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EVOLUTION OF SOVIET MILITARY FORCES AND BUDGETS, 1952-1964 (U)

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PREFACE

(U) This paper is one of a series being prepared as part of a comprehensive analytical history of the U.S.-Soviet strategic arms competition during the years 1945-1972. The effort was requested by the Secretary of Defense, is being coordinated by the OSD Historian, Dr. Alfred Goldberg, and is financed by the Defense Advanced Research Projects Agency. Several DOD components and private research organizations are engaged in various aspects of the history. Rand was assigned the task of examining the military forces and budgets of the superpowers. This Working Note deals with the USSR for the years 1952-1964. It is preceded by WN(L)-9248-ARPA covering the years 1945-1953, and will be followed by another document treating the remainder of the period.

(U) Other Rand studies now in progress for the history will provide the broad historical and strategic conceptual framework for the project and will examine the organizational and decisionmaking aspects affecting the forces and budgets of both the United States and the USSR. The ultimate integrative history is to be written by a Final Study Group headed by Professor Ernest R. May of Harvard University, serving as a consultant to the Historical Office, OSD.

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I. INTRODUCTION

(S) Unlike the previous installment, "Evolution of Soviet Military Forces and Budgets, 1945-1953," this report relies entirely on one data source for expenditure estimates--CIA's SCAM (Strategic Cost Analysis Model)--in the run of the spring of 1974. Since that time the SCAM calculations have been somewhat revised by the Office of Strategic Research, but the revision cannot be taken into account in this paper. An effort to assess the general impact of the revision is made at certain points in the discussion.

(U) The force estimates derive from SCAM and from DIA materials, principally order of battle figures transmitted in a memorandum to the Director of Defense Research and Engineering from the DIA's Assistant Deputy Director for Intelligence (S-12,011/DI-6D, 19 December 1972, Confidential). OB estimates are chronically subject to change, but it is believed that revisions now in preparation are unlikely to affect the substantive conclusions drawn from the present data.

(U) It is important to note that estimates appearing here are the products of relatively recent intelligence analysis. For the earlier years, particularly, they differ from the estimates made in those years, and do not represent the data then contemplated by U.S. decisionmakers in forming their perceptions of Soviet military postures. However, to the extent that they are accurate, they should reflect the force-structure decisions which the Soviet government made during the 1952-1964 period.

(U) The previous installment reported on the period 1945-1953, whose boundaries were defined by the end of World War II and the death of Stalin. This paper does not take up precisely where the other left off

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but reintroduces data for 1952 and even 1951, in order to consider whether the regime change in early 1953 was in fact a major turning point for military resource allocation policy. Although the terminal year of the period to be discussed, 1964, is the year of another regime change, we will reconsider the issue of turning point in the last installment by using a similar time overlap for the initial year of the third period. In the present paper the discussion views the twelve or thirteen-year interval as whole, rather than by subperiods, to avoid distortion by preconceived periodization.

(S) The growth and structure of expenditures are presented in three breakdowns--service, mission, and resource--while force estimates are viewed largely in a mission framework. Outlay patterns are computed from values at 1970 ruble prices. Unfortunately, CIA is unable to estimate outlays at current prices, so that for this reason as well as because of estimating errors, the calculated structural distributions cannot fully reflect the patterns perceived by the Soviet leadership.

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II. A SERVICE VIEW OF FORCES AND BUDGETS

A. Military Manpower¹

(S) An interesting feature of the Soviet military establishment is that in terms of manpower it shrank in size by about 58 percent between 1952 and 1961 and thereafter increased by only 9 percent by 1964 (Table 1). Much of the decrease occurred in the Ground Forces which in 1964 were only little more than one-fourth of their strength in 1952. The naval and air force manpower levels also declined during the period, by 41 percent and 19 percent respectively, in consonance with declining numbers of naval and air force aircraft (see Tables 3,6,7). The Soviet Strategic Rocket Forces, newly organized in 1959, experienced a rapid rise in manpower, and the Air Defense Forces an irregular increase over the whole period.

(S) The major changes, except for the Rocket Forces, had occurred by 1960. The Army, which had 63 percent of all manpower in 1952, possessed only 38 percent of it in 1960 and its share declined only slightly to 37 percent in 1964. The Navy, in spite of its drop in strength, was very stable in its share of total manpower, 10 percent to 15 percent throughout the period. The Air Forces with 7 percent of the men in 1952 represented about 15 percent of the total in 1960 and 13 percent in 1964. By the latter year the Rocket Forces had acquired about 7 percent of all military personnel, and had largely obtained them from the Army and the Air Forces. It is interesting to note that the Soviet military establishment has not been entirely immune to the disease of increasing overhead. The share of Command and General Support functions rose from about 8 percent in 1952 to around 15 percent in 1960 and remained at that level through 1964.

¹(U) For definitions, see next section on outlays.

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Table 1

ESTIMATES OF SOVIET MILITARY MANPOWER STRENGTH

1952-1964 (U)

(1000 men)

Force	1952	1953	1954	1955	1956	1957	1958	1959	1960	1961	1962	1963	1964
Ground Forces	4312	3731	3236	2998	2400	2168	1901	1803	1110	1110	1110	1113	1120
Naval Forces	692	725	749	705	616	593	589	510	428	396	395	409	410
Air Forces	492	520	555	497	515	534	562	543	433	412	410	407	397
AD Fighter Aviation	(100)	(116)	(138)	(95)	(103)	(113)	(127)	(127)	(125)	(122)	(123)	(115)	(111)
Air Defense Forces													
Including Fighter Aviation of AD	(332)	(337)	(371)	(352)	(381)	(398)	(392)	(371)	(345)	(355)	(403)	(416)	(431)
Excluding Fighter Aviation of AD	232	221	233	257	278	285	265	244	220	213	280	301	320
Rocket Forces	-	-	-	-	-	-	8	22	49	83	126	171	213
Security Forces	542	478	455	433	379	327	325	275	275	225	225	225	225
Command & General Support	569	520	486	498	500	470	435	432	434	452	465	465	465
TOTAL	6839	6194	5714	5388	4688	4377	4085	3829	2949	2891	3011	3091	3150

Source: CIA, SCAM-74.

