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NORTH AMERICAN AIR DEFENSE COMMAND

# WIR

## WEEKLY INTELLIGENCE REVIEW (U)



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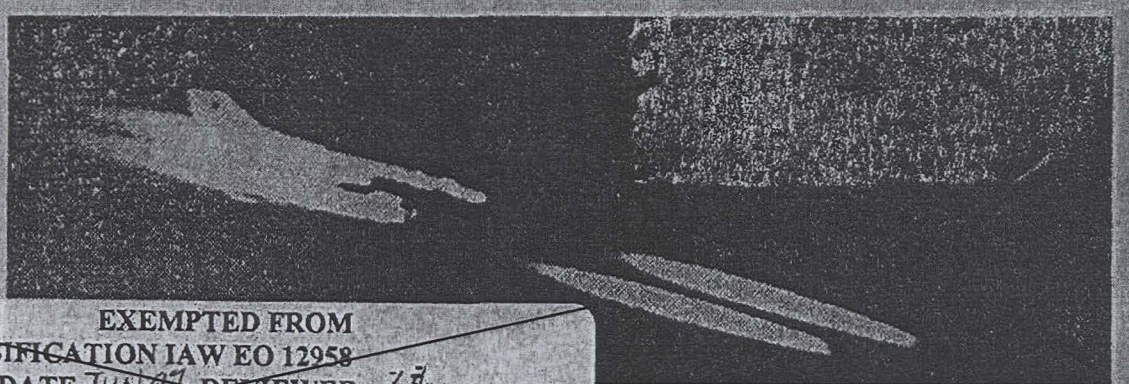



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7 Jan 1966



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# NORAD

## Weekly Intelligence Review

Issue No. 1/66, 7 January 1966



## The WIR in Brief

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Portion identified as non-responsive to the appeal

**Space**



Portion identified as non-responsive to the appeal



COVER: Soviet fighter firing air-to-air missiles (from Red Star) (OFFICIAL USE ONLY)

NOTE: Pages 34, 35, 38 and 39 of this issue are blank.





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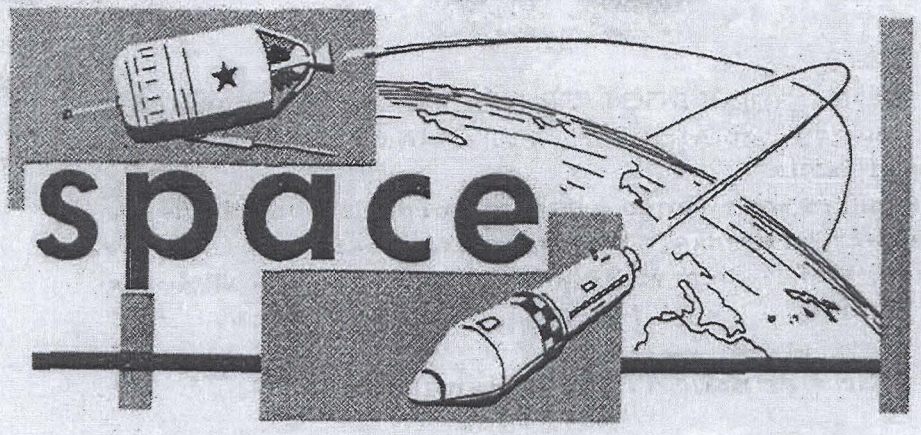


significant intelligence on space developments and trends

## 1965 Soviet Space Year Bigger than Ever

The Soviets in 1965 executed 48 space launches involving 64 payloads in contrast with 30 launches involving 35 payloads in 1964. There was, however, little increase in the diversity of types of launches. Nearly 45% of the launches (nearly 60% of the vehicles involved) are believed to have had primary missions of a military nature.

The quantitative increase in Soviet space activity during 1965, is evident in the chart on page 33.

Chief Soviet accomplishments during the year:

- Man's first space walk.
- The appearance of a new, possibly large space launcher -- the one used in the two Proton launches. Each Proton weighed 12.2 tons (26,896 pounds), according to the Soviets.

The two Venus probes launched in November could also be historic events if next spring, when they near their target, they collect and transmit to Earth important new information about Venus.

On the other side of the ledger, the Soviets:

- Failed in all 6 lunar missions which apparently were intended to soft-land instrumented probes on the Moon.
- Failed to keep pace with the US's stepped-up man-in-space program.

