

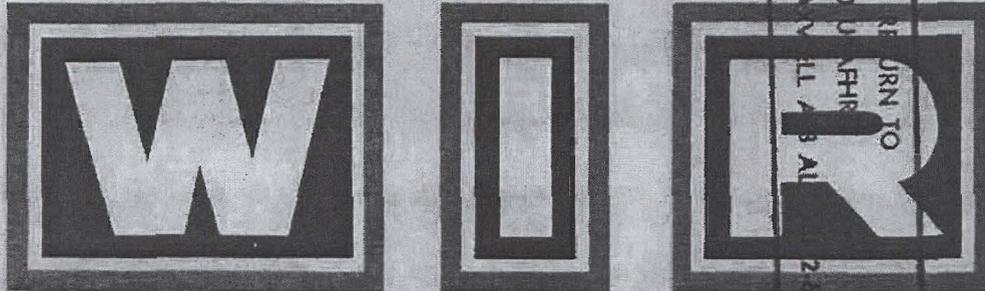


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NORTH AMERICAN AIR DEFENSE COMMAND



WEEKLY INTELLIGENCE REVIEW (U)

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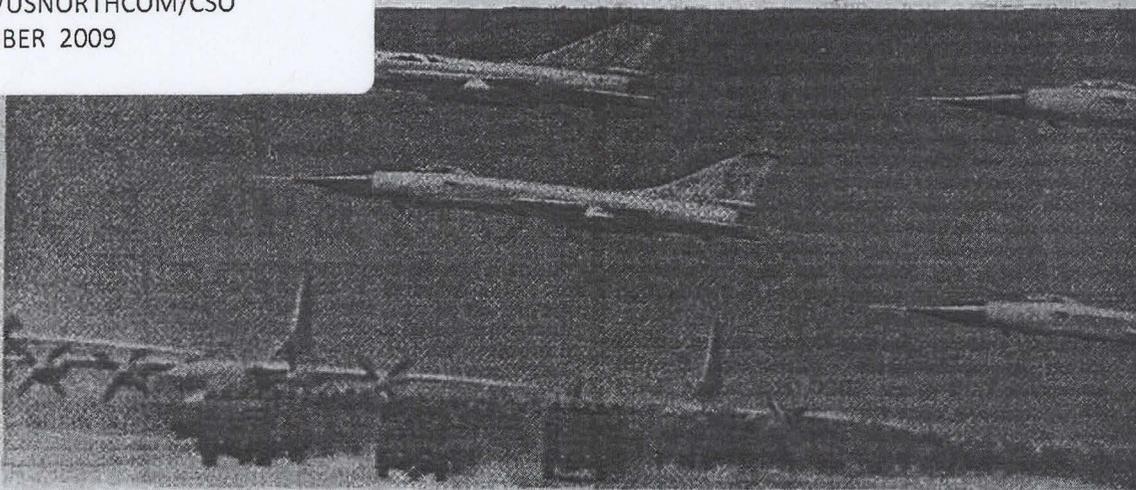
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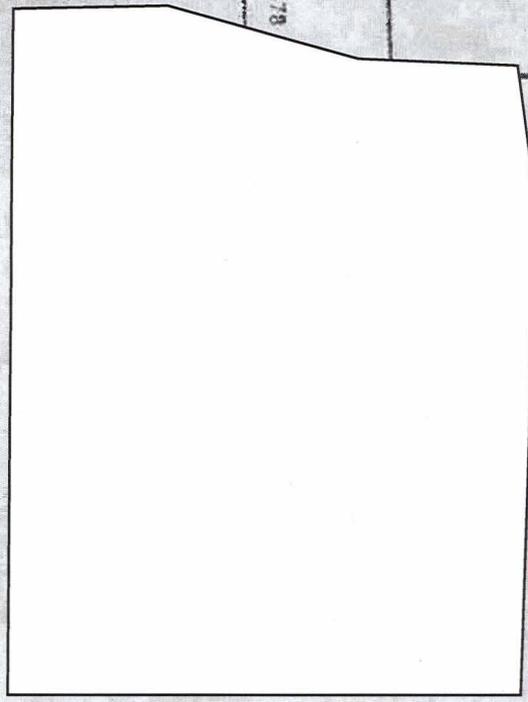
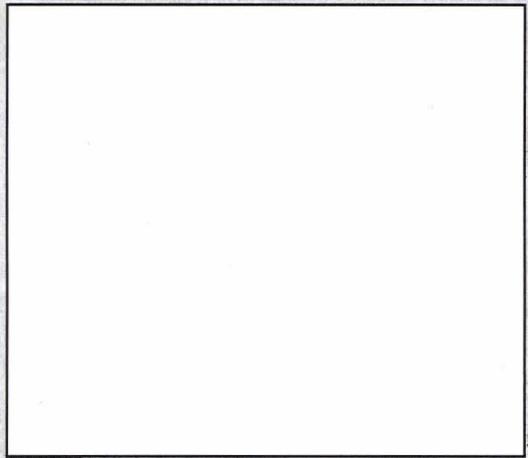
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NORAD

