including the high-apogee launch of 12 October, which is counted as a space event), a relatively high number for one month. (Their missions probably were associated with solar-flare activity, and measurement of upper atmosphere parameters.)

The unusually large number of missile launches in the 1st and 4th weeks (14 and 16, respectively) suggests rehearsals for mass firepower demonstrations.
(NORAD)
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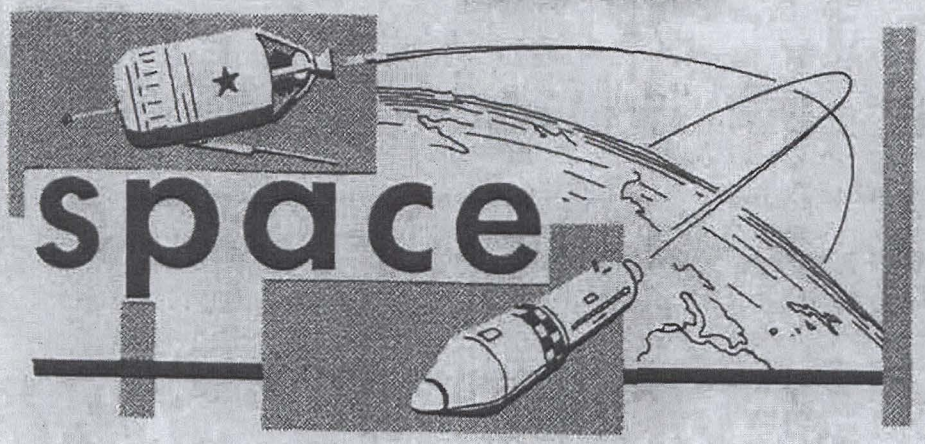

significant intelligence on space developments and trends

Photorecce Cosmos 190 De-orbited on Time

Cosmos 190, a high-resolution photoreconnaissance satellite which the Soviets launched from Plesetsk on 3 November, was de-orbited on 11 November during the early part of Revolution 125. Impact in the USSR could have occurred at about 0620Z. The 8 days in orbit of Cosmos 190 is the normal period for Soviet recce satellites.

Cosmos 190 was the Soviets' 22d known military recce satellite of 1967; 23 were launched in all of 1966.

(NORAD)

~~(SECRET)~~

Weather Data from Cosmos 184 Starts Arriving over 'Hot Line'

After a lapse of 1.5 months, the Soviets have resumed transmission of information from a weather satellite over the Moscow-Washington meteorological 'hot line.' Cloud cover photos are being received over the line from Cosmos 184, which the Soviets have not yet announced specifically as a weather satellite. These pictures are not being received within the 6 hours required by the US-USSR agreement on exchange of weather data from satellites, and some of the pictures are of low quality.

(CIA)

~~(SECRET)~~

Venus 4 Executes Mission Probably Intended for Venus 3

Venus 4, which landed on the planet Venus after a 128-day flight and sent back data on the Venusian atmosphere after descending

through it, apparently executed the mission intended for Venus 3. The latter, launched 12 November 1965, probably impacted on Venus on 1 March 1966 but transmitted no information to Earth after it separated from the main payload.

The sameness of missions of Venus 4 and Venus 3 is suggested by similarities in configuration of Venus 4 (as portrayed in a recent issue of Pravda) with that of models of Venus 3 which were displayed at the 1967 Paris Air Show and at Expo 67 in Montreal (pages 41 and 44). Also, TASS said that the designers of Venus 4 capitalized on the experience gained in the designs of Venus 2 and Venus 3.

The Venus 4 Entry Capsule. The entry capsule of Venus 4, as depicted in a recent issue of Pravda, was probably located at the "bottom" of the Venus 4 payload (page 41). The same was probably true also of Venus 3.

TASS said that the capsule was covered by an ablative layer, probably the dark thick material which covers its bottom half in the photo on page 41. The inlets visible in this picture may have been intended to accommodate atmospheric sampling sensors or extensible stabilizing legs. The smaller diameter of the top half of the capsule shown in Pravda probably was also covered by a heat shield which has been removed here for display purposes. Instrumentation and possible antennas can be seen in cavities in the portion just above the capsule centerline.

The parachute assembly for braking the capsule's descent is apparently packed under the removable metal dome at the top. TASS said that this system was blasted away on landing, so that surface winds acting on the parachute would not cause the capsule to topple.

