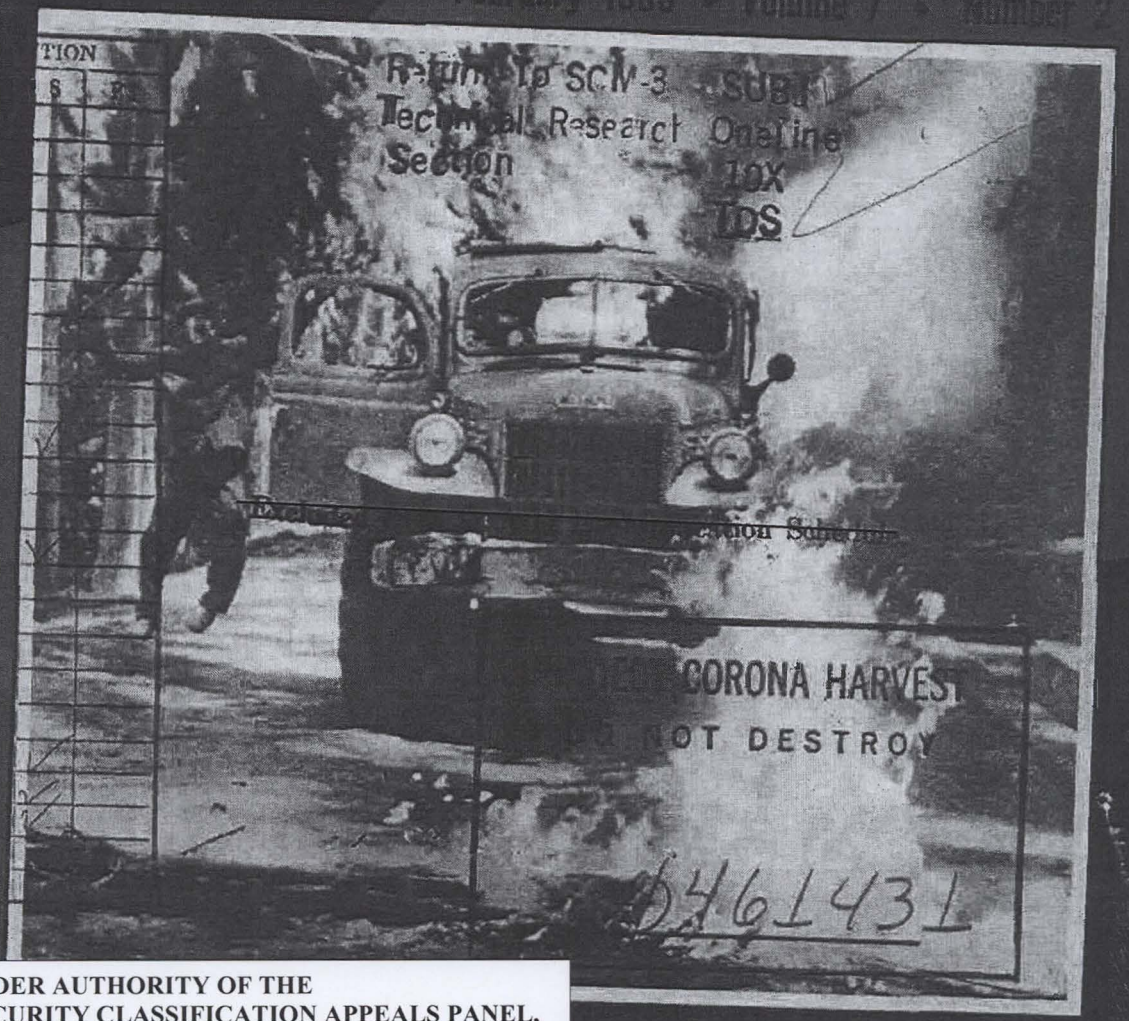
~~SECRET~~

Defense Intelligence DIGEST

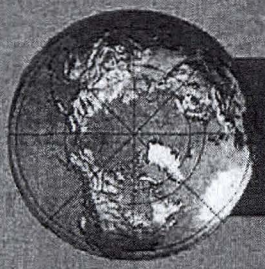
(U)

February 1969 • Volume 7 • Number 2



DEFENSE INTELLIGENCE AGENCY

~~SECRET~~



Contents

ASSOCIATE EDITOR ..... Andrew Pasternak
ART EDITOR ..... Robert L. Barleigh
SR. ILLUSTRATOR ..... Brian W. McMullin
SENIOR EDITORS ..... Francis A. Dohn
Philip McDonnell
D. Edwin Schmelzer
EDITORS ..... Jane R. Hooper
Diana Dee Houston
Susan F. Hirschmann
EDITORIAL ASSISTANTS ..... Mary Mattsson

