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NORTH AMERICAN AIR DEFENSE COMMAND

WEEKLY INTELLIGENCE REVIEW (U)

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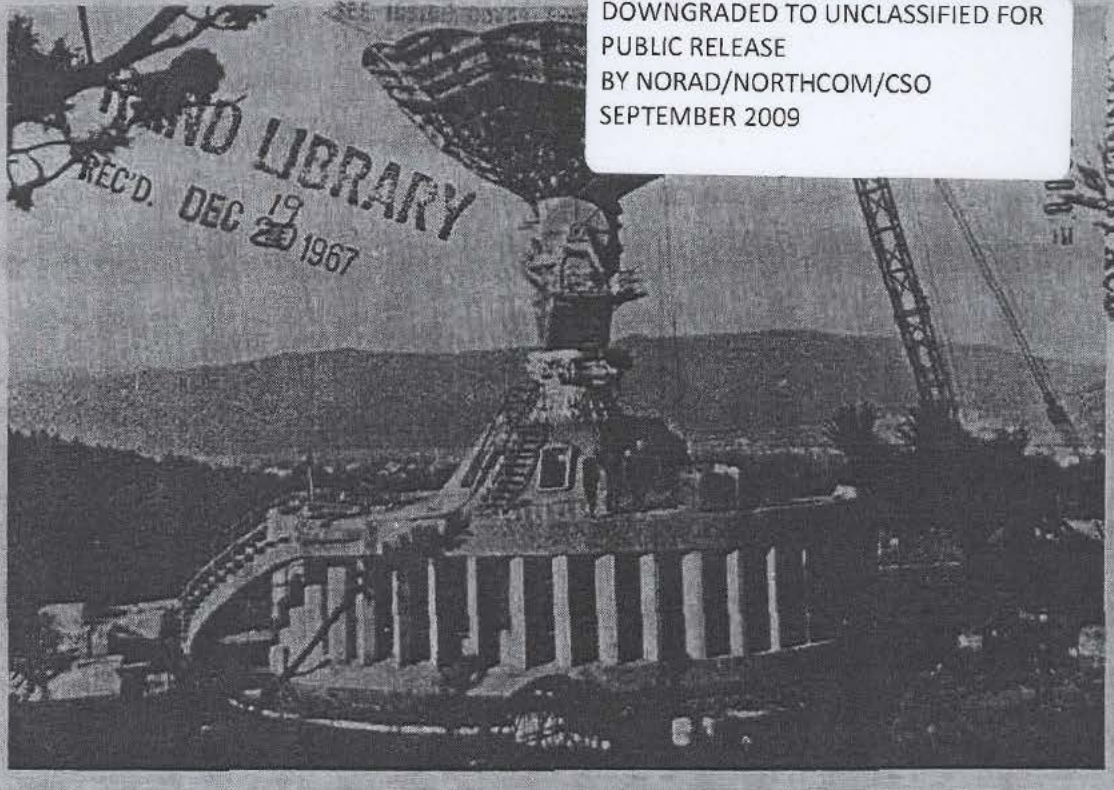

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WIR 50/67
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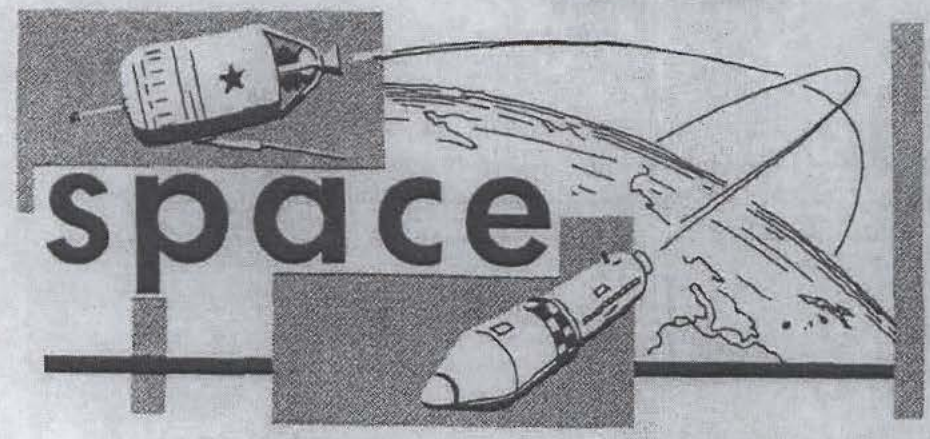
NORAD Weekly Intelligence Review