### SPACE EVENTS

Manned Flight. The Soviets launched one manned vehicle in 1965, the 2-man Voskhod. The outstanding feature of this event, which occurred 18-19 March, was the space walk by Cosmonaut Leonov. This was an important step toward the Soviet goal of assembling space stations in

orbit, a technique which apparently is to be used in the Soviet man-on-the-Moon program.

The Voskhod 2 achievement could not, however, dispel the impression that the Soviet man-in-space program has made few gains since the Vostok 3-Vostok 4 flights of 1962. The Soviets are still using essentially the same space vehicle and propulsion system (except for one stage) for their manned flights, and the maximum duration of their manned space flight has increased by only one day -- from 4 days to 5 days. The Soviets have intimated that their cosmonauts have suffered ill effects from weightlessness, despite announcements to the contrary issued during and immediately after manned flights. It is not known whether the Soviets' difficulties stem from poor selection of cosmonauts or from inadequate training.

Other shortcomings of their program:

- The Soviets have not yet maneuvered their manned space vehicles, let alone executed rendezvous.
- The space suit worn by Leonov during his space walk was adequate for the intended mission but would not be as suitable as the US suit for more sophisticated activity in space.

Deep-Space Probes. The Soviets achieved mixed results with their deep-space probes in 1965:

- Two of three attempted probes were successfully launched toward Venus and, according to late-1965 Soviet announcements, are still operating successfully. With their greater payload weights, Venera 2 and Venera 3 have an excellent chance of accomplishing exploratory missions much more sophisticated than those of the US's Mariner 2 (1962-1963). The third attempted Venus probe was injected into a parking orbit but the fourth stage failed to inject it into transfer trajectory toward Venus.
- Zond 3 was launched toward the Moon, after which it went into a highly eccentric planetary orbit of its own around the Sun -- apparently as planned. It transmitted to Earth pictures of the unseen side of the Moon by means of a photo-video system, each frame of which consisted of 1,100 lines, with 860 elements per line. Zond 3 is believed to have been a prototype or test bed for inflight testing of payload systems which would be used on the Venus missions, which were launched four months later. Zond 3 is still transmitting successfully at a distance of more than 50 million miles from the Earth, according to the Soviets -- a distance more than that which will be required of Veneras 2 and 3.

- The Soviets launched 6 lunar probes during the year and all failed in their apparent mission to soft-land an instrumented package on the Moon. Two were propulsion (3d or 4th stage) failures, one missed when the engine used for inflight guidance failed to shut off on command, and three hit the Moon but failed to transmit after landing.

Photoreconnaissance Vehicles. The Soviets launched 17 Cosmos series photoreconnaissance vehicles in 1965, a 42-percent increase over the 12 launched in 1964 (see chart on page 36). All 17 appeared to have been deorbited and recovered successfully. Since the camera systems of these vehicles would occupy only a fraction of the available volume and payload-weight capacity, they could have accomplished a number of other missions, such as infrared (IR) reconnaissance, collection of ELINT and SIGINT, testing of missile-launch detection systems, and collection of scientific data on near-Earth space. Six of those launched in 1965 probably tested IR and ultraviolet (UV) systems for detecting missile launches and missiles in powered flight: the Soviets fired MRBMs from Kapustin Yar when these vehicles were orbiting within line-of-sight of powered-flight path of the missiles.

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The Protons. The Soviets said they used a new, more powerful rocket in the launches of the two Protons which, according to the Soviets, weighed 12.2 metric tons each. [redacted] the launch vehicle was of a new type.

The Proton payloads collected cosmic-ray data in a previously unexplored portion of the energy spectrum. Although the data gained is of scientific importance, the primary mission of the two Proton launches is believed to have been test of the launch vehicle and of the basic payload configuration. The new launch vehicle will probably figure in forthcoming multipassenger manned events.

Scientific Data Collection. The Soviets claimed that all 52 Cosmos-series satellites launched in 1965 were accomplishing scientific research missions. The 7 launched from Kapustin Yar almost certainly had research of near-Earth space as a primary mission, and this might also have been true of 2 launched from Tyuratam (Nos. 58 and 100). The other Cosmoses were military vehicles, prototype or test vehicles, or failures of various types; some of these may have collected some scientific data as a secondary mission. Various non-Cosmos vehicles also collected scientific data on near-Earth space, including the Protons and the Molniya communications satellites.

Curiously, the dual-payload Electron-series launches of 1964 were not repeated in 1965, although all four Electrons long ago ceased transmitting.

Data on cislunar and interplanetary space was collected by the deep-space probes mentioned previously.