Fedayeen stage mock raid. For details on this rapidly rising guerrilla force in Jordan, see article beginning on page 12. [U]

CONTENTS

February 1969 • Volume 7 • Number 2

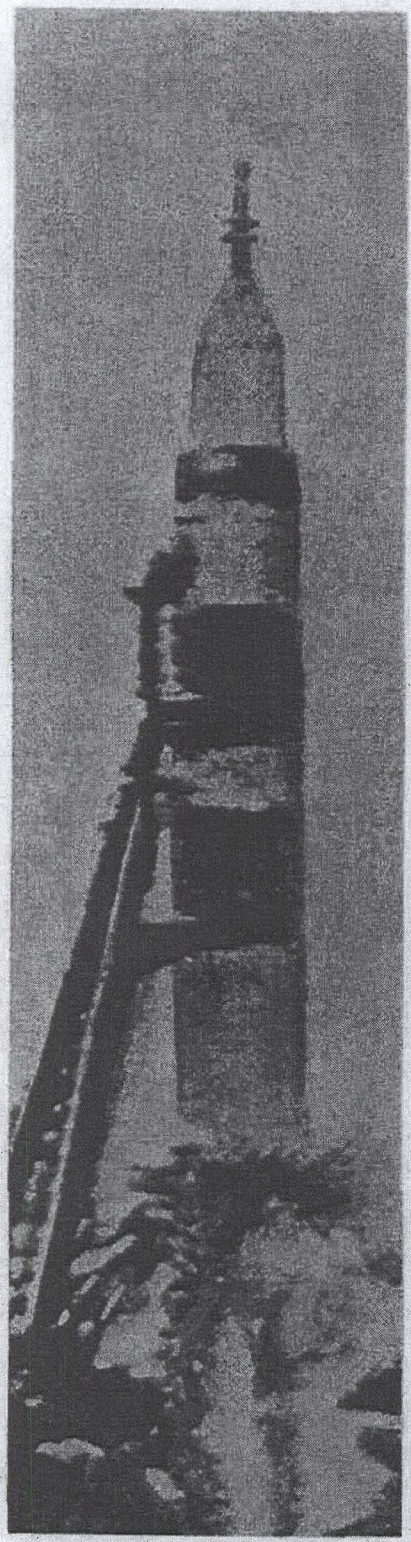
FOREWORD

MISSION: The mission of the monthly *Defense Intelligence Digest* is to provide all components of the Department of Defense and other United States agencies with timely intelligence of wide professional interest on significant developments and trends in the military capabilities and vulnerabilities of foreign nations. Emphasis is placed primarily on nations and forces within the Communist World.

WARNING: This publication is classified secret because it reflects intelligence collection efforts of the United States, and contains information affecting the national defense of the United States within the meaning of the Espionage Laws, Title 18 U.S.C., Section 793 and Section 794. Its transmission or the revelation of its contents in any manner to an unauthorized person is prohibited by law. Although the publication is marked "No Foreign Dissemination," certain articles are releasable to foreign governments; however, such release is controlled by the Defense Intelligence Agency.

Joseph F. Carroll

JOSEPH F. CARROLL
Lt General, USAF
Director



Soyuz 2, 3 Herald

With the successive launchings from Tyuratam of the unmanned Soyuz 2 and the manned Soyuz 3 recoverable vehicles, on 25 and 26 October 1968, the Soviet Union marked the end of an ostensible 18-month layoff in manned space activities.

Some of the circumstances attending the events were unusual. On 28 October, after the two spacecraft had apparently failed in attempted docking exercises, Soyuz 2 was successfully returned to earth and recovered—reentry being accomplished during the 48th orbit—but Soyuz 3 continued on course until 30 October, despite an announcement by the Soviets on 27 October that the ship had "completed the full medical experiments."

Meanwhile, hints in the Soviet press seemed to suggest that another manned spaceship might be launched to rendezvous and possibly dock with Soyuz 3. But after four days (64 orbits), 47-year-old Colonel Georgiy Beregovoy—veteran test pilot and oldest man to have flown in space—landed Soyuz 3 safely by "a combination of systems"—on the steppes of Kazakhstan.