Issue No. 50/67, 15 December 1967

The WIR in Brief

COVER: Orbita ground receiving station at Chita, USSR (From Aviation Week) (Official Use Only)

NOTE: Pages 30, 31, 34, 35, and 38 of this issue are blank.



space

significant intelligence on space developments and trends

USSR Indignant at US Suspicion That a FOBS is Being Tested

A recent edition of the Moscow News reported and derided the 4 November statement of US Secretary of Defense Robert McNamara "that the USSR was working out plans to use nuclear weapons in space." They accused him of making the statement without any proof and criticized the US and Western European press for rushing the statement into print -- again without producing any sort of proof.

"The only proof," said Moscow News, "was that the USSR had launched a string of Cosmos sputniks. The USSR is most certainly engaged in carrying out large-scale space research. But by what right does McNamara connect this with intentions to use outer space for military purposes?"

The best proof, which cannot be disclosed publicly, of course, is that

Secretary McNamara, though he did not specify them, was referring to 15 launches (3 in a suborbital mode, 12 orbital) between 16 December 1965 and 28 October 1967. The 3 suborbital vehicles were fired toward the ICBM impact area on the Kamchatka Peninsula; the orbital vehicles which functioned properly were de-orbited to a regular missile impact area east of Kapustin Yar. All 15 vehicles were launched from the Tyuratam Missile Test Range by the SS-X-6 system (FOBS), which consists of the 2-stage SS-9 ICBM and a third-stage re-entry vehicle. The Soviets gave Cosmos designations to the 9 orbital launches which succeeded.

Other evidence which supports the theory that these launches involved test of a fractional orbit bombardment system:

- The orbital parameters are those expected of a FOBS, not those of a space-research satellite.
- The timing of these tests (WIR 44/67) follows closely the pattern of missile testing, not the pattern of a series of research satellites.

This is the second Soviet attempt to disguise the purpose of these vehicles. Previously, when the Western press speculated on a number of Soviet Cosmos satellites which were de-orbited upon completion of a single orbit, the Soviets attempted to allay suspicion by planting rumors among Western newsmen in Moscow that the vehicles were testing an improved parachute system for Soyuz-type manned vehicles, in order to avoid a repetition of the Komarov tragedy (WIR 36/67). This alleged mission is most unlikely, since the re-entry angles of the satellites in question were too steep to duplicate realistically the re-entry conditions of the Soyuz-type craft.

The Moscow News article went on to say, "The USSR is party to the treaty on principles governing the activities of states in exploration and use of outer space. This treaty forbids the orbiting of objects with nuclear weapons. The USSR has always scrupulously adhered to its international obligations...."

This Soviet protestation is, of course, irrelevant. Highly realistic tests of a FOB can be executed without actually orbiting a nuclear warhead. The fuzing and arming systems can be tested with inert materials which simulate the weight and volume of the real warhead. And the weapon effects of the nuclear components can be determined in underground tests, of which the Soviets have conducted at least 16 so far this year.

The Soviets, meanwhile, have been trying to determine the source of Secretary McNamara's information (see last item in Space section of last week's WIR).

(Soviet press; NORAD)

~~(SECRET)~~

Cosmos 192 May be Navaid Satellite

Cosmos 192, which the Soviets launched from Plesetsk on 23 November, and two other satellites with similar orbital parameters (Cosmoses 158 and 189, launched 15 May and 30 Oct 67 respectively), are believed to have been intended as navigation aids.

50X1 and 3, E.O.13526

The exact purpose of the transmissions are unknown, but a number of circumstances point to the possibility of a navaid mission for this vehicle:

- The 74-degree orbital inclination is high enough for global aid to the navigation of surface craft.
- The orbit is high enough to avoid atmospheric drag which would change its parameters appreciably.