Communications Satellites. The Soviets launched two communications satellites in 1965, following one failure each in 1963 and 1964. The two new vehicles were named, oddly enough, the "first Molniya 1" and the "second Molniya 1." Both had apogees of over 21,000 n.m. and orbital periods of about 12 hours, which allowed them to provide about 9-10 hours of communications relay time per day between the easternmost and westernmost parts of the USSR. The Soviets claim to have used these vehicles to relay various types of communications, including both black-and-white and color TV and telephone calls. These vehicles could, of course, be used for military communications within the USSR as well as for the publicized relay of civil communications. The second Molniya was launched on 15 October, shortly after the first one went temporarily silent.

The Multiple-Payload Cosmoses. Five times during 1965 the Soviets launched multiple-payloads with a single launch vehicle from Tyuratam -- 2 launches of 3 payloads each, 3 launches of 5 payloads each. In each case, orbital separation of the payloads was accomplished through restarts of the upper stage of the launch vehicle. All the payloads were given Cosmos designations and were announced as scientific research satellites. Their mission, however, appears to be classified and is, thus, probably military. Possible missions include detection of missile launches and/or random-orbit communications relay, or navigation assistance.

Miscellaneous Launches. Certain Cosmos launches did not fall into any of the preceding categories:

- Cosmos 57 is believed to have been a precursor to the two-man Voskhod, which was launched less than a month later.
- Cosmoses 58 and 100 may have been research vehicles, as announced by the Soviets, but there is a possibility that they were prototypes or tests of weather satellites.
- Cosmos 102's purpose is presently unknown.
- Cosmos 103, which is of unknown purpose, has many of the characteristics of the multiple-payload Cosmoses but consists of only one payload.

## SPACE TECHNOLOGY

Propulsion Systems and Payload Capabilities. The Soviets appear to have made an important gain in payload capabilities with their successful launch of the 12.2-ton Protons, which were nearly twice as heavy as any payloads

previously orbited by the USSR. Design details and the full potential of the new carrier rocket are not known. It appears, however, to be a two-stage vehicle. With a suitable third stage added, it should be able to place into near-Earth orbit a payload of 40,000 pounds, assuming that the Protons weighed the announced 12.2 tons.

Another new and unidentified propulsion system may also have been used in launching Cosmos 102 in late December 1965. Uncharacteristically, [redacted] was received.

The SE-8, introduced and used only once in 1964, was used for 5 launches in 1965. Not a large rocket, its chief feature is the restartability of its upper stage. To date it has been used only to launch multiple payloads from Tyuratam and to inject them into separate orbits. For orbiting modest payloads it should be more economical than the SS-6 ICBM which has been used for most Tyuratam launches.

The Soviets claim that the SCRAG, a 3-stage liquid-propellant missile which appeared in the 9 May and 7 November 1965 parades in Moscow, is capable of orbital bombardment. Its mission and true capabilities are not known to the West because its use has not been identified in any Soviet test firings.

Soviet launch systems proved to be highly reliable during 1965. Only three launches are known to have failed during the year:

- The third (Venik) stage of a probable lunar probe failed on 10 April.
- The third (Lunik) stage of a probable photorecce satellite failed on 13 July.
- An attempt to orbit an unidentified satellite on 16 December failed when an apparent attempt was made to maneuver it as it passed over or near the Kamchatka Peninsula.

The Soviets' previous difficulties with inspace ignition continued into 1965 but were less pronounced.

- The fourth interplanetary stage used with deep-space probes and the Molniyas suffered two failures in the 10 attempts to use it during the year.
- All SE-8 engine restarts appeared to be successful.
- The inflight guidance of one lunar probe failed to shut off on command. (Difficulties with retrofire on lunar soft-landers more likely resulted from mistiming or other problems rather than from mere failure to ignite.)
- Cosmos 57 disintegrated during an apparent attempt to maneuver it.
- Retrofire apparently was successful with all 17 photorecce vehicles but some difficulty was reported for Voskhod 2.

Guidance Accuracy. The Soviets appear to be able to inject payloads into the desired orbits and transfer trajectories within the limits of their propulsion systems. Only in exceptional cases did it appear during 1965 that the desired parameters were not achieved.

Space Tracking. Soviet space tracking still appears to rely chiefly on optical and beacon tracking rather than on radar tracking. Presently, the Soviets can radar-track satellites only with a few developmental ABM radars.