Issue No. 20/68, 17 May 1968

The WIR in Brief



2
2
8
8
10
10
11
12
12
14
15
17

18
21
22
22
23
23
24
25
25
26

50X1 and 3, E.O.13526

Space

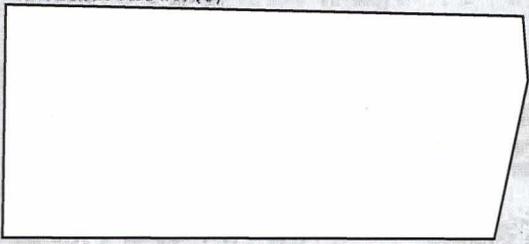
SOYUZ 1 WAS TO RENDEZVOUS AND DOCK, SAYS CZECH NEWSPAPER (U)

About same as Western estimate.

'BO' COMPARTMENT SUITS SOYUZ-CLASS SPACECRAFT FOR SPACE SHUTTLE. SMALL SPACE-STATION ROLES (S)

VENUS 4 MAY HAVE STOPPED TRANSMITTING LONG BEFORE IT REACHED SURFACE OF VENUS (S)

Craft not designed for pressures encountered. ANOTHER VIEW OF SOVIET DEEP-SPACETRACKING ANTENNA SHOWN (U)



COVER: FLAGON fighters (from Soviet press) (OFFICIAL USE ONLY)
NOTE: Pages 28, 29, 32, 33, and 36 of this issue are blank.

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-1-

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significant
intelligence
on space
developments
and trends

Soyuz 1 Was to Rendezvous and Dock, Says Czech Newspaper (U)

The Soviets have never given any pertinent details of the intended mission of Soyuz 1, which carried Cosmonaut Komarov to his death on 24 April 1967. One year after the event, the Czech newspaper Rude Pravo said that "the immediate task of the unsuccessful experiment was the rendezvous and docking of two objects in orbit."

It is not known whether this Czech-published statement is based on information previously supplied confidentially by Soviet sources to certain Czechoslovaks or on speculation which has appeared in the Western press. It coincides closely, however, with Western intelligence estimates.

Western intelligence estimates made shortly after the launch of Soyuz 1 held that the probable mission of the craft was to rendezvous -- but not necessarily to dock -- with another craft to be launched a day or two after Soyuz 1. It was also speculated at the time that one or more cosmonauts might attempt to transfer from one of the craft to the other satellite following the rendezvous. This estimate is still valid, except that it is now believed, in the light of the successful automatic rendezvous and docking of Soviet satellites in October 1967 and April 1968, that Soyuz 1 and its sister vehicle also would have docked, as the Czechs stated.

Supporting this estimate are:

- The fact that Soyuz 1, a multiplace spacecraft, carried only one cosmonaut.
- The unmanned Soviet Cosmos spacecraft which successfully executed rendezvous and docking last October and last April were all Soyuz-type spacecraft [redacted]
- The Russian name "soyuz" means "union," "conjunction," or a "joining."

Rude Pravo also said that Soyuz 1 "tore at high speed into the ground near Kumak village in Adamovka Rayon of Orenburg Oblast, some 500 kilometers northwest of Baykonur. One of the most gifted Soviet cosmonauts

-11-

50X1 and 3, E.O.13526

WIR 20/69 17 May 1968

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met death in the burning debris (unused fuel of the braking engines caught fire)."