In these launchings, the unmanned vehicle was sent off first, a reversal of the traditional Soviet launch sequence—as applied to previous rendezvous and docking missions—in which the active vehicle always achieved the initial orbit. As an added point of interest, the launching of Soyuz 2 was not announced until after Soyuz 3 was aloft and in orbit.

Major goals achieved

From the evidence the following facts emerge:

- A space rendezvous between a manned vehicle and an unmanned target was attempted for the first time by the Soviets.

Soyuz vehicle (left) that carried Col Georgiy T. Beregovoy (right) into space for a rendezvous with the Soyuz 2 [U]

Soviet Re-entry Into Space Race

• The landing procedure was hailed by the Soviets as a unique demonstration of a new, highly accurate method that combines a controlled aerodynamic lift or ballistic re-entry system—afforded by a module designed expressly for that purpose—with the standard soft-landing system provided by low-altitude retrorockets and parachutes.

Late-type vehicle

Soyuz 3, an advanced Soviet spacecraft capable of carrying a crew of three and designed for docking, is a tri-compartmented configuration comprising an orbital section, a re-entry vehicle, and a service module. Living space—including the interconnected orbital compartment and the re-entry vehicle—is larger than previous Vostok/Voskhod, providing a shirt-sleeve environment of about 320 cubic feet.

The orbital compartment—a feature of the Soyuz spacecraft—can be pressurized and depressurized while in orbit. It serves both as a laboratory for conducting scientific research and as a rest area. Cosmonaut A. S. Feoktistov (Voskhod I) has described the compartment as containing—in addition to the specialized scientific apparatus—some of the guidance, control, and communications paraphernalia and a portable television camera. The cabin's four portholes are also used for scientific observation.

The service module includes the basic "housekeeping" equipment for operating the spacecraft systems during the orbital phase, and also the large, secondary, liquid-fueled engines used in maneuvering. Small attitude-control engines are mounted on the exterior.

Soyuz employs the SL-4 launch system (the SS-6 booster and the Venik third stage), which can lift up to 15,000 pounds into orbit. It is the first manned spacecraft in which the Soviets have made use of a weight-saving solar panel in place of batteries as a primary energy source, indicative of a future role in a long-duration flight.

SOVIET MANNED SPACE FLIGHTS

Flight	Date	Pilot	Duration	Capsule Weight	Achievements
Vostok I	12 Apr 61	Col Y. A. Gagarin	1 hr 48 min	10,425 lb	First man in orbit.
Vostok II	6 Aug 61	Maj G. S. Titov	25 hr 18 min	10,432 lb	Extensive testing of man's performance under weightlessness, including control of capsule.
Vostok III	11 Aug 62	Maj A. G. Nikolayev	94 hr 22 min	10,364 lb	Near pass of two vehicles (about 3.5 nm);
Vostok IV	12 Aug 62	LTC P. R. Popovich	70 hr 57 min	10,364 lb	scientific data on prolonged weightlessness; simultaneous tracking and control of two vehicles; extensive experimentation with manual control.
Vostok V	14 Jun 63	LTC V. F. Bykovskiy	119 hr 6 min	10,412 lb	First woman in space; first nonpilot in space;
Vostok VI	16 Jun 63	Jr Lt V. V. Tereshkova	70 hr 50 min	10,425 lb	comparison of male and female reaction to space; capsule-to-capsule communication.
Voskhod I	12 Oct 64	Col V. M. Komarov Crew: K. Feoktistov Dr. B. B. Yegerov	24 hr 17 min	12,000 lb (approx)	First multimanned flight; first scientific personnel in orbit.
Voskhod II	18 Mar 65	Col P. Belyaev LTC A. Leonov	26 hr 2 min	12,000 lb (approx)	Leonov first man to leave capsule in space.
Soyuz I	22 Apr 67	Col V. M. Komarov	26 hr 40 min	15,000 lb (approx)	First manned trial of Soyuz spacecraft; mission plagued with problems, causing termination after only one day in orbit; capsule parachute system failed, killing pilot.
Soyuz III	26 Oct 68	Col G. Beregovoy	94 hr 51 min	15,000 lb (approx)	Requalification of Soyuz spacecraft for manned flights; first Soviet rendezvous involving a manned spacecraft; attempt at docking apparently failed.

EDITOR'S NOTE: As this issue went to press in January, the Soviet Union launched Soyuz 4 (one cosmonaut onboard) and Soyuz 5 (three cosmonauts). The spacecraft docked on the 34th and 18th orbit, respectively. Later, two cosmonauts from Soyuz 5 transferred to Soyuz 4.