A simple but original damper reportedly was devised to prevent the capsule from oscillating as it entered the atmosphere.

TASS said that the weight on the capsule's payload was distributed in such fashion that the capsule would automatically come to an upright position when it landed. It was so buoyant, TASS said, that it would not sink in water or even in a liquid as light as benzine. Also, a special mechanism would push the antennas to the surface if the capsule did submerge.

TASS said that the capsule also carried a gold coat-of-arms of the USSR, probably similar or identical to that which had been carried by Venus 3 (page 41, WIR 10/66).

The Descent, As Described by TASS. The landing capsule remained attached to the main "bus" of the spacecraft until it encountered the atmosphere of Venus, according to TASS. This occurred about 400-500 kilometers (215-270 n.m.) from the planet. The vehicle was then traveling at the "second escape velocity" (the speed of a body orbiting the Sun). As Venus 4 entered the atmosphere, the capsule

detached itself from the main payload. Atmospheric braking reduced its speed, raising its outside temperature, said TASS, to about 15,000 degrees F. The parachute system was deployed when the rate of descent had slowed sufficiently, at an altitude of about 25-20 kilometers (13.5-10.8 n.m.). Then began a descent of about 1.5 hours to the surface of the planet. The probe's speed during the early part of the parachute descent was about 33 feet per second, gradually declining to about 10 feet per second as the density of the atmosphere increased. The capsule landed on Venus with the speed of a body falling to the Earth from a distance of about 20 inches (the height of a chair seat), according to TASS.

The descent was said to be smooth, that is, the capsule was not tossed up and down by air currents.

Data was transmitted during the descent and possibly from the surface of Venus.

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Venus 4 Data. The Soviets report that measurements made and transmitted by the Venus 4 lander indicated that:

- The atmospheric temperature rose during the descent from 40 to 280 degrees C (104 to 536 degrees F.).
- Atmospheric pressure rose from 1 to 15 Earth atmospheres during the descent. (The maximum figure was given later as 22 Earth atmospheres.)
- The atmosphere of Venus consisted almost exclusively of carbon dioxide, with 1.5% oxygen and water vapor, and no trace of nitrogen. Later the Soviets gave the CO_2 content as 90-95%.

The Soviets also said that no radiation belts or noticeable magnetic fields were detected as Venus 4 neared the planet. A weak hydrogen corona was noted.

The atmospheric temperatures reported by Venus 4 are lower

than those suggested by measurements made by the US's Mariner 2 in 1962. But the Soviet data, based on direct measurements, undoubtedly will be accepted by the world scientific community unless and until another Venus lander returns different information.

The lack of nitrogen content in the Venusian atmosphere surprised US scientists who had estimated that the nitrogen content might be as high as 60%. Again, the Soviet figure will probably stand, since it is based on direct measurements.

The US's Mariner 5, which passed by Venus one day after the Venus 4 capsule impacted on the planet, detected a glowing hydrogen corona about 1,800 miles from Venus. This does not necessarily contradict the Soviet finding of only a weak hydrogen halo, since the US probe obtained its data on a Sun-illuminated side of the planet, while the Soviet probe took its data on the dark side.

TASS also said that 114 communications sessions were held with the main Venus 4 payload while it was en route to Venus, during which data on the interplanetary environment was transmitted.

Significance. The Venus 4 event was one of the outstanding achievements of the still-youthful space age. Successful transmission of data obtained directly from the atmosphere of Venus is a feat which will increase considerably Soviet prestige in the world scientific community. This is the first data obtained directly on the atmosphere of another planet. The Soviet information will set to rest some of the controversy which has long surrounded study of the Venusian atmosphere.

Hitting Venus is a tribute to the accuracy of Soviet passive spacetracking systems, computational systems, and command and control systems. Executing a parachute descent through an atmosphere about which little was known was also a notable technological feat.

Successful completion of the flight itself indicates that the Soviets have come far in overcoming the difficulties which have plagued their interplanetary program since the first launch in October 1960. All 16 previous attempts (6 to Mars, 10 to Venus) failed, usually because of either upper-stage propulsion failure or because communication was lost before the probes reached their target planets. (See p. 45.)