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B. Outlays

(✓) The SCAM runs do not provide a direct service breakdown but are arranged instead by mission element. Service series were synthesized for present purposes from the following mission elements:

Ground Forces. Ground troops

Strategic Rocket Forces (SRF). Strategic attack: Missiles, intercontinental, and missiles, peripheral.

Air Forces. For some purposes it is useful to break this down further:

Long Range Air Forces (LRA). Strategic attack: bombers, intercontinental, and bombers, peripheral.

Frontal Aviation or Tactical Air. Ground: tactical air.

Military Transport Aviation. Military transport aviation.

PVO Strany. Strategic defense.

Navy. Also subdivided:

Strategic Forces. Strategic attack: missile submarines, intercontinental, and missile submarines, peripheral.

Other. Naval (including naval air).

(✓) Joint support outlays in the strategic attack mission were prorated among LRA, Navy (strategic forces), and SRF. The latter was established only in late 1959, but outlays on the strategic attack missile forces began, according to the CIA estimates, in 1955. Organizationally, then, the SRF entries for years prior to 1959 may be viewed as part of the LRA, although perhaps an increasingly restive element. Similarly, PVO strany was established 1955. Prior to that date the fighter interceptor

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component belongs with the Air Forces, AAA and SAM would be associated with the Ground Forces, and control and warning would presumably be distributed among the two services. The basic outlay calculations of this section assume that the SRF and PVO strany were in existence from the beginning of the period in order to highlight the changes in the expenditures involved. If PVO and SRF outlays in the years prior to their formal establishment are assigned as indicated, there is a noticeable effect on the indexes and percentage share of the Air Forces, but not on the patterns for the other services. This is explained below.

(S) The structure and growth of Soviet military outlays by service are shown graphically in Figs. 1-2; the computed percentages and indexes are displayed in Part I of the Appendix Table. Unfortunately, it is not possible to distribute RDT&E outlays by interested service (or by mission, for that matter), so that the structural calculation excludes RDT&E--as well as DOSAAF support, military security forces and outlays on reserve and retired personnel (pay and allowances)--from the sum of service expenditures.¹ The last three components are of minor importance: they accounted for only 7 percent of all military outlays in 1953, 6 percent in 1960 and 5 percent in 1964. RDT&E expenditures are discussed at a later point.

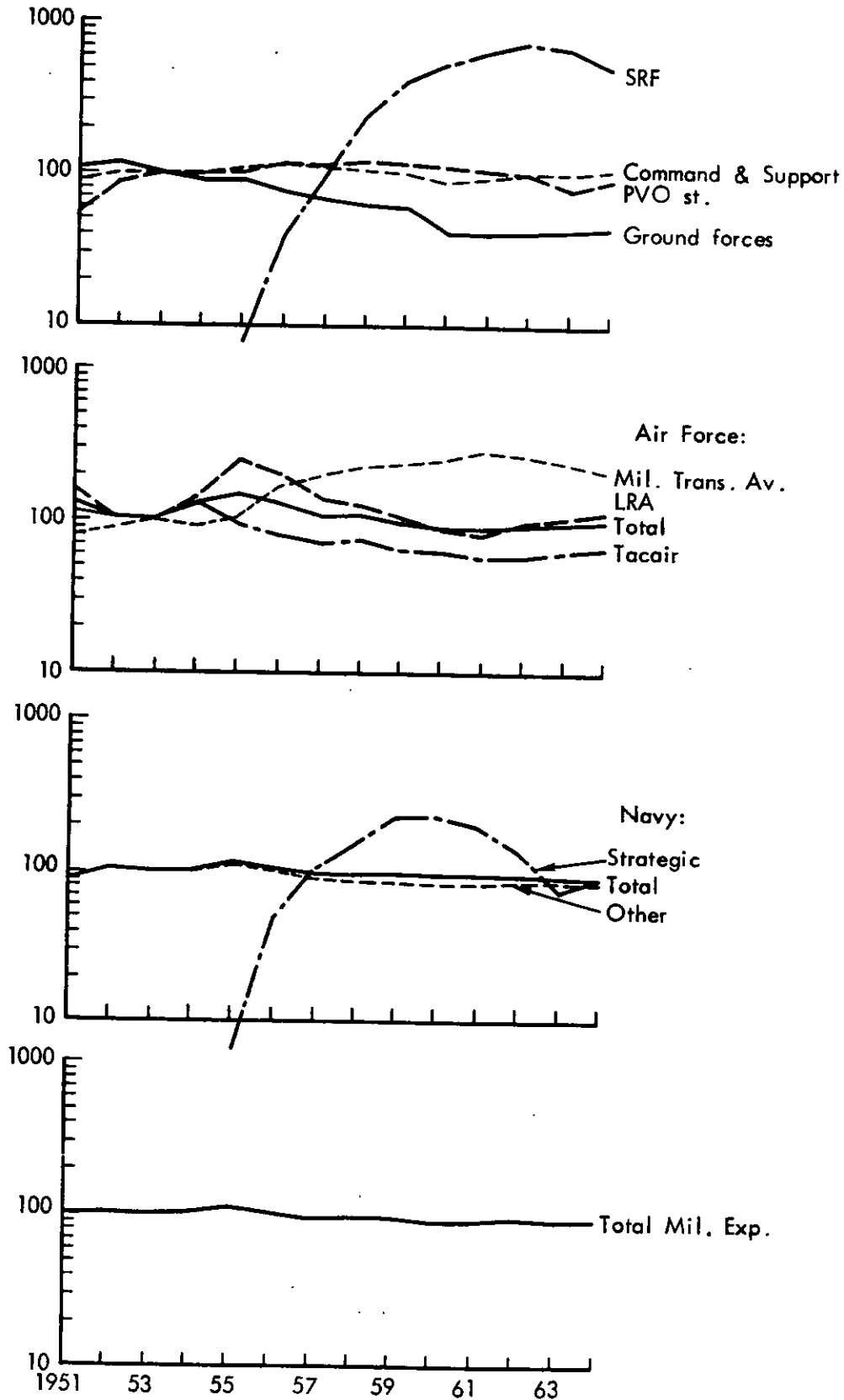
(S) On the whole, the decade and a half from 1951 is a period of relatively small annual changes in aggregate military expenditures.² In 1954-1955 the total increased by about 10 percent but thereafter a decline set in until 1960. The average level after 1956 was about

