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### THE COVER

COMMUNIST photograph of Viet Cong (VC) lying in wait is indicative of the type of warfare waged by the VC. During the 5-month summer monsoon of 1965, the VC made some significant territorial gains and inflicted heavy casualties on the forces of the Republic of Vietnam. Apparently the VC gave top priority to the central and southern highlands and to the area north and northeast of Saigon. But the VC failed to achieve their main objec-

tives—expansion, consolidation, and linkup of the Viet Cong-controlled base areas. During this wet season, multibattalion-size attacks were launched against isolated South Vietnamese strongpoints and a number of provincial and district towns. In addition, lines of communication were subjected to ambush tactics, and numerous harassing attacks were carried out against settlements. For additional information see "Viet Cong Actions in Summer 1965 Aimed at Major Victories," page 4.

### 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.

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*Joseph F. Carroll*

JOSEPH F. CARROLL  
 Lt General, USAF  
 Director

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# USSR COSMONAUT TRAINING: BRIEF SURVEY OF PROGRAM

Four training facilities have been identified in the Moscow area where potential cosmonauts undergo training for periods up to 6 years; supplemental courses may be given after flight

COSMONAUT training in the Soviet Union apparently is flexible, and capable of systematic expansion. Soviet successes in their manned space program attest to the adequacy of cosmonaut training, but available evidence suggests that they still lag in some aspects, notably vestibular training.

This Soviet training evidently begins with the selection of candidates by two medical boards, which probably examine some 400 to 600 pilots for each training group. The pilots—as a result of numerous physical and mental examinations—finally are reduced to a training group of 20 to 30 candidates. Of this number, probably only one-half are graduated by the cosmonaut training school.

The length of time spent in the selection and training of Soviet cosmonauts is not known, but estimates indicate that this period may vary from 17 months to 6 years. Cosmonaut Aleksey Leonov, at a Moscow press conference, on 26 March 1965, outlined his extra year of training, between April 1964 and March 1965, and stated, "I would like to add that this training was preceded by my 5-year training in the cosmonaut training center." The complete cosmonaut training program probably is divided into three phases: the main training program, training for a specific mission, and training at the launch base.

Only a few cosmonauts are trained for a specific mission. In the first

phase, not less than four cosmonauts were at the launching base at mission time. There, the preflight course involved a 2-week study of the spaceship cabin on the launching pad. Cosmonauts who are to fly the mission, and their alternates, are selected from the group in training at the cosmodrome by a special commission.

## Special missions

There is evidence that candidates are chosen and specially trained for specific assignments. Recent press releases describe a lengthy and special training program that Cosmonaut Leonov followed in preparation for his extravehicular emergence and subsequent activity as a crew member of Voskhod II. Apparently the selection of cosmonauts for a specific flight is made long before the actual event and all training is directed toward its accomplishment and familiarization with the overall program. The program for Leonov's mission (including his walk in space), for example, consisted of extensive training both on the ground and in an airborne simulator. The ground training was accomplished in thermal, altitude, and isolation chambers. This apparently was to familiarize the cosmonaut with the problems involved in performing his duties in a pressurized space suit and to expose him to temperatures that could be anticipated during extravehicular activity. In-flight training was conducted in an airborne simulator and consisted in establishing



the proper procedure for exit and re-entry into the airlock of the orbiting Voskhod II under weightless conditions. This latter procedure was repeated until it became an automatic action. Soviet scientists appear capable of augmenting the more general



SOVIET cosmonauts (standing l to r): Valeri Bykovskiy, Gherman Titov, Yuri Gagarin, Andrian Nikolayev, and Pavel Popovich,