(Rude Pravo; NORAD)

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'BO' Compartment Suits Soyuz-Class Spacecraft for Space Shuttle, Small Space-Station Roles (S)

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The Soyuz-class manned spacecraft has two compartments that can be occupied in flight by humans, [redacted] -- the normal re-entry compartment, and a detachable compartment known as the "BO" located between the re-entry module and the inflight instrument compartment aft.

[redacted] Soyuz 1, the craft in which Cosmonaut Komarov was killed last year, [redacted]

Near the end of the flights of Cosmoses 186 and 188 -- unmanned Soyuz-class spacecraft which rendezvoused and docked automatically in space last October -- pressure inside the BO was reduced to zero and then brought back to the previous level observed in orbital flight. This indicates that the compartment can be used as an airlock for cosmonauts who are to perform tasks outside the spacecraft or move to other craft.

50X1 and 3, E.O.13526

[redacted] confirms the validity of the estimated Soyuz spacecraft configuration shown on pages 31 and 34, similar to that of the Soviets' rendezvous vehicles (page 30). The BO is believed to be the cylindrical central portion; after separation of the re-entry module, it is open to the space environment.

The configuration of the Soyuz-class spacecraft plus indications that the BO can be depressurized and repressurized in flight confirms the estimated suitability of the spacecraft as a ferry and resupply vehicle for large space stations, or as a small space station in its own right. In the small space-station role, the BO could be used as a cosmonaut resting/sleeping area, as an airlock for conducting extravehicular activities, and as a hold for storing supplies and experimental equipment for mission tasks.

(CIA)

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Venus 4 May Have Stopped Transmitting Long Before it Reached Surface of Venus (S)

Evidence is growing that the descent capsule of Venus 4, Soviet space probe which sampled the atmosphere of Venus last year, stopped transmitting well before it reached the surface of the planet. If this is true, then any conclusions based on an assumption that the capsule reached the surface of



Venus would be wrong, although the data might be valid for Venusian atmosphere at higher levels.

Indications are that the Soviets, in designing the Venus 4 capsule, were anticipating a thinner atmosphere for Venus than was actually encountered, as a result of which the capsule collapsed and stopped transmitting well above the planet's surface:

- Soviet presentations at the Second Arizona Conference on Planetary atmospheres, March 1968, indicated that Venus 4's pressure and density transducers (sensors which convert pressure into electrical impulses for display purposes) reached saturation points before the probe stopped transmitting.

50X1 and 3, E.O.13526

- A scientist at the conference reportedly learned from the Soviets that the Venus 4 capsule structure was designed for a maximum environmental pressure of 10 Earth's atmospheres and that it collapsed when the pressure reached 20 atmospheres, presumably before the probe reached the surface. This is believable, in view of the fact that the instruments were designed for pressures below 10 atmospheres.
- The Soviets also have said that the capsule's batteries were designed to operate just 100 minutes.
- Signals from the capsule terminated abruptly, a fact which the Soviets found difficult to explain, inasmuch as the capsule was intended to survive landing. It now seems possible that collapse of the capsule, not contact with the surface, caused the cessation.

One Soviet paper at the conference said that the capsule was designed for pressure up to 25 atmospheres. This claim is highly suspect, since the pressure instrumentation was designed for a peak of 7.3 atmospheres. This paper also contradicted early Soviet announcements about the capsule: it said: "... it would have been unreasonable to plan any investigations for the surface," whereas the initial TASS announcement of the Venus 4 descent described in detail the mechanical features that would permit transmission of data from either a solid or liquid surface (p. 12, WIR 46/67).

Finally, there are contradictions between Venus 4 data and the data taken by the US's Mariner 5 one day later as it passed by the planet. The Soviets' data up till now has been given the greater credibility because Venus 4 made direct measurements of the pressure and density of Venus's atmosphere, while Mariner 5's measurements were indirect: Mariner 5 probed



the planet's atmosphere by transmitting to Earth radio signals which passed through the Venusian atmosphere. The burden of the evidence reported above now suggests that more attention be given the contradictions between the Venus 4 and Mariner 5 data.