¹(S) In its published reports, CIA apparently adds military security to Ground Forces outlays and lumps pensions and reserve subsistence with Command & General Support. DOSAAF outlays and reserve pay are excluded altogether in the service breakdown.

²(U) Again, in the more limited aggregate defined above.

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*Except SRF and Navy, Strategic, where 1957=100.

Fig. 1 — Index of Soviet Military Expenditures by Service, 1951-1964 (U)
1953 = 100 *

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5-10 percent below that of 1953.

(S) Within this generally narrow pattern of overall change, there took place significant reallocations among the services. The Ground Forces fared worst. Outlays in this branch of the armed forces declined steadily until 1961--¹ with a particularly sharp drop in 1960, by which time the Ground Forces were getting about four-fifths less than they received in 1953. The recovery to 1964 was slight. In sharp contrast, outlays on the SRF (or elements that were grouped under the SRF after late 1959) rose at an extremely sharp pace and by 1962 were almost eight times as large as in 1957, almost twice as large as in 1959.

(S) These were the extremes. Other service expenditures moved within the limits. Air defense outlays (PVO strany) achieved considerable growth between 1951 and 1956-1958 (123 percent) before sliding back in the next five years below the 1953 mark. Similarly, expenditures on Command and General Support rose 14 percent between 1951 and 1955 and then declined by about 20 percent by 1960, before picking up again in 1961-1964. Navy outlays were perhaps the most stable, with a peak-to-trough margin of only one-quarter.

(S) Total Air Force expenditures fluctuated sharply: down by one-third in 1951-1953, up by almost half in 1954-1955 and then a long 40 percent slide down to a level in 1961 10 percent below the 1953 mark. In 1962-1964 this gap was almost made up. Within the Air Force total, individual components exhibited considerable variation. Thus, the general pattern of LRA changes is about the same as for the Air Force as a whole,

¹ (S) When PVO and SRF are assigned to other services before 1955 and 1960, respectively, the Ground Forces index shows a smaller decrease in 1954 and a decrease instead of an increase in 1955.

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but the 1954-1955 increase and the subsequent drop are sharper than for the aggregate. Frontal Aviation (or tactical air) outlays declined 55 percent in 1952-1953. Interrupted by two brief recoveries (in 1954 and 1958), the decline continued to 1961. Even with an upswing in 1962-1964, tactical air expenditures in 1964 were a third below the 1953 level and 57 percent below the 1951 figure. On the other hand, military transport aviation generally showed an upward growth trend, except in 1959 and 1962-1964, so that the final point was more than twice as large as the 1953-1955 level.

(8) When PVO and SRF expenditures are assigned to other services, the effect on total Air Force outlays may be observed from the following tabulation (1953=100):