### SOVIET MANNED SPACE FLIGHTS

<u>FLIGHT</u>	<u>DATE</u>	<u>PILOT</u>	<u>DURATION</u>	<u>CAPSULE WEIGHT</u>	<u>ACHIEVEMENT</u>
Vostok I	12 Apr 61	Yuri A. Gagarin	1 hr 48 min	10,395 lb	First man in orbit.
Vostok II	6 Aug 61	G. S. Titov	25 hr 18 min	10,408 lb	Extensive testing of man's performance under weightlessness, including control of capsule.
Vostok III	11 Aug 62	A. G. Nikolayev	94 hr 22 min	10,412 lb	Proved ability to accomplish a near pass of two vehicles. Scientific data on prolonged weightlessness. Simultaneous tracking and control of two vehicles. Extensive experimentation with manual control.
Vostok IV	12 Aug 62	P. R. Popovich	70 hr 37 min	10,425 lb	
Vostok V	14 Jun 63	V. E. Bykovskiy	119 hr 6 min	10,340 lb	First woman in space. First nonpilot in space. Capsule-to-capsule communications.
Vostok VI	16 Jun 63	V. V. Tereshkova	70 hr 50 min	10,380 lb	
Voshkod I	12 Oct 64	V. M. Komarov Crew: K. Tokunostov (scientific), Dr. B. B. Yegorov (medical).	24 hr 17 min	11,730 lb	First multimanned flight. First scientific personnel in orbit.
Voshkod II	18 Mar 65	Pavel Belyaev Aleksy Leonov	26 hr 2 min	12,000 lb (approx.)	First extravehicular venture.



(sitting l to r): Dr. B. Yegorov, K. Feoktistov, V. Nikolayeva-Tereshkova, and V. Komarov. [U]

In addition to such training opportunities, "Schools for Junior Cosmonauts" reportedly have been established at existing air force schools within the Soviet Union, and advanced training in cosmonautics may be obtained at a number of scientific institutes, primarily in Moscow and Leningrad.

#### Training facilities

Four cosmonaut training facilities have been identified in the Moscow area:

- The main Soviet cosmonaut training center is in a secured area at Monino, about 20 miles east of Moscow. The area is the base for the preliminary training of the cosmonauts. Equipment at this training base probably includes physical conditioning devices such as the rotating wheel and trampoline. The center also may have a centrifuge, at least one altitude chamber, an isolation chamber, and equipment for vestibular training as well as flight simulators.

- A second training facility has been identified, at Chikalovskaya (Shchelkovo) Airfield. Cosmonauts maintain their flying skills there and undergo weightless-condition training in specially equipped aircraft.

- A third cosmonaut training facility has been identified, at Tomilino, on the southeastern outskirts of Moscow. There cosmonauts undergo training using full-pressure spacesuits in a centrifuge. Tomilino also has engaged in research and development of spacesuits and equipment used for ejection of cosmonauts in re-entry.

- The fourth facility is the Zhukovskiy Air Engineering Academy, Moscow, where cosmonauts undergo theoretical training in rocket engineering, astronomy, and physics. After their flights into space, cosmonauts Gagarin, Titov, Popovich, Bykovskiy, and Tereshkova probably took special courses at this academy on new equipment and processed scientific data obtained by Soviet cosmonauts. Course work was accompanied by intensive physical training.

Space achievements by the Soviet Union thus far indicate the existence of an extensive and intensive but somewhat incomplete training program that is capable of expanding to meet the needs of additional space ventures. [END]

program of training to meet the needs of specific flights. Furthermore, the current Soviet training program can possibly provide a basis for predicting future developments in the program.

Training also takes place in the laboratories and plants where the boosters and spaceships are made. Cosmonaut trainees not only watch the assembly procedures but also participate in the testing of systems in operation. They often work with the scientists, designers, and engineers in perfecting individual units and mechanisms. In describing Cosmonaut G. S. Titov's training, one author stated that while Titov was in the booster plant he visited all the shops, questioned the designers, and "touched every screw on the rocket."

Potential cosmonauts may begin training at an early age. The Leningrad Club of Young Astronauts was organized in 1961. Of the 300 original members—ages 15 to 17—only 10 completed the first 2-year course, which included flying in jet planes, training in pressure and isolation chambers, parachute jumping, and studying radio astronomy, space medicine, and astronautics.

In late 1964 two-thirds of the Soviet cosmonauts probably had received preliminary flight training in the Voluntary Society for Cooperation with the Army, Air Force, and Navy (DOSAAF), the major organization responsible for pre-military and para-military training for all branches of the Soviet Armed Forces.