It may be noted, in this connection, that a second Venus probe this year, Cosmos 167, launched 4 days after Venus 4, failed on the attempt to send it into a trajectory toward Venus. This brings to 17 the total number of Soviet interplanetary failures. It is not known whether this probe was intended as a backup for Venus 4 or whether it was to execute a data-taking flyby to supplement the Venus 4 data. (TASS; DIA; CIA; NORAD)

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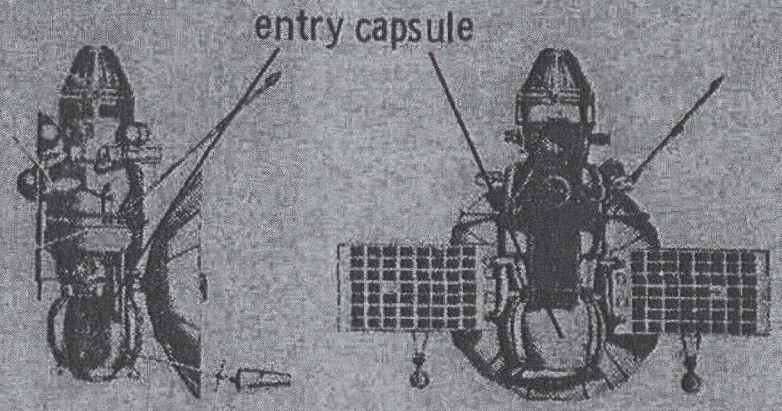
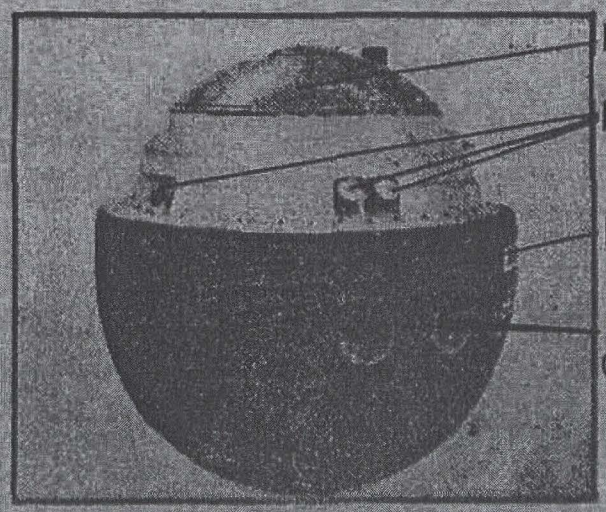
Missile/Space Launches, October 1967