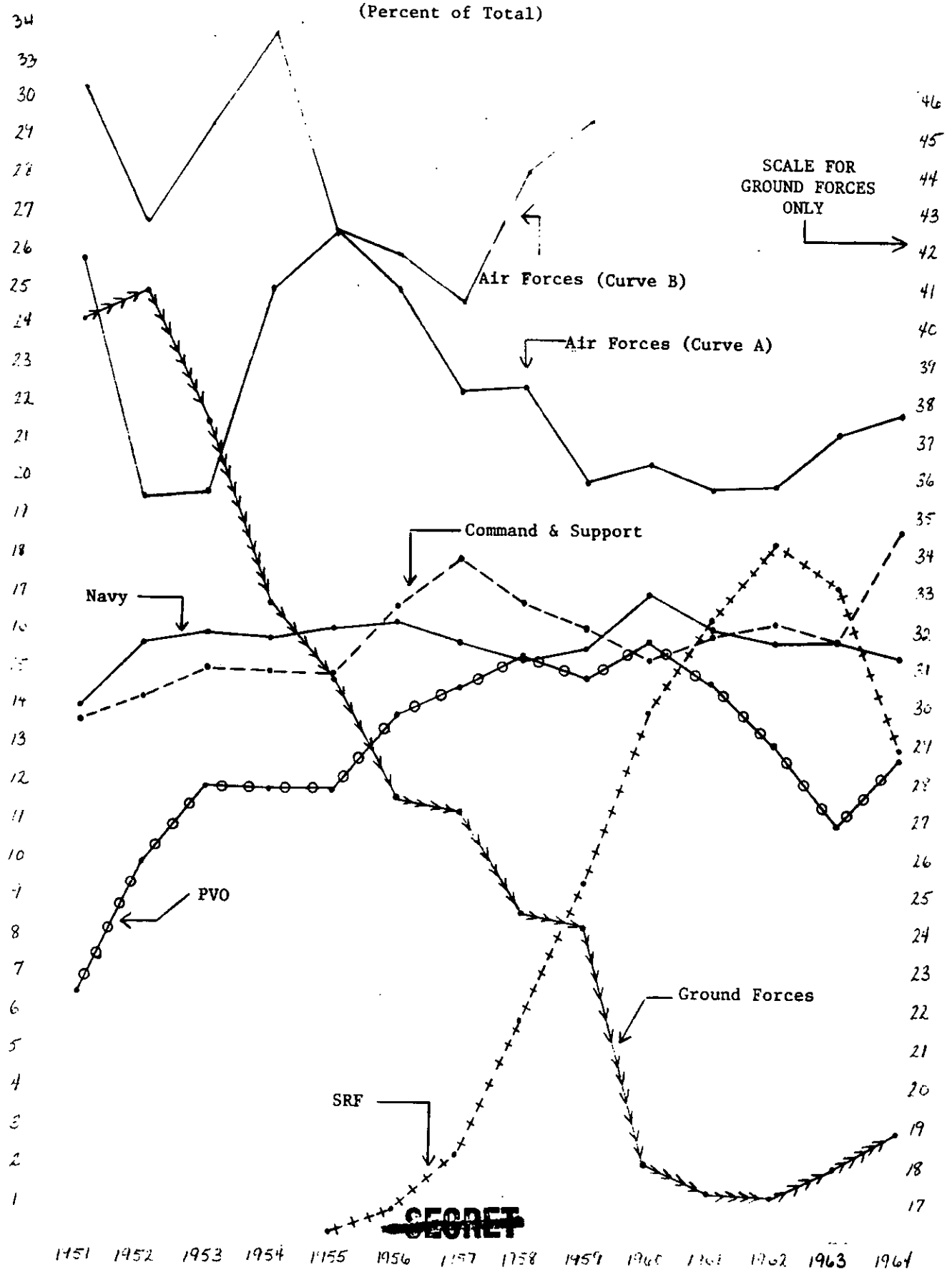
	<u>PVO and SRF before 1955 and 1960</u>	
	<u>Assigned to Other Services</u>	<u>Separated Out</u>
1951	104	132
1952	95	103
1953	100	100
1954	117	130
1955	100	148
1956	91	131
1957	80	107
1958	91	108
1959	95	96
1960	61	90

(8) The effect of assigning PVO and SRF to other services is to neutralize a sharp increase in 1954-1955, considerably round off an equally sharp decline in the succeeding two years, and convert a moderate drop in 1957-1959 into an almost 20 percent rise. Naturally, the 1960

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Fig. 2-STRUCTURE OF SOVIET MILITARY OUTLAYS BY SERVICE
1951-1964



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figure in the first column falls markedly below the previous year's mark, to reflect the transfer of operations to a new institutional entity.

(8) The divergent growth trends explained above result in marked changes in service shares of total outlays. Considering first the distribution when PVO and SRF outlays are separated out, we note that the relative weight of the Ground Forces decreased monotonically from 1952 to 1962, by about 60 percent, with a particularly sharp drop in 1960. On the other hand, the share of those outlays which were organized under the roof of SRF in late 1959 increased monotonically from the point of inception to 1962, from two-tenths of a percent to over 18 percent. There was also considerable growth in the share of PVO strany, from only 6.5 percent in 1951 to almost 16 percent in 1960. The Air Forces' claim (curve A in Figure 2), which declined sharply in 1952-1953, increased in the next two years to a level surpassing the 1951 base, but then began a gradual decline, which was arrested only in 1963. The share of the total allocated to the Navy showed some slight tendency to increase until 1960 but dropped off thereafter. It is probably more appropriate to say that the Navy maintained a relatively constant percentage claim on Soviet military resources in the decade after 1952.

(8) Assignment of PVO and SRF outlays in the 1950s to the relevant services has no effect on the Navy's share or that of Command and Support. The share of the Ground Forces is raised in 1951-1954 and the decline in 1955 is sharper, but the pattern is unaffected. The significant impact is on the relative weight of the Air Force, shown by the shift to curve B in Figure 2. Of course, the Air Force's share is raised by the assignment

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of PVO and SRF outlays, especially in 1952-1954 (with increasing air defense expenditures) and again in 1958-1959 (as future-SRF outlays begin to climb steeply). Reversal of trend appears only in 1958-1959.

(6) What difference did the death of Stalin make? By these CIA data, the decline in the relative importance of the Ground Forces, which was implied by the estimates in our previous report for the late 1940's and early 1950's, was accelerated. No immediate change is apparent in the rates of PVO, Navy, and Command and Support, but the Air Force's share (excluding PVO and SRF) jumps substantially in two years. Thereafter the Air Force experiences seven lean years (with PVO and SRF excluded) with a seven percentage point drop in its share of total outlays. The Ground Forces experience an even more difficult time, dropping from near 31 percent of the aggregate to 17 percent by 1962. On the other hand, PVO shows a new burst of growth lasting until 1960, and of course, SRF-type outlays began only in 1955. It should be noted, in this connection, that whereas total outlays are estimated by CIA to have increased 10 percent in 1954-1955, the series values decline, on balance, until 1960. Thus, declining shares between 1955 and 1960 mean more sharply declining absolute levels.

(8) From 1955 to 1960 the Ground Force share was reduced 13 points, all of which and more went to the SRF. The long decline of the relative weight of Ground Force outlays seems to have ended in 1960-1961; there is a reversal also in the PVO share at this time, but in the opposite direction. SRF outlays as a proportion of the total display a sharp swing up but an equally sharp one down. Moderate changes in opposite directions take place in Navy and Air Forces shares.

