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A COMPARISON OF THE AMERICAN AND SOVIET

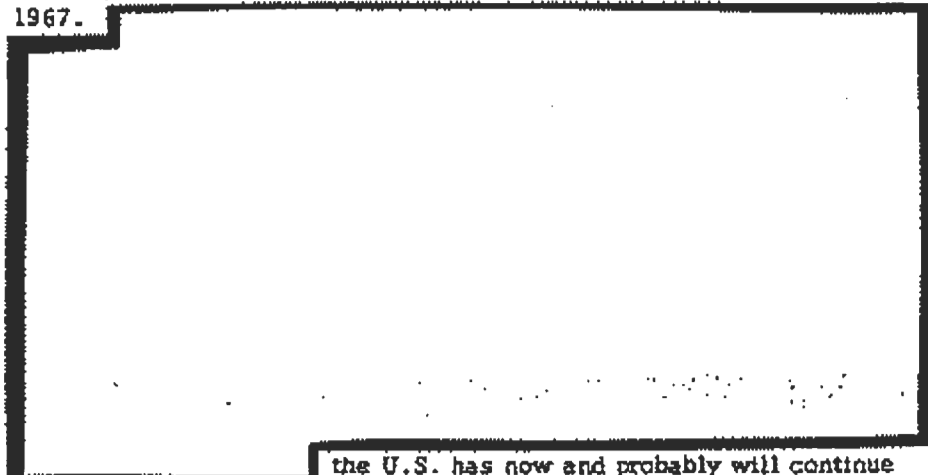
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SPACE PROGRAMS

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On the basis of a comparison of achievements to date, one would have to conclude that the U.S. is presently leading in the "space race". In the fields of manned lunar landing, manned space flight, unmanned lunar and interplanetary exploration, orbital applications, and near and deep-space scientific experimentation the U.S. is in almost every instance ahead of the U.S.S.R. In solid accomplishments. It should be borne in mind, however, that our examination of test programs really compares the results of policy decisions regarding the size and scope of space programs made by the two countries a number of years ago. The funds supporting the U.S. program have been reduced in recent years, and this will have a long-term impact on the U.S. program. So far as we can tell the Soviets have not to date reduced their funding level, and it is entirely possible that their space program will eclipse ours some years from now.

In preparation for the planned manned lunar landing within this decade, the U.S. launched its first Saturn V vehicle in November of 1967.



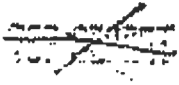
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the U.S. has now and probably will continue to enjoy a lead of a year or more in this area. There is also evidence that the U.S. has a comparable lead in spacecraft development and testing for this program.



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The United States has made five soft landings on the lunar surface with the Surveyor spacecraft, the first successful one occurring on 2 June 1966. We have also accomplished five highly successful lunar orbiters whose mission was to survey the lunar surface for potential Apollo landing sites. Although the Soviets have landed both Luna 9 and Luna 13 on the surface of the Moon, these probes lack the sophistication of the United States Surveyor series. As an example, the quality of the U.S. pictures was far superior to that of the photographs obtained by the Soviets. The Soviets have also placed payloads in orbit about the Moon on four occasions but evidence that they obtained high quality photographs of the lunar surface is completely lacking. The United States appears significantly ahead in these areas.

One interesting flight now under way is the Soviet Zond-5 mission, which is clearly an unmanned circumlunar flight where the probe is intended to return to earth and be recovered. If the mission is successful, then the Soviets will score a lunar "first". Furthermore, we feel that in the not-too-distant future they will try the same mission with men aboard. However, the booster for Zond-5 is only slightly larger than Saturn 1B, and is not capable of carrying the heavy payload needed for a manned landing. It must be therefore considered a "dead-end" program insofar as manned lunar exploration is concerned.

The United States through its Mercury and Gemini programs has taken a substantial lead. This lead is in total number of launches, total time in orbit, as well as the total number of astronauts with flight experience. The role of the United States astronaut appears to far outshadow that of his Soviet counterpart. The last successful Soviet flight occurred in late 1965 as their SOYUZ-1 flight in April 1967 culminated in the death of the cosmonaut, Vladimir Komarov.

The Soviets have launched 19 probes to Venus and Mars but only one successfully returned data from a planet (Venus-4). The U.S. have tried only 5 times, but three of our probes were successful. The U.S. Mariner flight is still the only probe to successfully fly by Mars and return data. The American and Soviet probes of Venus were complimentary in nature -- we flew by the planet and they penetrated deep into the Venus atmosphere. Thus the U.S. achievements measure up very well with those of the U.S.S.R. so far. It should be noted however, that unmanned interplanetary exploration is one field where the Soviets are very likely to take over world leadership. This is because of the lack of any significant U.S. programs presently

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planned beyond the 1969 Mars probes, and the fact that we are convinced the Russians will continue to have a very ambitious and long-term planetary program.

The United States weather satellite program began in 1960. The Soviets began to test their weather satellite in 1964 but did not obtain usable cloud pictures until 1966. Since then the Soviet weather satellites have generally performed as well as United States satellites but have been plagued by unreliability and short active lifetimes. It is also true that the U.S. transit navigation satellite program started years before the Soviet counterpart.

The United States took an early lead in satellite communications and has held it. Our communications satellites are fully operational and are shared by the many nations belonging to Intelsat. The Soviet Molniya communications satellite system is still in an experimental phase even by their standards. The feasibility has been demonstrated by the USSR's Molniya, but the system has yet to be put into daily use outside Russia.

The United States has an overwhelming lead in the exploration of near earth and interplanetary space. NASA has flown more scientific payloads over a wider range of orbits and trajectories. These satellites typically carry more experiments, produce much more data of a higher quality and last longer than their Soviet counterparts. The Soviets still use obsolete data transmission techniques requiring hand processing on the ground. Thus they typically take many times longer than United States scientists to analyze and publish the results of their experiments. Consequently, most of the existing scientific data on outer space is of U. S. origin.

The Soviet Union is currently supporting a satellite reconnaissance program



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Plans for the future Soviet space program, unknown to us, could cause a reversal in the present trend. For example, although the new large Soviet space booster is currently estimated to employ conventional propellants, it has the potential, if combined with new upper stages, to far surpass any capability planned by the United States.