Space Communications. Soviet space vehicles have not been noted in the past for longevity of their communications systems. Some modest improvements were achieved in 1965.

## PROSPECTS FOR 1966

The Soviet space program, though it competes with high-priority military, industrial-growth, agricultural, and consumer-betterment programs for money, manpower, materials, and machine-tool time, will probably expand still more in 1966:

- Satellite photoreconnaissance will probably maintain, if not exceed, the record level of 1965.
- The large propulsion system used for orbiting the Protons will again be used in 1966, possibly for orbiting several cosmonauts in a prototype space laboratory.
- Manned flights involving more extravehicular activity and maneuver attempts should appear.
- Attempts to soft-land instrumented probes on the Moon will probably continue with the same or greater intensity registered in the 6 launches of 1965. Such attempts should be more numerous early and late in the year, rather than in the middle of the year. Their mission would be primarily to learn about the texture and load-bearing characteristics of the lunar surface.
- One or more attempts to launch a Mars probe may occur in late December 1966, when the launch "window" for that planet will begin to open. However, the Soviets might prefer to launch late in the favorable period, in which case launches would be delayed until early 1967.
- Attempts to launch weather satellites should be made, for the Soviets are rapidly becoming remiss in upholding their part of an agreement with the US to launch weather satellites and to exchange information obtained from them.
- Research and utility satellites similar to those launched in the past may also be launched in 1966, as well as some new types of vehicles, such as:

24-hour orbit satellites
Navaid satellites
Geodetic satellites

- The Soviets may conduct tests during the year of fractional-orbit bombardment systems and of high-speed re-entry systems. The latter, though useful for military missile systems, must be developed also for vehicles -- manned or unmanned -- returning from the Moon or its vicinity.

(NORAD; FTD; CIA; DIA)
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## Cosmos 102 a Puzzler

The Soviets launched Cosmos 102 from Tyuratam at about 2225Z, 27 December 1965.

Its orbital parameters,

| | |
|---|---|
| Inclination | 64.95 degrees |
| Period | 89.13 minutes |
| Apogee | 271.6 kilometers (190 n.m.) |
| Perigee | 195.4 kilometers (105 n.m.) |

are very much like those of the average Soviet photoreconnaissance satellite, but there is a distinct difference in timing which would adversely affect the photorecce mission, particularly if the usual Northern Hemisphere coverage is desired. Cosmos 102 was launched 11-12 hours later in the day than the average Soviet photorecce satellite. This means that:

- Perigee occurs over the Southern Hemisphere. ~~[illegible]~~
- Cosmos 102 cannot be recovered in daylight in the normal recovery areas.

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Cosmos 102's mission has not yet been determined, but its activity is being watched with interest and the available data is being studied closely.
(NORAD; Space Defense Center; various ELINT sensors)
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## Cosmos 103 Like Multiple-Payload Events But Consists of Only 1 Payload

The Soviets launched Cosmos 103 from Tyuratam (TT) at about 1230Z, 28 December, into an orbit of the following parameters:

| | |
|---|---|
| Inclination | 56.05 degrees |
| Period | 96.96 minutes |
| Apogee | 640.03 kilometers (340 n.m.) |
| Perigee | 590.06 kilometers (318 n.m.) |

This event was similar in many respects to the multiple payload launches from Tyuratam which occurred 18 August 1964, and 21 February, 15 March, 16 July, 3 September, and 18 September 1965, with this important difference: only one payload appears to be involved in the 28 December event; according to both TASS and the NORAD Space Defense Center. Cosmos 103's propulsion telemetry and orbital inclination are the same as those of the multiple launches and its apogee and perigee are very close to those of the multiple-payload launch of 16 July 1965.

One possibility is that Cosmos 103 is a multiple payload which failed to separate. Arguing against this theory is the fact that TASS announced the event fairly promptly -- within 4 hours after launch -- in contrast with the long delays in announcing payloads which are defective in some important respect.