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III. THE FORCE STRUCTURES

A. The Strategic Attack and Defense Forces

(C) Early in this period, the USSR deployed its first strategic forces of truly intercontinental range. In 1956 the large TU-95 (Bear) and M-4 (Bison) bombers appeared in operational units. In 1959 the first nuclear powered ballistic missile submarine (H-I) entered service. In 1960 came the first land-based ICBMs (SS-6). And in 1964 a second SSBN (H-II) became operational.

(C) During the same years a strategic capability for peripheral attack with shorter range weapons was not neglected. The TU-16 (Badger) jet bomber was introduced in 1954, and large numbers of these machines were deployed in both the Air Force and naval aviation. This aircraft replaced the piston engined TU-4 (B-29 copy) which was phased out in 1959. In 1957 the USSR began deployment of surface-to-surface missiles (SS-3) armed with nuclear warheads and with ranges sufficient, in later systems (SS-4&5), to cover all of Western Europe and Great Britain in the west and Japan and large areas of China in the east. In addition, four classes (Z conversion, J, G, G-II) of ballistic missile submarines became operational.

(U) The traditional emphasis on strong air defenses was continued. Substantial fighter forces were maintained and improved by the introduction of several all-weather designs. In 1954 the first surface-to-air missile system appeared, and at the outset was massively arranged around Moscow. Two additional SAM systems were deployed during the 1954-1964 period. Further, the SU continued to maintain fairly considerable quantities of anti-aircraft artillery into the early 1960s.

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(U) The tables on the following pages present annual estimates of the strategic order of battle, offensive and defensive, for the 1952-1964 years.

(S) Looking backward, it would now appear that the two intercontinental bombers were probably never intended as a major element in the Soviet strategic offensive force. The major role was destined to be assumed by the ICBM and the submarine launched missile systems. Nevertheless, the successful development and production of the large bombers constituted a valuable hedge against failure or delay of the ballistic missile systems. Two large aircraft plants, one for each of the two heavy bombers, were in the program and could have materially increased output had the need arisen. The appearance of these two machines in Soviet skies made a profound impression in the Pentagon and changed its perceptions as to the dimensions of the Soviet threat. It later became clear that actual production rates of the TU-95 (Bear) and M-4 (Bison) were substantially below those estimated by U.S. intelligence.

(S) The shock of Sputnik and Khrushchev's rhetoric about Soviet armed might combined to lend weight to the advent of the SS-6, perhaps the world's first operational ICBM, in 1960. Two additional systems (SS-7 and SS-8), each in a soft and a hard version, appeared by 1964. The early appearance of the SS-6, together with factors in the U.S. domestic scene gave rise to the famous "missile gap" between estimated future Soviet ICBM strength and programmed U.S. ICBM strength. The gap disappeared, however, as the U.S. intelligence appreciation of the Soviet program improved and as U.S. deployment increased. In 1964 the USSR had 193 ICBMs deployed; in the same year the U.S. had 787, primarily Minuteman 30A and 30B.

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Table 2
ESTIMATED SOVIET STRATEGIC OFFENSIVE ORDER OF BATTLE, 1952-1964 (U)

Type	1952	1953	1954	1955	1956	1957	1958	1959	1960	1961	1962	1963	1964
<u>Intercontinental</u>													
Air Force Aircraft					45	80	105	130	155	180	190	200	205
TU-95 (Bear)					20	30	50	55	65	80	90	105	110
M-4 (Bison)					25	50	55	75	90	100	100	95	95
ICBM									2	10	36	109	193
SS-6									2	4	4	4	4
SS-7 (soft)										6	32	90	128
SS-7 (hard)												15	42
SS-8 (soft)													14
SS-8 (hard)													5
Missile Submarines								1	4	8	12	16	22
H-I (SSBN)								1	4	7	9	9	8
H-II (SSBN)													1
E-I (SSGN)										1	3	5	5
E-II (SSGN)												2	8
<u>Peripheral</u>													
Air Force Aircraft	900	1075	1320	1280	1275	1325	1270	1225	1050	990	970	930	925
TU-4 (Bull)	850	1050	1300	1100	800	560	415	225					
TU-16 (Badger)			20	180	475	765	855	1000	1050	990	960	900	875
TU-22 (Blinder)											10	30	50
B-25	50	25											
Naval Aircraft					20	40	150	240	275	300	320	375	445
TU-16 (Badger)					20	40	150	240	275	300	320	360	400
TU-22 (Blinder)												15	45
Missile Submarines						2	5	9	15	25	37	41	45
Z Conversion (SSB)						2	5	6	6	6	6	6	6
G-I (SSB)								3	9	16	22	22	22
G-II (SSB)												1	1
J (SSG)												2	5
W (Twin Cylinder/SSG)										3	5	5	5
W (Long Bin/SSG)											4	5	6
I/MRBM						20	48	120	280	484	588	668	709
SS-3 (soft)						20	32	32	32	32	32	32	32
SS-4 (soft)							16	88	248	448	492	492	492
SS-4 (hard)											36	76	84
SS-5 (soft)										4	28	50	50
SS-5 (hard)												18	51

Sources: DIA, S-12, 011/DI-6D, 19 December 1972, and CIA, SCAM.