- The orbit is low enough to minimize range-rate changes.
- 50X1 and 3, E.O.13526
- The presence of two oscillators would add to the probability that the demand for a highly stable oscillator would be met.
- The latest 5-year Plan (1966-1970) calls for a navigation satellite

All three satellites -- Cosmoses 158, 189 and 192 -- were launched from Plesetsk by the SL-8 propulsion system.
(FTD)
~~(SECRET)~~

Weather Data from Cosmos 184 Poor When Received in Washington

The initial weather data received from the Soviets' latest weather satellite, Cosmos 184, was generally poor when received in Washington. This does not necessarily mean that the quality of the picture transmitted by the satellite was poor: degradation could have occurred in the re-transmission from Moscow to Washington, as has happened in the past.

50X1 and 3, E.O.13526

Although Cosmos 184 was launched on 24 October, the first data was not received in Washington until 2 November, and this transmission represented a data "take" of the previous day. The reason for not transmitting before 2 November is not understood, since the West had been [redacted] regularly since the satellite has been launched.

The transmission of 2 November was the Soviets' first intimation that Cosmos 184 was a weather satellite: in announcing the launch 2.5 days after the event, TASS said that it was performing the usual Cosmos mission, that it was carrying scientific instrumentation for space research. The West had anticipated, however, that Cosmos 184 was intended to be a meteorological satellite, because of its orbital parameters. Furthermore, previously launched Soviet weather satellites were no longer operating or were not functioning properly (p. 14, WIR 44/67).
(CIA)
~~(SECRET)~~

Automation May Reduce Cosmonaut's Role Somewhat in Future Soviet Space Program

The Soviets appear to be returning to the conservative, carefully paced approach to manned spaceflight which characterized their Vostok and Voskhod programs. They seemed to have departed from this approach with the launch of Soyuz 1 in April this year after only one

generally successful test flight of the new craft. Also, it appears that the Soviets will rely on automation, not only to increase flight safety, but to make manned flight unnecessary, where possible, and to aid spacecraft pilots by performing as many pilot functions as possible.

This new look is evidenced in Soviet press comment, particularly following the automatic rendezvous/docking operation of Cosmoses 186 and 188 last month. The Moscow press has said that an increased use of robots and automatic equipment will save money, fuel, weight -- and lives. Further, they said, it would be folly to risk a man in space when a robot could do the job just as well.

Man still has a space role, the press said, but he should be committed to spaceflight only after machines have blazed the trail and provided the environment man needs for survival and operating efficiency.

Even before last month's automatic rendezvous/docking, Feoktistov the scientist-cosmonaut who flew in Voskhod 1 in 1964, commented that "crews should have no more controlling tasks, otherwise they would not have time for anything else." His statement could be significant, for he has been involved in the development of Soviet manned spacecraft.

In the first Soviet manned flights, the cosmonaut was little more than a passenger. Later, the Soviets extolled man's usefulness as an experimenter in space and his value in controlling the spacecraft, particularly during emergencies. Voskhod 2, for example, was landed under manual control after the automatic de-orbit sequence failed.

If Feoktistov's statement is authoritative, future Soviet manned flights should see the Soviets retaining their primary reliance on automatic systems, with man controlling the spacecraft only during emergencies or when some mission flexibility is desired. The cosmonaut's primary function would be to accomplish mission tasks, such as experiments, devoting a minimum of attention to pilotage.

(CIA)

~~(SECRET)~~

Portion identified as non-responsive to the appeal

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The SL-12, the Soviets' Largest Known Space Propulsion System

The 4-stage SL-12, the Soviets' largest known space-propulsion system, has a liftoff weight of about 2.24 million pounds and a first-stage thrust of 3 million pounds. It is believed capable of injecting about 50,000 pounds into near-Earth orbit or of sending a payload of 10,000-15,000 pounds into a lunar trajectory in a single launch. (For more on its characteristics, see page 33.)

