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MEMORANDUM

SUBJECT: Estimated Costs of the Soviet Space Programs

1. There is no direct information available on the actual expenditures of the USSR for its space achievements to date or for the developmental work already accomplished for as yet unidentified future space programs. Estimates of these expenditures, therefore, are subject to wide ranges of uncertainty and must be regarded as tentative.
2. In concept, the estimates of Soviet ruble expenditures for research, development, test and evaluation (RDT&E) include much if not all of the cost of the Soviet space effort. However, the breakdown of this category of expenditures is not available at this time. Consequently, the expenditures for Soviet space programs discussed in this memorandum are preliminary estimates expressed in equivalent US dollars and at present cannot be related to the aggregate RDT&E estimates. According to these preliminary estimates, the cumulative costs of the Soviet space programs through 1963 are equivalent to at least 5 billion dollars and perhaps as much as 10 billion dollars.
3. In the absence of direct information, estimates of costs for programs in the flight-test phase are made by valuing each observed Soviet program as if it were conducted in the US. This method entails selecting the most closely corresponding US program, adjusting the actual or estimated US costs for fundamental differences in US and Soviet program philosophies, hardware characteristics, and operational procedures, and finally, distributing the estimated Soviet costs through time for each program in accordance with the general pattern of expenditures in the analogous US program. The resulting estimates necessarily include a range, to account for the difficulty of modifying US data to reflect the cost of Soviet activity.
4. Even greater uncertainties are involved in estimating the cost of Soviet programs probably now underway but not yet identified through detection of flight tests. For example, the USSR probably has already made a considerable initial investment in a future effort

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to land a man on the moon, even if this effort is not competitive with the US Apollo program. If the Soviet effort is to be competitive, the expenditures to date could amount to the equivalent of several billion dollars. As yet, however, the Soviet timetable for a manned lunar landing is not known. An additional range, therefore, is included in the cost estimates to account for the uncertainties regarding this and other undetected programs.

5. The current estimates of annual Soviet expenditures for space flight are given in the table. In spite of the use of military boosters and facilities for space missions, Soviet outlays for space programs probably totaled in the neighborhood of 2 billion dollars through 1959, or roughly twice total US space expenditures up to that time. Although costly, this investment paid handsome dividends to the USSR in the form of a series of spectacular space accomplishments which created an aura of Soviet technological superiority and helped mask Soviet strategic weakness during this period. The estimated expenditures through 1959 reflect not only the costs of developing and launching the early Sputniks and lunar probes, but also the heavy developmental costs associated with the manned spaceflight, planetary probe and scientific satellite programs which were to appear in the early 1960s.

6. As indicated in the table, the range of uncertainty in the estimates for the years through 1961 is relatively narrow, inasmuch as these estimates have been constructed on the basis of historically observed activity through 1963. Although the level of expenditures shown for the period 1959-1961 remained about constant, actual Soviet outlays probably increased during this period, particularly in 1961, as a result of the development costs for new programs and new space hardware to be flown during the 1964-1965 period. Until these programs result in identifiable activity, however, there is no realistic basis for judging more precisely the level and rate of expenditures already incurred.

7. The level of current and future Soviet space outlays depends on whether the Soviets are involved in a competitive program to land a man on the moon in this decade, and on whether the Soviets will agree to US offers of cooperation in a joint lunar venture. As yet, there has been no clear-cut reaction from the USSR to this cooperative offer. There are indications, however, that the Soviets intend to continue an aggressive space flight program in the next few years, involving new missions and new space systems, and there seems little doubt that Soviet expenditures for space will continue to grow. Additional evidence during the next year or so should provide a clearer indication of Soviet intentions and objectives in space and form a basis for more refined cost estimates.

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ESTIMATED SOVIET SPACE EXPENDITURES THROUGH 1964

Year	Expenditures* (millions of dollars)
1957 and Prior	600 - 900
1958	400 - 600
1959	700 - 1,000
1960	700 - 1,000
1961	700 - 1,100
1962	1,000 - 2,100
1963	1,400 - 3,300
1964	2,000 - 5,000

* The lower limit of the estimates includes some allowance for a manned lunar landing program which is not competitive with the current US schedule; the upper limit reflects an allowance for a competitive manned lunar landing program.