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Table 3

ESTIMATED SOVIET STRATEGIC DEFENSIVE ORDER OF BATTLE, 1952-1964 (U)

Type	1952	1953	1954	1955	1956	1957	1958	1959	1960	1961	1962	1963	1964
Fighters	5555	6945	5565	3760	3800	3885	4350	4275	4875	4745	4680	4350	4130
LA-5/7 (Fin)	65	10	-	-	-	-	-	-	-	-	-	-	-
LA-9/11 (Fritz/Fang)	400	320	230	-	-	-	-	-	-	-	-	-	-
MIG-9 (Fargo)	70	-	-	-	-	-	-	-	-	-	-	-	-
MIG-15 (Fagot)	}4300	}6050	3100	1715	1325	980	720	625	470	265	125	100	75
MIG-17 (Fresco)			1900	2010	2350	2645	3280	3275	3155	3085	3075	2685	2325
MIG-19 (Farmer)	-	-	-	-	-	-	-	-	720	745	745	710	700
SU-7 (Fitter)	-	-	-	-	-	-	-	-	20	30	35	35	35
SU-9/11 (Fishpot)	-	-	-	-	-	-	-	25	120	250	400	520	675
YAK-3/9 (Frank)	250	165	160	-	-	-	-	-	-	-	-	-	-
YAK-23 (Flora)	420	390	175	-	-	-	-	-	-	-	-	-	-
YAK-25 (Flashlight)	-	-	-	35	125	260	350	350	390	370	300	300	290
YAK-28 (Firebar)	-	-	-	-	-	-	-	-	-	-	-	-	30 ¹⁶
P-39	10	-	-	-	-	-	-	-	-	-	-	-	-
P-63	40	10	-	-	-	-	-	-	-	-	-	-	-
Surface-to-Air Missiles													
SA-1 sites*	-	-	5	30	56	56	56	56	56	56	56	56	56
SA-2 sites**	-	-	-	-	-	-	-	30	160	370	620	730	780
SA-3 sites***	-	-	-	-	-	-	-	-	-	2	38	75	88
Anti-Aircraft Artillery													
37 mm	10000	8250	6750	5750	4750	3500	2000	750	350	-	na	na	na
57 mm S	2750	3500	4250	4750	5250	5750	5750	5350	5100	4850	na	na	na
57 mm T	600	800	950	1100	1250	1300	1300	1300	1300	1250	na	na	na
85 mm	1750	1250	900	750	650	550	450	350	200	-	na	na	na
100 mm	1600	2500	3500	3900	3750	3650	3500	3300	3100	2900	na	na	na
122/130 mm	-	-	-	30	145	300	430	480	450	385	na	na	na
TOTAL	16700	16300	16350	16280	15795	15050	13430	11530	10500	9385			

*Usually 60 launches per site.

**Usually 6 launches per site.

***Usually 8 launches per site.

Sources: DIA, S-12, 011/DI-6D, 19 December 1972. The Rand Corporation, RM-3508, May 1963. CIA, SCAM.

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(S) In the case of ballistic missile submarines, the Soviet nuclear powered H-I took to sea about 1 1/2 years before Polaris. The H-I carried only 3 SS-N-4 missiles with a range of 500 nautical miles. A second version of this SSBN, the H-II, appeared in 1964 and carried three SS-N-5 missiles of 700 nautical mile range. These ballistic missile craft were supplemented by two nuclear powered submarines carrying surface launched cruise missiles with ranges from 220 to 250 nautical miles. While the Soviets were first in the field of submarine-launched missiles, the U.S. Polaris system was far superior and carried weapons of much greater range. This renders comparison difficult, but it may be noted that by 1964, the U.S. had 15 boats carrying a total 240 A-1 and A-2 missiles; in the same year, the USSR had 22 boats carrying 105 missiles of much shorter range.

(S) With respect to strategic offensive forces with ranges covering territories peripheral to its own, the USSR maintained large Air Force and Naval Aviation medium bomber fleets during the 1952-1964 period. Total numbers of Air Force planes declined while Naval Aviation increased in strength. A notable development was the introduction of three nuclear surface-to-surface ballistic missile systems in several variants possessing ranges up to 2200 nautical miles. By 1964, more than 700 such missiles were deployed. In addition, three classes of ballistic missile firing submarines, and one class with cruise missiles were placed in service with missiles of up to 700 nautical mile range.

(S) In the foregoing paragraphs, we have noted the main developments in Soviet strategic offensive capability in the years 1952-1964. At the same time, the USSR greatly enhanced its defensive strength against attack on the homeland. Five new generic fighter interceptor designs with several

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variants of both these and existing types were deployed. Of importance was the acquisition of an all-weather fighter capability, of which there were essentially none in 1954. By 1964, one-third of the fighter interceptor force consisted of all-weather types. It is interesting that the total numbers of interceptor declined steadily from 1960 through 1964. Probably the major reason for this was the acquisition of a formidable surface-to-air defensive missile force. Three weapons with this function were deployed during the period. The first of these, the SA-1, was located only at Moscow; the two ensuing systems (SA-2 and SA-3) were widely dispersed in many localities. As noted previously, the USSR maintained rather large anti-aircraft artillery forces into the 1960's.

B. The General Purpose Forces (U)

~~(S)~~ 1. Army. Strength data on ground forces are difficult to deal with, particularly prior to 1955, because of the complexity and fluidity of their organization and because of the changing perceptions of U.S. intelligence analysts concerning the structure of these forces. The most reliable and consistent data pertain to the divisional structure, which includes from 55% to 60% of total ground forces manpower. The remaining manpower is included in other types of organizational units--combined armies, tank armies, military districts and in wartime, fronts, and corps and corps headquarters, constituting a mixture of combat and administrative units. In Table 4 are presented estimates of the numbers of divisions, and manpower in both in divisions and in the other types of units.