The SL-12 itself has appeared in 3 space events to date -- all occurring in 1967, but it was preceded by a total of 4 launches in 1965 and 1966 of the first two stages, which Western intelligence has named the SL-9 space-launch system.

The four SL-9 launches occurred at intervals of about 4 months, the first launch taking place in July 1965. The third launch ended in an early inflight failure. In the case of the 3 successful launches, the Soviets announced that their purpose was to orbit 27,000-pound Proton payloads which were to undertake special studies of cosmic rays. These studies undoubtedly were of scientific value, but Western intelligence estimates that the primary mission of these flights was feasibility testing of the components and subsystems of this new, large, second-generation space-booster system. The first stage, it is believed, consisted of a cluster of 6 engines, the second stage a cluster of 4 engines.

An 8-month lull in the program followed the launch of Proton 3, after which the 4-stage SL-12 appeared twice in 28 days, to orbit Cosmos 146 (on 10 March) and Cosmos 154 (on 8 April). The SL-9 made up the first two stages of this launch vehicle. However, the second stage of the SL-9 had been modified significantly.

Although the addition of a third stage had been anticipated, the magnitude of differences between the SL-9 and the SL-12 indicate that the program had probably slipped, possibly due to dissatisfaction with the SL-9.

The Soviets apparently intended to restart the fourth-stage engine of Cosmos 146 and Cosmos 154 after 24 hours in orbit, probably to boost the stage into a higher orbit, perhaps to simulate ejection into lunar trajectory. In the case of Cosmos 146, reignition was accomplished on Orbit 17 and the propulsion system apparently operated successfully for

at least 140 seconds. However, it is suspected that orientation/control difficulties developed: the stage re-entered the atmosphere after the vehicle passed below the radio horizon of the closest Western ELINT site. In the case of Cosmos 154, reignition probably was attempted on Orbits 17 and 33 (a day apart), without success.

The SL-12 appeared next on 22 November 1967, but the event failed when second-stage propulsion was shut down prematurely. The apparent mission of this craft was to send a payload around the Moon and back to Earth for recovery (p. 13, WIR 48/67).

Conventional propellants are employed in all four stages. Storable propellants are probably used in the upper three stages and may also be used in the first stage. The possibility that the first stage oxidizer is cryogenic cannot be ruled out, however.

Prospects. It is believed that the SL-12 has the thrust to send a 10,000-15,000 pound payload into a lunar trajectory without the necessity of a rendezvous-and-docking operation. But the Soviets could intend to execute a rendezvous-and-docking operation in connection with a manned circumlunar flight involving return to Earth for recovery, to avoid the time otherwise spent in man-rating the entire SL-12 system; they could orbit the manned spacecraft with the SL-4, which has been used on 3 manned flights and numerous other space missions, and then effect rendezvous of the payload with the fourth stage of the SL-12. The fourth stage would then ignite, to send the payload into its lunar trajectory. This procedure would require man-rating only of the SL-12s fourth stage.

The SL-12 could also be used to launch manned scientific laboratories or observatories into Earth orbit. If used in such a role, the SL-12 would not necessarily have to be man-rated, since Soviet spacecraft previously man-rated could be used to ferry crewmen to the laboratory/observatory. (CIA)

~~(SECRET)~~

Soviets Plan to Use Molniya-1 Satellites for Broadband Communications

The Soviets are completing installation of a broadband communications system that consists of Molniya-1 communication satellites and a number of "ORBITA" ground receiving terminals. One of these terminals at Chita, in southeastern Siberia, is shown on the cover. The new facility provides service to remote areas of the USSR. The Soviets have repeatedly announced that this system was developed to provide TV broadcast service. With the implementation of multiple access communication satellites in the future, the ORBITA terminals could be made adaptable to the "Soviet Unified Telecommunication System" to serve as a military backup with a minimum of cost and time.

Demands of a modern operational communications system requires multiple access capability. In a multiple access communication satellite system, a number of users may communicate through the satellite at any time. The Soviets have indicated the need for this capability; particularly for their proposed international communication satellite system. The US is employing multiple access capability in the present "INTELSAT" satellite program.