TASS-ANNOUNCED PARAMETERS

	Initial		After Maneuvers	
	Soyuz 2	Soyuz 3	Both Vehicles on 27 October	Both Vehicles on Revolution 36
Apogee (nm)	121	122	135	132
Perigee (nm)	100	111	97	107
Period (min)	89	89	89	89
Inclination (deg)	52	52	52	52 [U]

An evolving series

Tests of new or improved instrumentation for Soyuz-type spacecraft have been continuing since April 1967, but not until October 1968 were they accomplished in the manned vehicle. The launching of Cosmos 186 and 188 in October 1967 and of Cosmos 212 and 213 in April 1968 allowed the Soviets to perform automatic rendezvous-docking operations. Cosmos 238, launched on 28 August 1968, was a further test of the maneuvering and deorbiting systems of an unmanned Soyuz.

The flights of those five vehicles proved that the spacecraft was capable of automatic rendezvousing and docking, and the prognosis at that time was that the Soviet Union would eventually repeat a manned flight for those purposes. In fact, transmissions [redacted] during the flight of Cosmos 238 seemed to mark that mission as a probable rehearsal for the manned Soyuz 3.

Success foreseen

The Soviets apparently never questioned the reliability and safety of Soyuz 3 during its four-day orbit and its subsequent re-entry and recovery. In this regard, several live television transmissions from Soyuz 3 were made public, perhaps to demonstrate Soviet confidence in the success of the mission. The pilot, who remained in good health and comfortable throughout the flight, apparently accomplished a full program of spacecraft system tests, including intraplane maneuvers, numerous scientific observations of the earth and stars, astronavigational technique checks, and studies of ocular perceptions under space conditions.

The combined results of the Soyuz 2–3 flights may be considered a cautious, nonspectacular confidence test of a redesigned spacecraft—an analysis given added validity by the atmosphere prevailing during the post-flight press conference. The Soviets at that point seemed to be unusually informative regarding details of the venture, possibly because the accomplishments of the Soyuz flight appeared relatively insignificant in contrast with the spectacular Apollo mission, which had been concluded just four days prior to the Soviet manned launch.

Despite the apparent Soviet cooperation at the press briefing, however, there were some discrepencies in the reporting. For example, the pilot said that hard docking had not been planned, but a Pravda article earlier in the week had stated that the purpose of the mission was "to perfect docking techniques in orbit." Nevertheless, twice during the mission Beregovoy guided Soyuz 3 to within a few meters of the unmanned Soyuz 2. In one maneuver he used manual controls, and in the other an automatic system.

Lunar connotations

Although some Soviet scientists—including M. V. Keldysh, President of the Soviet Academy of Science—and Cosmonaut Beregovoy have stated that the Soyuz is an orbital craft that could not be used for lunar trips, a Soyuz-type craft might possibly undertake a manned circumlunar flight. One of the more likely steps in the Soviet earth-orbital program, however, would appear to be a prolonged manned flight of up to 30 days. It might include rendezvous, docking, and transfer activities either prior to or as a part of a Soyuz-type orbital space-station mission. Finally, a Soyuz-type vehicle could probably serve as a ferry or rescue craft in connection with later, large, long-duration space stations. Although Soyuz does not appear to be designed for these functions, this goal has been mentioned repeatedly by authoritative Soviet spokesmen. [END]

NEAR-EARTH SOYUZ-TYPE SPACECRAFT*

Soviet Designation	Launch Date	Significant Comments
Cosmos 133	28 Nov 66	First launch of Soyuz-type spacecraft.
Cosmos 140	7 Feb 67	Successful.
Soyuz-1	23 Apr 67	First manned Soyuz flight; Cosmonaut Komarov killed during re-entry when parachute system failed.
Cosmos 186	27 Oct 67	First unmanned automatic rendezvous and rigid docking maneuver.
Cosmos 188	30 Oct 67	
Cosmos 212	14 Apr 68	Repeat of Cosmos 186/188 mission; longest Soyuz-type flight.
Cosmos 213	15 Apr 68	
Cosmos 238	28 Aug 68	Maneuvering and deorbiting system tests of passive-type (Cosmos 188 and 213) Soyuz.
Soyuz-2	25 Oct 68	Target vehicle for Soyuz-3.
Soyuz-3	26 Oct 68	Second manned Soyuz flight.

*The Soyuz capsule is an advanced Soviet spacecraft apparently designed to carry three men. It can perform minor orbital adjustments.