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(NORAD; Space Defense Center; various ELINT sensors)
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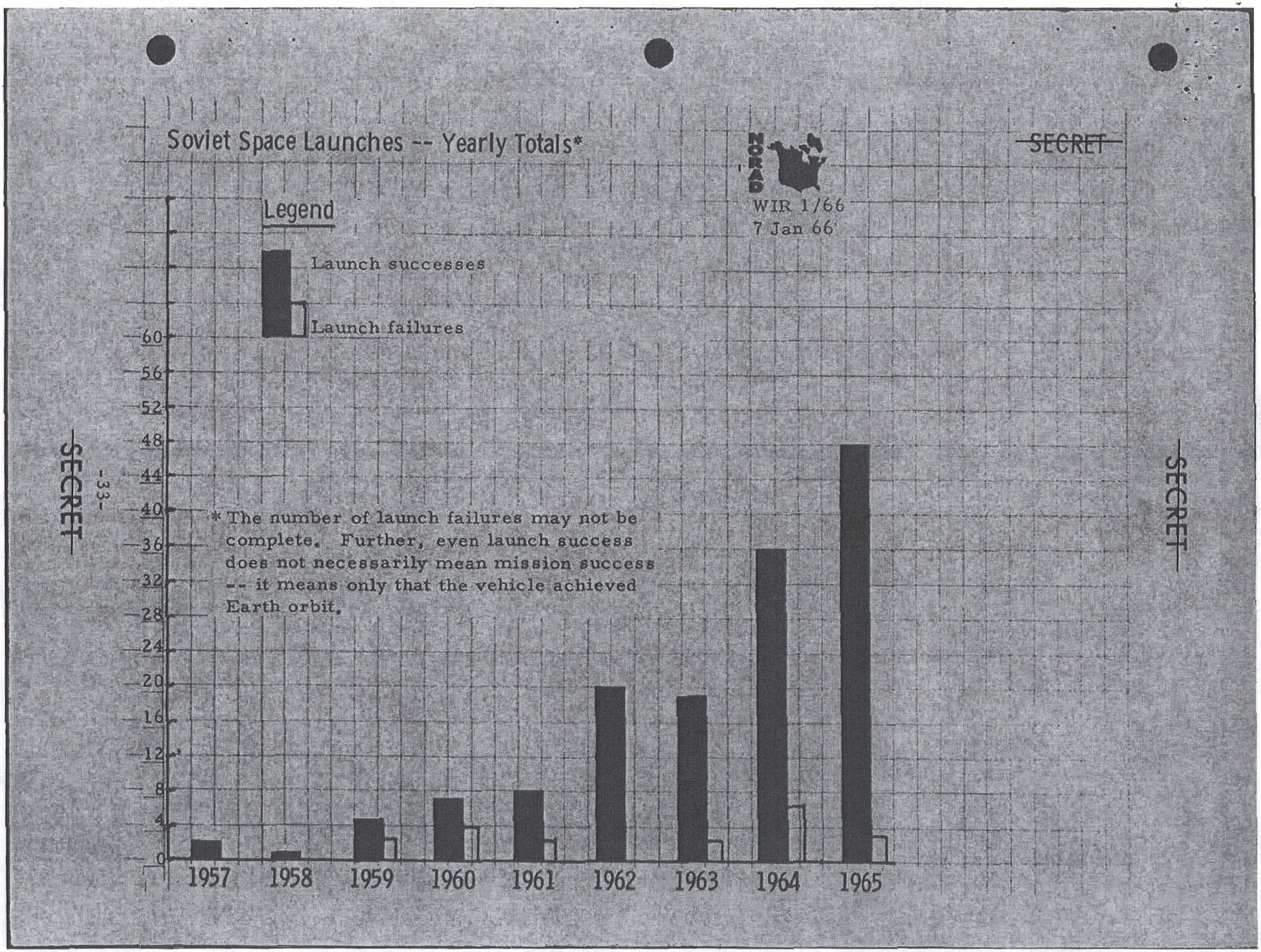
Soviet Space Launches -- Yearly Totals*
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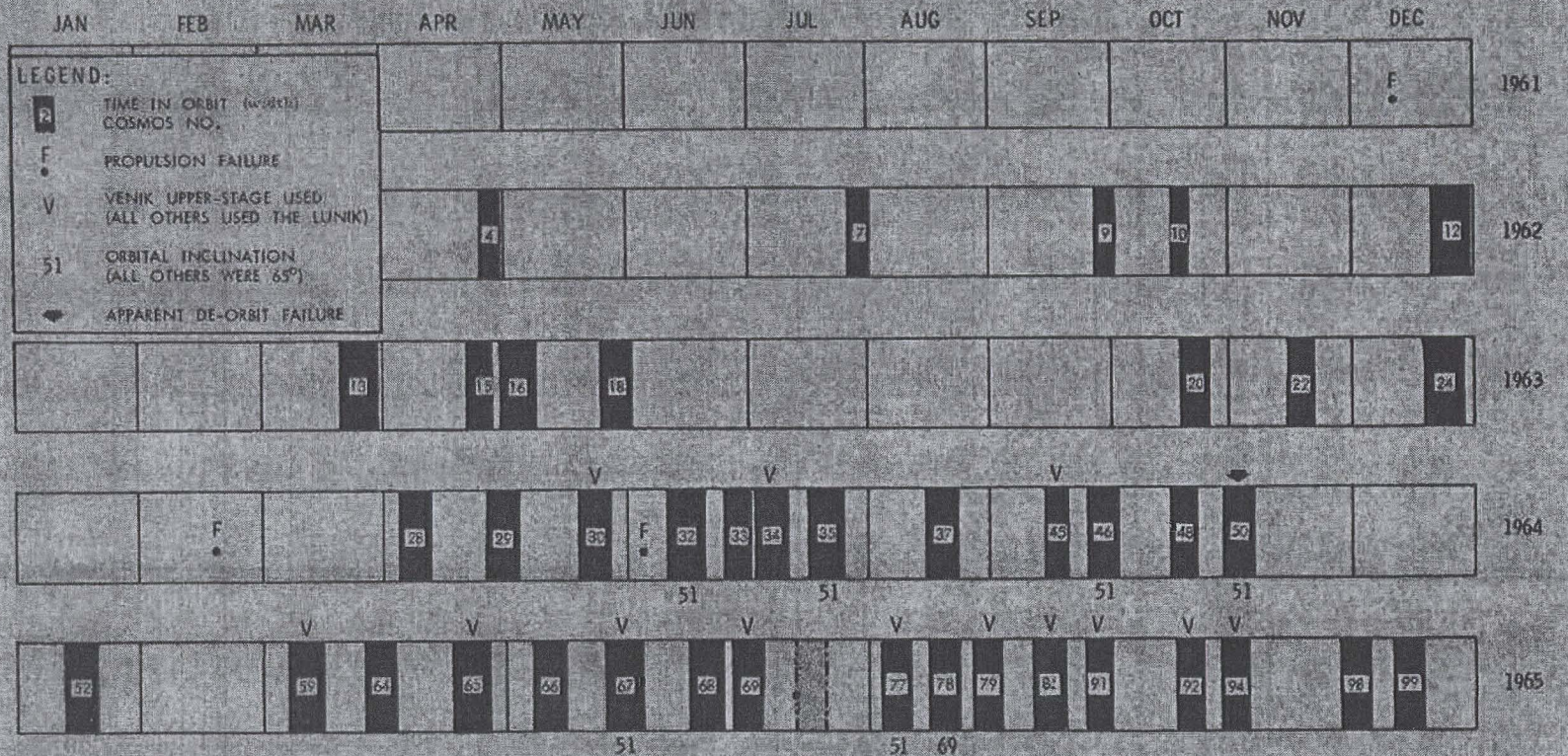
Legend
Launch successes
Launch failures
60
56
52
48
44
40
36
32
28
24
20
16
12
8
4
0
1957
1958
1959
1960
1961
1962
1963
1964
1965
* The number of launch failures may not be complete. Further, even launch success does not necessarily mean mission success -- it means only that the vehicle achieved Earth orbit.