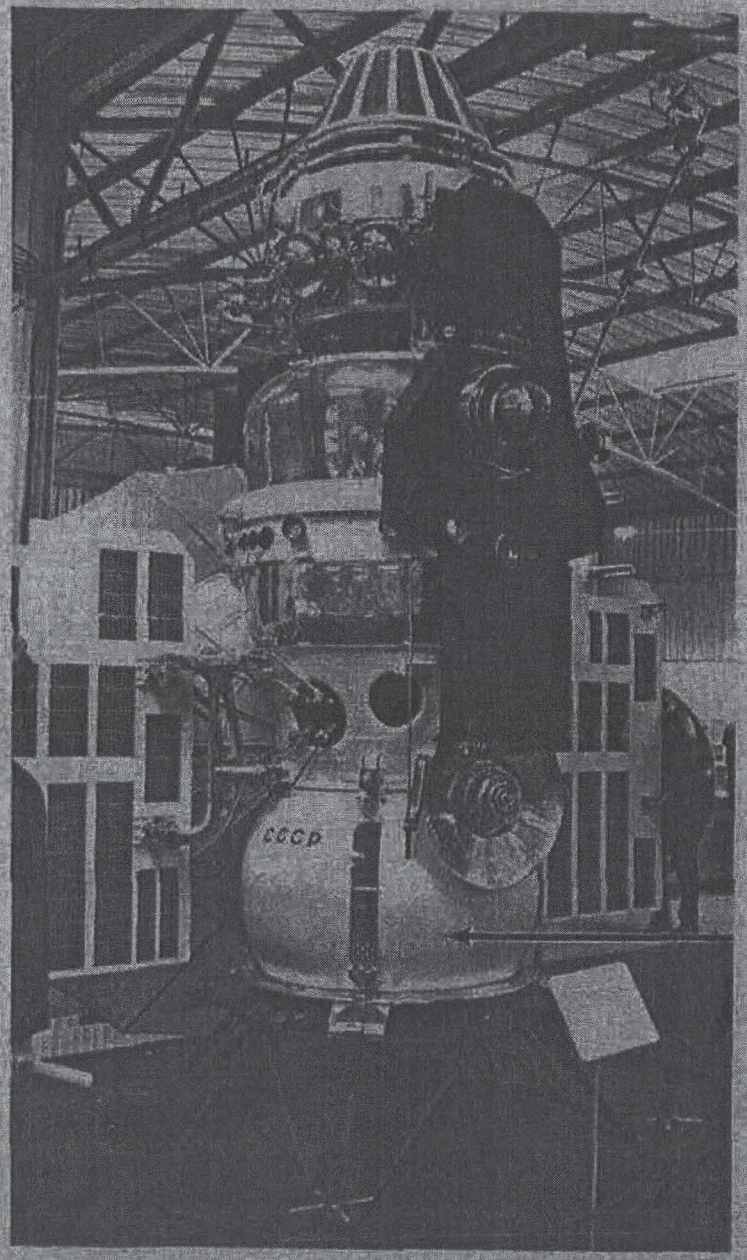
Launch Time & Date	Vehicle	Launch Site
0309Z 01 Oct	SS-9 ICBM	Tyuratam
0439Z 02 Oct	SS-11 ICBM	Tyuratam
0700Z 02 Oct	KY-8 SLBM	Northern Fleet
1256Z 02 Oct	SS-7 ICBM	Tyuratam
1323Z 02 Oct	SS-5 IRBM	Kapustin Yar
1503Z 02 Oct	SS-12 SRBM	Kapustin Yar
0500Z 03 Oct	6th Molniya (SL-6)	Tyuratam
0650Z 03 Oct	SS-7 ICBM	Tyuratam
1143Z 04 Oct	SS-5 IRBM	Kapustin Yar
1200Z 04 Oct	SS-7 ICBM	Plesetsk
1243Z 04 Oct	SS-4 MRBM	Kapustin Yar
1654Z 04 Oct	SS-12 SRBM	Kapustin Yar
0731Z 04 Oct	SS-4 MRBM	Kapustin Yar
1552Z 05 Oct	SS-12 SRBM	Kapustin Yar
0425Z 06 Oct	SS-11 ICBM	Tyuratam
0450Z 09 Oct	SS-7 ICBM	Tyuratam
0701Z 11 Oct	SS-7 ICBM	Plesetsk
1130Z 11 Oct	Cosmos 181 (SL-4)	Plesetsk
1212Z 12 Oct	Vertical (SL-8)	Tyuratam
0704Z 13 Oct	SS-7 ICBM	Tyuratam
0759Z 16 Oct	Cosmos 182 (SL-4)	Tyuratam
1330Z 18 Oct	Cosmos 183 (OB-1)	Tyuratam
0354Z 19 Oct	Vertical	Kapustin Yar
1418Z 20 Oct	Vertical	Kapustin Yar
0841Z 22 Oct	7th Molniya (SL-6)	Tyuratam
0451Z 23 Oct	SS-11 ICBM	Tyuratam
0606Z 23 Oct	SS-4 MRBM	Kapustin Yar
1826Z 23 Oct	KY-6 ICBM	Plesetsk
0735Z 24 Oct	SS-4 MRBM	Kapustin Yar
1404Z 24 Oct	Vertical	Kapustin Yar
2250Z 24 Oct	Cosmos 184 (SL-3)	Plesetsk
0340Z 25 Oct	Vertical	Kapustin Yar
0731Z 25 Oct	SS-4 MRBM	Kapustin Yar
1435Z 25 Oct	Vertical	Kapustin Yar
0706Z 26 Oct	SS-4 MRBM	Kapustin Yar
1222Z 26 Oct	SS-7 ICBM	Tyuratam
0222Z 27 Oct	Cosmos 185 (SS-9)	Tyuratam
0621Z 27 Oct	SS-4 MRBM	Kapustin Yar
0700Z 27 Oct	SS-7 ICBM	Tyuratam
0930Z 27 Oct	Cosmos 186 (SL-4)	Tyuratam
0448Z 28 Oct	SS-5 IRBM	Kapustin Yar
0752Z 28 Oct	SS-4 MRBM	Kapustin Yar
1314Z 28 Oct	Cosmos 187 (OB-1)	Tyuratam
1356Z 28 Oct	Vertical	Kapustin Yar
0350Z 29 Oct	SS-11 ICBM	Tyuratam
0420Z 29 Oct	SS-11 ICBM	Tyuratam
1826Z 29 Oct	KY-6 ICBM	Plesetsk
0801Z 30 Oct	SS-7 ICBM	Plesetsk
0314Z 30 Oct	Cosmos 188 (SL-4)	Tyuratam
1758Z 30 Oct	Cosmos 189 (SL-8)	Plesetsk
1107Z 31 Oct	SS-8 ICBM	Tyuratam