~~(S)~~ As already noted, the ground forces shrank in size in terms of manpower, and were in 1964 only a little more than one-fourth of their

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Table 4

ESTIMATED SOVIET GROUND FORCES DIVISIONAL ORDER OF BATTLE
AND MANPOWER STRENGTH IN ALL ORGANIZATIONAL UNITS, 1952-1964 (U)

(Numbers of Divisions and Thousands of Men)

Item	1952	1953	1954	1955	1956	1957	1958	1959	1960	1961	1962	1963	1964
Airborne Division	5	6	7	10	10	10	9	10	7	7	7	7	7
Rifle Division	132	115	80	90	72	58	37	31	--	--	--	--	--
Mtzd. Rifle Division	--	--	--	--	9	15	44	59	83	83	83	84	86
Tank Division	25	24	18	20	24	24	24	24	51	51	51	51	50
Mechanized Division	50	50	48	55	50	53	40	31	--	--	--	--	--
Artillery Division	19	16	--	--	--	--	--	--	--	--	--	--	--
Total Divisions	231	211	153	175	165	160	154	155	141	141	141	142	143

Manpower (1000)

Airborne Division	42	50	48	84	82	79	68	68	53	53	53	53	53
Rifle Division	1485	1258	988	825	538	426	204	152	--	--	--	--	--
Mtzd. Rifle Division	--	--	--	--	99	165	431	550	347	347	349	349	358
Tank Division	287	254	209	170	204	204	199	199	267	267	267	267	262
Mechanized Division	710	646	624	600	441	387	208	103	--	--	--	--	--
Artillery Division	132	115	--	--	--	--	--	--	--	--	--	--	--
Total Divisions	2656	2323	1869	1679	1364	1261	1110	1072	667	667	669	668	673
Combined Armies*	--	--	--	315	281	266	250	248	68	68	68	68	68
Tank Armies*	--	--	--	136	118	95	94	91	30	30	30	30	30
Front-Mil Districts*	--	--	--	640	530	455	355	300	316	316	316	317	320
Corps & Corps Hq.*	--	--	--	228	98	74	72	72	30	30	30	30	30
Other Units*	730	636	1367	0	9	17	20	20	0	0	0	0	0
Total	730	636	1367	1019	1027	907	791	731	444	444	444	445	448
Total Manpower (1000)	3386	2959	3236	2998	2400	2168	1901	1803	1111	1111	1110	1113	1120

Source: CIA, SCAM.

* Prior to 1955 there is no information on the distribution of manpower among these organizations, hence all are placed in "Other Units."

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strength in 1954 as forces were phased down in the post-Korea years. In terms of numbers of divisions, however, there was a good degree of stability. In the last seven years of the period the numbers of divisions varied between 141 and 155.¹ The composition of the divisional structure changed, however, with the phasing out of the rifle division and the advent of the motorized rifle division, and the near tripling of tank divisions as the mechanized divisions disappeared.

~~(S)~~ During the 1952-64 period, the ground forces underwent further modernization. Several new tank and assault gun weapons were provided to the troops, including the T-10M heavy tank, the T-55 and T-62 medium tanks, the PT-76 armored amphibious vehicle, and the ASU-57 and ASU-85 assault guns. Three new types of anti-aircraft artillery appeared, the latest being the ZU-23 in 1964. In addition, seven new designs of field guns and howitzers were placed in service as well as a variety of small guns.

~~(S)~~ 2. The Naval Forces. In this section we are not concerned with the missile submarines as they have already been noted in the discussion of strategic offensive forces. Here, we deal with the major surface ships and attack submarines. The size of the Soviet surface fleet in 1964 (200 modern vessels plus 1 old vessel) was virtually the same as it had been in 1952 (195 modern vessels plus 21 old vessels). The strength of the fleet of modern submarines, however, increased by 1.3 times, and the large fleet of old submarines--73 in 1952--had entirely disappeared by 1961. It should be noted that intelligence analysts generally define "old" vessels as those of 15 to 20 or more years of age.

¹(U) One should note that many Soviet divisions were at less than full strength and that reliance would be based on their rapid build-up in case of need.

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(S) Probably the major development in the Soviet Navy during the 1954-64 years was the appearance of the guided cruise missile on both surface ships and submarines. The Soviet guided cruise missiles, with ranges from 25 to 250 nautical miles, are effective anti-ship weapons and can also be employed against shore installations. The first vessel to be equipped with these weapons was the guided missile destroyer Kildin, a new class in 1958. Other types with these missiles were the Kotlin class destroyer, the Sverdlov and Kynda classes of light cruisers, and the Kashin class frigate. By 1964, 17 surface ships were so equipped. In addition, three classes of submarines (SSG's Single Cylinder, Twin Cylinder, and Long Bin) were equipped with guided cruise missiles in the early 1960's and 11 were in service by 1964.

(U) Estimates of the Soviet Naval order-of-battle for this period appear in Table 5. Due to lack of time, we omit consideration of the many types of minor combat vessels and support vessels numbering in the hundreds, even though these are of some importance, as has been evident in Mid-East conflicts.

(S) 3. The Tactical Air Forces. In the USSR, the principal function of these forces is support of the ground troops, and tactical squadrons are under the operational control of regional army commanders. Tactical aviation forces of the USSR have always been several times larger than those of the U.S., on the order of six times in 1952, 3 times in 1960, and about 2 1/2 times in 1964. Since U.S. tactical air forces during this period were stable in number (1300-1500 a/c), it is clear that the USSR's tactical aviation has been decreasing in size. In 1952, it possessed over 10,000 planes, in 1960 about 4,655 and in 1964 3,245. This is a notable decline in part compensated by the introduction of several variants of fighter aircraft of

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Table 5

ESTIMATED SOVIET NAVAL ORDER OF BATTLE, 1952-1964 (U)
(Excluding Guided Missile Submarines)