The Mariner 5 radio signals probed the atmosphere to a considerable depth, yielding a pressure and density profile relative to the center of the planet. Venus 4 made a single radar-altimeter measurement to determine its distance above the planet, and the Soviets have used this as a reference point. It turns out that if the Soviet and US data are to be correlated with each other at all, one must assume that the radius of Venus is 6,080 kilometers (plus or minus 7 kilometers). But US radar measurements from the Earth have indicated that the actual radius is 6,050 kilometers with an error of not more than 1 kilometer. These results are reconcilable only if the Venus 4 capsule radar operated at double the indicated altitude.

If one assumes that Venus 4 did not in fact reach the surface but broke up between 20-30 kilometers above it, the surface temperature would extrapolate to about 450 degrees C, instead of the 280 degrees C. reported by the Soviets, and the pressure would be on the order of 100 Earth atmospheres. A surface temperature of 450 degrees C. would agree well with that measured remotely by Mariner 2, the earlier US Venus probe.

The Venus 4 mission can still be termed at least a partial scientific success, even if it is assumed that the capsule collapsed well above the surface of Venus. It provided some unique data but did not, contrary to Soviet claims, indicate conditions at or near the surface of the planet.

But Soviet scientists, in any event, are now under severe conflicting pressures. On the one hand they are in the midst of a scientific controversy in which the bulk of the evidence appears to be against them. On the other hand, the USSR has claimed that Venus 4 was a great success, having obtained by direct measurement a pressure and density profile of the planet from an altitude of about 20-25 kilometers down to the surface. It is to be expected that the Soviets will stick to their claims and their position for as long as possible.

(CIA)

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Another View of Soviet Deep-Space Tracking Antenna Shown (U)

The photograph on p. 35, taken from the Soviet press (Pravda, 7 May), shows a back view of one end of the Soviets' antenna used for communicating with and tracking Soviet deep-space probes, including interplanetary and lunar craft. A front quarter view of the whole antenna was printed on p. 36, WIR 18/68.

(Pravda)

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crisis; advice to cut down spending have gone unheeded.

No remedies are in sight. As long as everything else remains relatively calm in the Congo, Mobutu may continue to be distracted by the more exciting arena of inter-African affairs and neglect the many difficult, long-term problems that lie ahead at home.

(CIA)