# Soviet Photoreconnaissance Satellites
## (most recoverable Cosmoses launched from Tyuratam)




Soviets claim all Cosmoses are research vehicles but those shown above are believed to have photorecce missions.

1. Launches were timed so that payloads passed over US, southern Canada, and other targets in daylight when payloads were at perigee.
2. Perigees were relatively low.
3. Payloads were stable with reference to the Earth's surface.
4. Payloads were active when passing over areas of potential photorecce interest.
5. In at least one case the vehicle changed attitude before payload activity, following which it returned to original attitude.
6. All vehicles were de-orbited and presumably recovered (allowing film recovery), except for Cosmos 50, which exploded when de-orbit was attempted.
7. Orbits were so low as to be of only limited value for space research.

All were launched by SS-6 ICBM, injected into orbit by upper stage; Lunik-injected payloads weighed about 10,000 lbs, carried camera system of 20-30' resolution. Venik-injected payloads weighed up to about 15,000 lbs, carried camera system of 5-8' resolution. Camera systems would occupy only a fraction of payload weight and volume, so equipment for other missions could be carried. At least 1 apparently collected ELINT. Some believed to have taken part in development of IR and/or UV systems for detecting missile launches. Most 1964 and 1965 missions lasted 8 days. Note infrequency of launches in early days, before system became operational.

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