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NORTH AMERICAN AIR DEFENSE COMMAND

WIR

WEEKLY INTELLIGENCE REVIEW (U)

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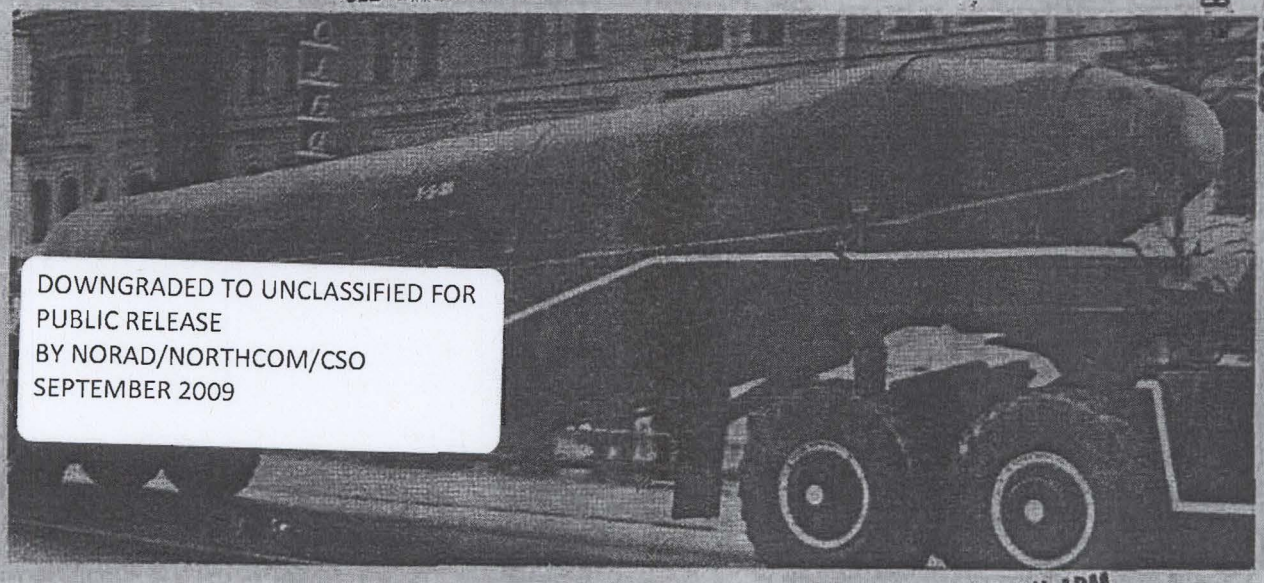

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Issue No. 23/68, 7 June 1968

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The WIR in Brief

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Space

COSMOS 222 IS SECOND RESEARCH SATELLITE LAUNCHED BY SOVIETS IN MAY ~~(S)~~
Launched from Plesetsk.
SPACEBORNE SENSORS TO MEASURE GRAVITY DIRECTLY (U)
In past, done only by precision tracking.
COSMOS 223 BREAKS 42-DAY LULL IN LAUNCH OF SOVIET RECCE SATELLITES ~~(S)~~
Reason for lull not known; Cosmos 224 launched 3 days later.
ATTEMPTED CIRCUMLUNAR LAUNCH WITH EARTH RETURN PUT OFF AGAIN FOR SEVERAL MONTHS ~~(S)~~
Support ship Komarov heads for home from Cuba.

COVER: SAWFLY, reported naval missile (from Aviation Week & Space Technology) (OFFICIAL USE ONLY)

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

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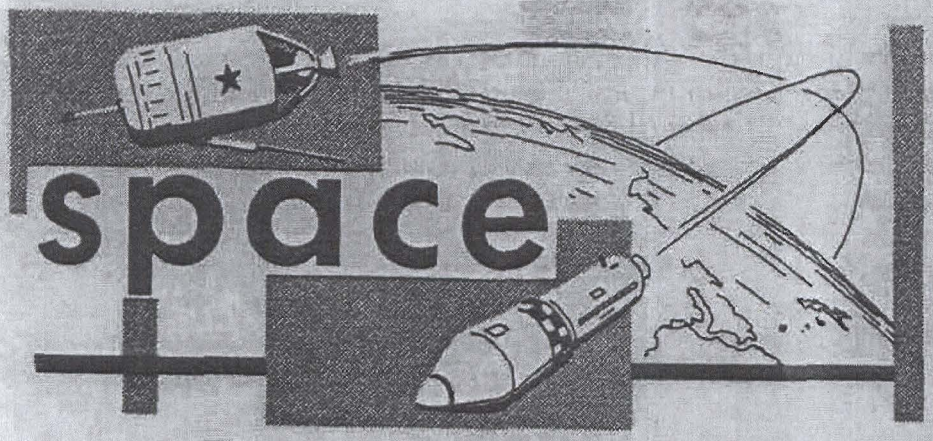

significant intelligence on space developments and trends

Cosmos 222 is Second Research Satellite Launched by Soviets in May ~~(S)~~

Cosmos 222, which the Soviets launched from Plesetsk at about 2030Z, 30 May, is believed to be a research satellite, as announced by the Soviets. It was orbited by the SL-7 propulsion system. Mission of this spacecraft is believed to be geophysical research. Its parameters have been reported as follows:

	By NORAD Space Defense Center	By TASS
Inclination	70.9 degrees	71 degrees
Period	92.3 minutes	92.3 minutes
Apogee	512 km (275 n.m.)	528 km (283 n.m.)
Perigee	296 km (159 n.m.)	277 km (149 n.m.)