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USSR/BRAZIL

Space Event Support Ship Detained by Brazil ~~(C)~~

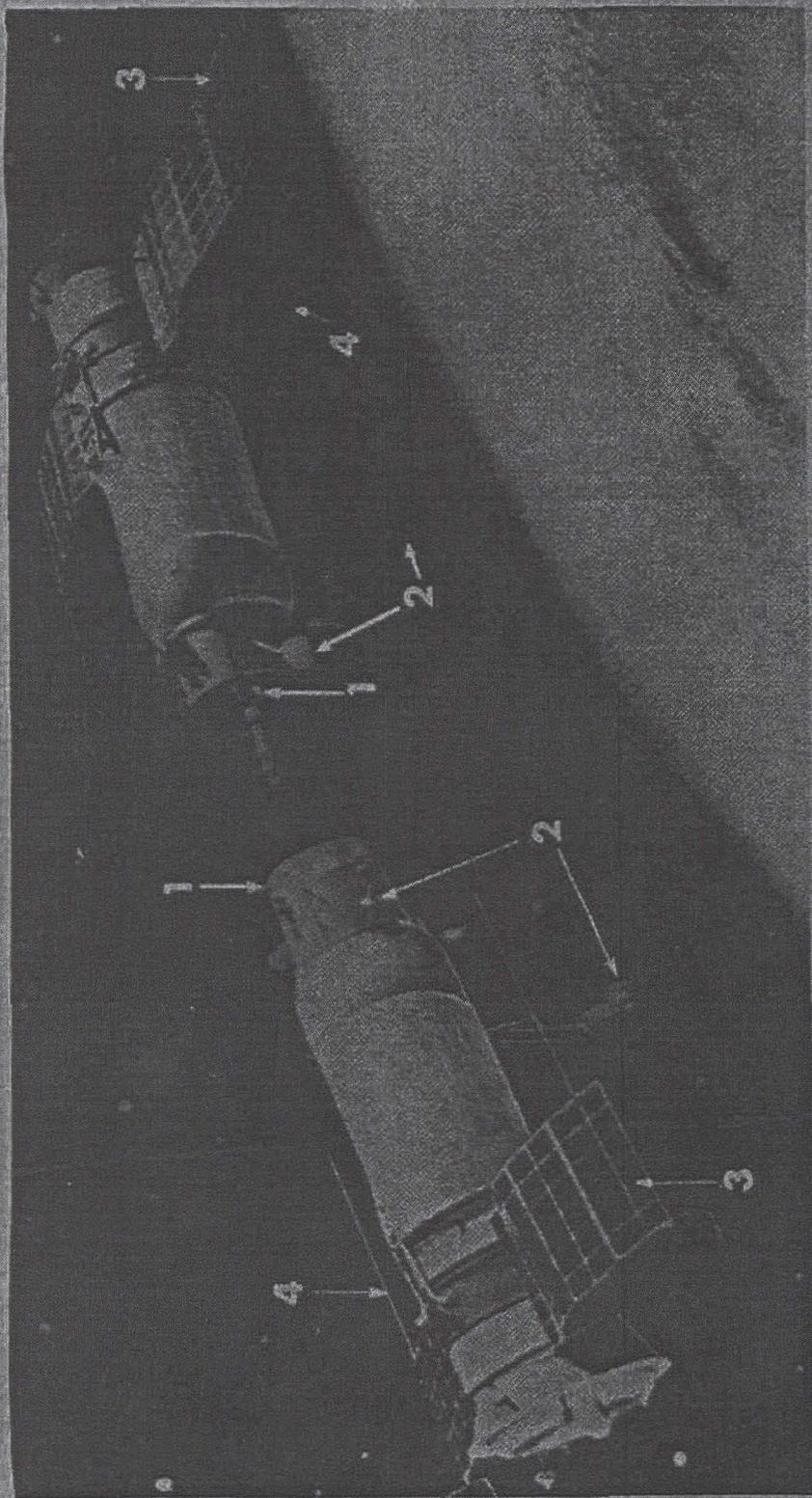
The SSESS (Soviet space-event support ship) Kegostrov has been detained in Santos, Brazil, by order of the Brazilian Navy General Staff pending an inquiry to determine the ship's purpose in operating within Brazilian territorial waters without permission.

The Kegostrov, which declared it was having fresh-water problems, was first sighted on 3 May at anchorage in the vicinity of Itha Alcatraseu by aircraft from the Brazilian carrier Minas Gerais. Shortly thereafter a Brazilian Navy ship was ordered to investigate. This ship escorted Kegostrov into the port of Santos.

(USDAO Brazil)

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Soviets Illustrate Docking of Cosmos Satellites

Models of Cosmos 186 and 188 were used by Soviets to illustrate docking of the unmanned spacecraft in orbit (AW&ST Nov. 6, p. 16). Cosmos 186 (right) was identified as command module for the docking, with Cosmos 188 the passive target. Cited are: (1) docking interface equipment; (2) search and orientation antennas; (3) solar panels; (4) communication antennas.

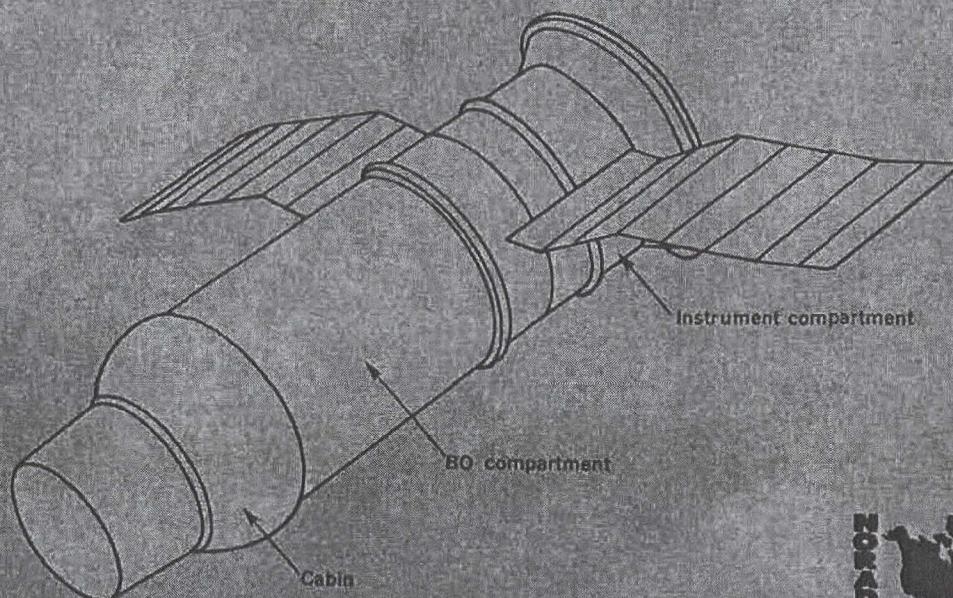
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17 May 68