Venus 4 Drawings (Pravda)



Entry capsule of Venus 4 (Pravda)





Venus 3 Model
(Paris Air Show, 1967)

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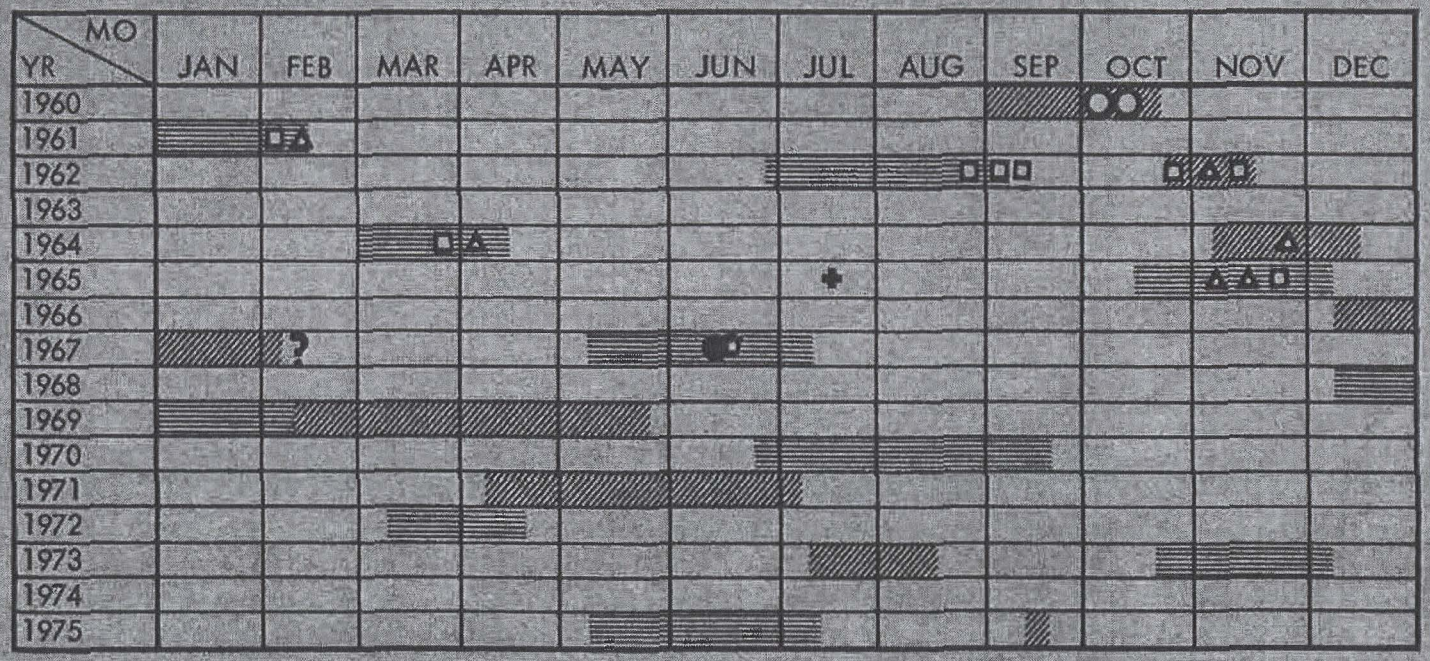
Probable entry
capsule

Soviet Attempts to Probe Venus and Mars vs. Available Launch Windows



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FTD

Legend

○	LAUNCH SYSTEM FAILURE
□	PARKING ORBIT EJECTION FAILURE
△	SPACECRAFT FAILURE
●	MISSION SUCCESS
	MARS LAUNCH WINDOW
	VENUS LAUNCH WINDOW

NOTES:
In a total of 18 known Soviet attempts, 6 Mars and 11 Venus probes have been mission failures, and 1 Venus probe has been a success.
Neither the US nor the USSR has undertaken a probe of any planets but Venus and Mars.

✚ Zond 3 -- a deep-space probe sent into planetary orbit but not aimed at any planet. Photographed other side of Moon and sent video to Earth from various distances.

? The first launch window since 1960 during which the Soviets apparently did not launch probes.