This is the second Soviet research satellite launched in May 1968. There have been no Soviet space launches of any other kind during the month. (NORAD)
~~(SECRET)~~

Spaceborne Sensors to Measure Gravity Directly (U)

In using spacecraft to measure gravity, both the US and USSR have, until now, done so only indirectly, that is, by tracking satellites and measuring perturbations in their orbits. Recent Soviet open-source information indicates that the USSR probably intends to make direct gravity measurements from space by installing gravimetric sensors aboard orbiting spacecraft. Direct measurements should be more accurate than indirect measurements.

Three types of instrumentation are being considered by the Soviets: a compensation torsion balance, a residual weight sensor, and a molecular oscillator -- an ammonia maser. (The Soviet satellite Cosmos 97 has

already tested operation of such a maser in space.)

These sensors could probably be carried by almost any of a variety of Soviet spacecraft, but the USSR will probably find it convenient to mount them on their small nonrecoverable research satellites launched from Kapustin Yar or Plesetsk by the SL-7 propulsion system:

- These satellites and their launch system are probably less expensive than other Soviet spacecraft systems.
- It would be worthwhile with such small satellites to devote the entire spacecraft system to gravimetry, thus eliminating interference which might be experienced on a spacecraft which carried equipment for other missions.

Gravimetric satellites would probably be lofted into orbits of high Equatorial inclination, to obtain maximum coverage of the Earth's surface. Plesetsk might be the preferred launch site, for it has already launched SL-7 payloads into orbits with inclinations of about 81 degrees: all the Kapustin Yar launches to date have had inclinations of about 49 degrees.

Gravimetric calculations based on direct measurements have some important advantages in precision over those based on observation of orbital pertubations:

- Direct measurements portray only gravity or gravity-related parameters, whereas ground tracking of satellites must take into account several other perturbative factors, the magnitudes of which are largely unknown (solar-radiation pressure and atmospheric drag, for instance).
- Indirect measurements require very precise tracking data both before and after gravimetric data is taken as well as while it is being taken. For direct measurements, only the altitude, latitude, and longitude of the spacecraft at the moment the data is taken are required.

Data about gravity is needed by geodesists (who try to determine the precise size, shape of the Earth and variations in its gravity field), geologists, oceanographers, and those who would target ICBMs agains comparatively small targets. Gravimeters were originally mounted at ground installations; later, models were developed which could be operated aboard aircraft in flight and ships. Only spaceborne gravimeters, however, would be able to collect the voluminous data needed for precision ICBM targeting.
(FTD; NORAD)

Cosmos 223 Breaks 42-Day Lull in Launch of Soviet Recce Satellites (S)

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A 42-day lull in launches of Soviet military reconnaissance satellites ended on 1 June with the orbiting of Cosmos 223; this was followed 3 days later by the launch of Cosmos 224, another recce satellite. These are, respectively, the 9th and 10th Soviet reconnaissance satellite launches this year.

Cosmos 223 was launched from Plesetsk at about 1100Z, 1 June, Cosmos 224 from Tyuratam at about 0645Z, 4 June. Both were orbited by the SL-4 propulsion system. [redacted] the mission of Cosmos 223 is low-resolution photorecce and ELINT collection, that of Cosmos 224 is high-resolution photorecce.

NORAD Space Defense Center reports their orbital parameters as follows:

	Cosmos 223	Cosmos 224
Inclination	72.9 degrees	52 degrees
Period	89.9 minutes	89.7 minutes
Apogee	336 km (181 n.m.)	270 km (145 n.m.)
Perigee	199 km (106 n.m.)	160 km (86 n.m.)

Cosmos 224's launch time (0645Z) is unusually early in the day for a Soviet recce satellite.

The reason for the 42-day lapse between launches of Cosmos 216 (20 Apr) and Cosmos 223 (1 Jun) is not known. It is the longest period between Soviet recce satellite launches in 3 years; it is in contrast with the fact that the Soviets have been launching these vehicles at the rate of about 2 per month over the past 2.5 years.

Lengthy lulls in other Soviet space programs frequently have either:

- Followed a failure or series of failures, after which a modified vehicle or payload has appeared; or
- Heralded the appearance of a new series of vehicles or payloads, to upgrade the program.

It is possible that neither of these factors explain the 42-day lull. The USSR's recce program has suffered very few failures. There are good reasons for believing that the Soviets may soon inaugurate a new series of recce satellites, but there are no indications that Cosmoses 223 and 224 carried new types of payloads.
(NORAD)
~~(SECRET)~~

Attempted Circumlunar Launch with Earth Return Put Off Again for Several Months (S)

The Soviet space-event support ship Cosmonavt Vladimir Komarov again is on its way home from the Cuban area without having accomplished any visible mission. (Photo on page 35.)

This relatively new ship, loaded with sophisticated communications gear and two large radomes, is believed to have been intended to play a key role in Soviet attempts to send a payload around the Moon and back to Earth for recovery. Its mission probably is to monitor the injection into lunar trajectory and to command and communicate with the lunar craft at times when the latter is not within line of sight of the Soviets' deep-space command and communications centers in the Crimea and Vladivostok.

The Komarov was deployed to Cuba last August and remained in that area until shortly after the 22 November failure of an SL-12 launch. (It has been anticipated that the 4-stage SL-12, the Soviets' largest rocket-propulsion system, will be used to launch a payload around the Moon and back to Earth for recovery; it is expected, too, to play a role in still more advanced stages of the Soviets' lunar exploration program.)

Early this year the Komarov again appeared off Cuba, and on 22 April 1968 an SL-12 launch attempt failed. Subsequent attempts were probably scheduled, for the Komarov remained in Cuban waters, but they now appear to have been canceled. The most recent window for the expected circumlunar launch opened 17 May and closed 21 May.

(NORAD)

~~(SECRET)~~

SSESS (Soviet Space
Event Support Ship)
Kosmonavt Vladimir Komarov
(from Aviation Week &
Space Technology)

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