Docking of Cosmoses 186 & 188
(TASS photo, from Aviation Week &
Space Technology) (U)

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Soyuz-Type Spacecraft in Flight (Estimated Configuration)
(before separation at re-entry) (S)

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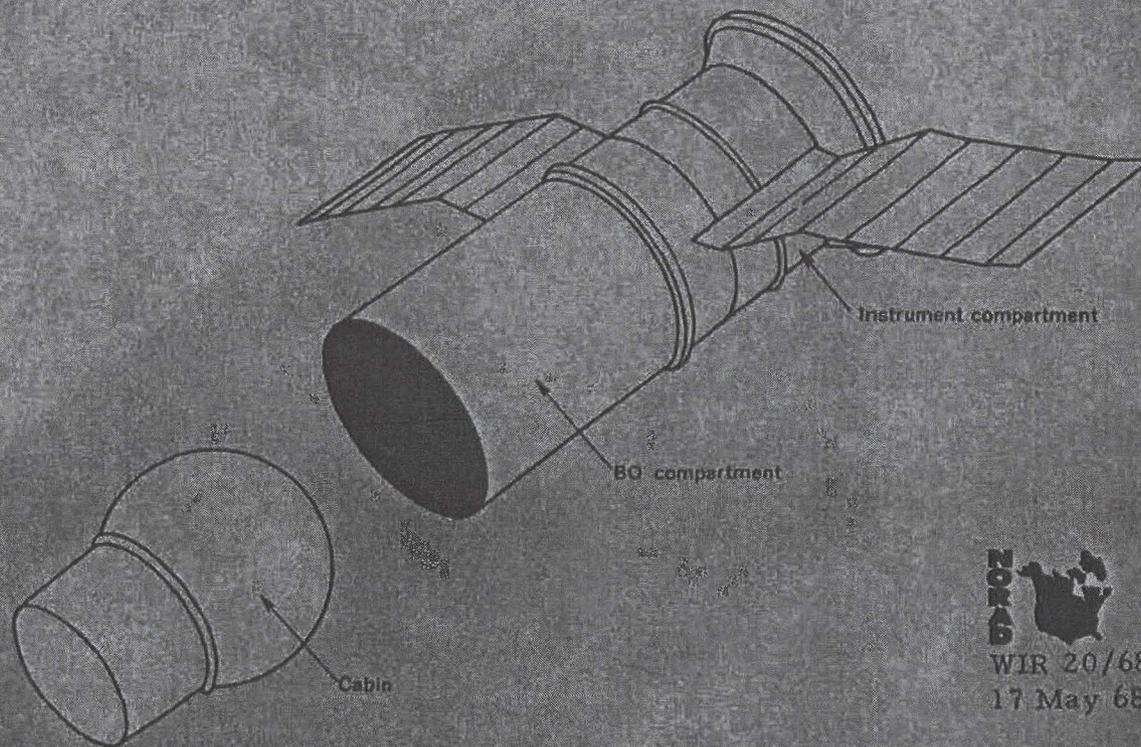
-31-

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WIR 20/68
17 May 68

(Pressurized BO compartment could serve as
cosmonaut rest area, airlock for EVA, storage
space for supplies and equipment)

Soyuz-Type Spacecraft in Flight (Estimated Configuration)
(after separation for re-entry;
BO compartment no longer pressurized) (S)

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WIR 20/68
17 May 68

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-35-

Soviets' Deep-Space
Tracking Antenna
(from Pravda) (U)

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