With the addition of a transmitting capability at the "ORBITA" terminals that could operate through the multiple access satellites, the Soviets could make up an independent alternate communications network and have it tie into the "Soviet Unified Communications System". Ground communications to the remote geographical areas, in which most "ORBITA" ground terminals are located, are subject to frequent outages during severe weather. This alternate system would be of particular significance in eliminating or considerably reducing these prolonged outages. This broadband communications system would also be politically, economically and militarily advantageous to the USSR. (For detailed coverage of the ORBITA system see WIR 29/67.)
(FTD)
~~(SECRET~~ NO FOREIGN DISSEMINATION -- Releasable to the US, UK, Canada, Aus, and NZ)

Cosmos 194 Deorbited

Cosmos 194, a Soviet high resolution photoreconnaissance satellite, was deorbitted on 11 December 1967. The vehicle had been launched from the Plesetsk Missile and Space Complex on 3 December. Cosmos 194 was apparently successfully deorbited during the early portion of revolution 125 after crossing the equator at 332 degrees west longtitude at about 0633Z. Impact probably occurred about 20 minutes later in the vicinity of 53-25N - 64-00E.
(NORAD)
~~(SECRET)~~

Cuba/USSR Agree to Set Up a Space Communications System

An agreement has been reached to set up a space communications system between USSR and Cuba, according to the Soviet Press. A satellite is to be used to relay telephone and telegraph messages and television programs. The Soviets will help Cuba build its terminal. No date was given for establishing the system, but the announcement stated that with Soviet experience in this field, it could be done very quickly.
(DIA)
~~(CONFIDENTIAL)~~

technical intelligence NOTES

items of interest
on technical developments
around the world

Soviet Explosive Welding Could be Used for Radiation Shielding

Explosive welding has been extensively studied by the Institute of Hydrodynamics, Siberian Branch, Academy of Science, USSR with the result that a method of explosive cladding has been developed. The method was used on an experimental scale in the production of a 4400 pound three-layer composite from components which could not be jointed by any other method. New effects have been investigated which made it possible to apply explosive welding to material combinations which have been considered unweldable by the conventional explosive welding method. Some of these combinations are lead to copper, lead to titanium, and tungsten to various other metals. The exact application that this development has been used on is unknown; however, a possibility exists that it could be for radiation shielding development.
(FTD)
(UNCLASSIFIED)

Portion identified as non-responsive to the appeal

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Soviets Interested in Fluorine Rocket Fuels

The Soviets have a vigorous fluorine chemistry research program. They have shown an awareness and interest in fluorine and its compounds as propellants and as propellant additives for over twenty years. However,

their use of fluorine or its compounds as propellants is yet to be detected.

The USSR has sufficient raw materials for large-scale production of fluorine and its compounds. The Sverdlovsk and Tomsk areas are suspected of having fluorine production plants and the Soviets are believed to be capable in the handling, transporting and storing of fluorine and its compounds.

The vigorous Soviet fluorine chemistry research program indicates that the USSR will be in the forefront of future fluorine chemical developments and applications leading to the use of fluorine and its compounds as propellants and as propellant additives.

(FTD)

~~(SECRET~~ NO FOREIGN DISSEMINATION -- Releasable to US, UK, Can, Aus, & NZ)

SECRET

-33-

SL-12 Space Booster,
Largest Known Soviet
Propulsion System

Payload	
Weight	12,750 lb ejected from parking orbit
Fourth Stage	
Weight	47,000 lb
Propellant weight	42,000 lb
Thrust	24,400 lb
Third Stage	
Weight	120,500 lb
Propellant weight	110,000 lb
Thrust	149,000 lb
Second Stage	
Weight	440,000 lb
Propellant weight	400,000 lb
Thrust	580,000 lb
First Stage	
Weight	1,620,000 lb
Propellant weight	1,435,000 lb
Thrust	2,950,000 lb (sea level) 3,290,000 lb (Vacuum)

NORAD

WIR 50/67
15 Dec 1967

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