Type	1952	1953	1954	1955	1956	1957	1958	1959	1960	1961	1962	1963	1964
Major Surface Ships													
Modern:	195	182	197	199	211	222	232	224	214	186	196	199	200
Guided Msl Cruiser	--	--	--	--	--	--	--	1	1	2	2	2	2
Light Cruiser	12	14	18	19	20	20	20	19	18	16	16	15	15
Gd Msl Light Cruiser	--	--	--	--	--	--	--	--	--	--	1	2	2
Destroyer	110	118	118	119	121	128	133	123	117	92	88	85	83
Gd Msl Destroyer	--	--	--	--	--	--	1	4	6	9	13	13	13
Destroyer Escort	4	7	30	47	59	66	68	68	66	66	66	62	58
Frigate	68	42	31	14	11	8	10	9	6	1	--	--	--
Gd Msl Frigate	--	--	--	--	--	--	--	--	--	--	--	--	--
Coastal Defense	1	1	--	--	--	--	--	--	--	--	--	1	2
Coastal Escort	--	--	--	--	--	--	--	--	--	--	10	19	25
Old:	21	35	19	10	11	10	9	18	18	30	17	5	5
Battleships	3	3	3	3	2	1	1	--	--	--	--	--	--
Heavy Cruiser	7	7	6	6	5	5	5	5	4	4	4	4	4
Light Cruiser	1	1	--	--	--	--	--	--	--	--	--	--	--
Destroyer	5	5	1	--	3	3	2	12	13	25	13	1	1
Frigate	1	16	9	1	1	1	1	1	1	1	--	--	--
Coastal Defense	4	3	--	--	--	--	--	--	--	--	--	--	--
Total Surface	216	217	216	209	222	232	241	242	232	216	213	204	205
Submarines													
Modern:	246	235	215	233	299	338	336	340	321	324	345	349	321
Long Range	68	55	28	20	19	19	20	33	30	38	46	57	63
Medium Range	55	75	94	146	223	271	268	259	243	238	251	244	237
Short Range	123	105	93	67	57	48	48	48	48	48	48	48	21
Old:	73	110	162	189	150	129	79	47	16	--	--	--	--
Long Range	13	30	57	69	74	63	43	20	--	--	--	--	--
Medium Range	18	20	34	41	9	4	2	8	8	--	--	--	--
Short Range	42	60	71	79	67	62	34	19	8	--	--	--	--
Total Submarines	319	345	377	422	449	467	415	387	337	324	345	349	321

Sources: ONI, "A Survey of Soviet Naval Construction," May 1953; DIA, S-12, 011/DI-6D, 19 December 1972; CIA, SCAM.

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new design, particularly the MIG-19, the MIG-21, and the SU-7. Curiously, for many years of the period, the tactical bomber force was largely or entirely composed of the obsolescent IL-28. It was not until 1962 that the new and better bomber (YAK-28) attained deployment status. Table 6 presents the order of battle estimates.

~~(S)~~ 4. Naval Aviation Forces. These forces are under the control of fleet commanders. Prior to 1959, the Navy had fighter defense forces, but these were transferred to the Fighter Aviation of Air Defense in 1959. Thereafter the Navy possessed no fighter planes. Its bomber force declined from 1,050 in 1952 to 375 in 1960, but had increased to 555 in 1964. The bulk of this force was composed of the relatively modern TU-16 (Badger). The WW II types were out of service by 1956. Details appear in Table 7.

~~(S)~~ 5. Military Transport Aviation. The USSR has long maintained a considerable military air transport service. We do not have reliable time series on the numbers of aircraft by type for this service. Indications are that in 1954 there were between 1,700 and 2,200 light twin-engine transports in service, and no heavier planes. These were the LI-2 (DC-3 copy) and the IL-12 and IL-14, similar to the Convair. It was not until 1957 that the TU-104, a twin-jet version of the TU-16 (Badger) bomber appeared. Between 1959 and 1962, six new designs, all with turboprop engines, entered service. The one with the longest range, about 3,200 miles, was the IL-18 (Coot), and it became operational in 1961. It is curious that a country the size of the USSR did not have heavy long range transport aircraft prior to this time. Perhaps the delay was due to technological and production constraints, particularly the latter as the prior presence of the Bison and Bear heavy bombers show that technology could not have been a great barrier.

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Table 6

ESTIMATED SOVIET TACTICAL AVIATION ORDER OF BATTLE, 1952-1964 (U)

Type	1952	1953	1954	1955	1956	1957	1958	1959	1960	1961	1962	1963	1964
Bombers	4900	4300	4100	3600	3150	2800	2900	2950	1765	800	665	760	635
IL-2/10 (Bark/Beast)	2000	1800	1600	1100	450	--	--	--	--	--	--	--	--
IL-28 (Beagle)	800	1550	2100	2500	2700	2800	2900	2950	1765	800	630	705	555
PE-2 (Buck)	600	--	--	--	--	--	--	--	--	--	--	--	--
TU-2 (Bat)	1500	950	400	--	--	--	--	--	--	--	--	--	--
YAK-28 (Brewer)	--	--	--	--	--	--	--	--	--	--	35	55	80
Fighters	5615	5575	5880	5200	5235	5295	5330	4320	2890	2510	2450	2495	2610
LA-9/11 (Fritz/Fang)	1200	935	680	280	--	--	--	--	--	--	--	--	--
MIG-9 (Fargo)	35	--	--	--	--	--	--	--	--	--	--	--	--
MIG-15/17 (Fagot/Fresco)	2900	3800	4700	4900	5100	4950	4850	3900	2550	2010	1660	1530	1380
MIG-19 (Farmer)	--	--	--	20	110	250	360	300	210	175	300	245	210
MIG-21 (Fishbed)	--	--	--	--	--	--	--	--	50	180	270	390	600
SU-7 (Fitter)	--	--	--	--	--	--	--	--	15	80	155	275	390
YAK-3/9 (Frank)	1175	840	500	--	--	--	--	--	--	--	--	--	--
YAK-23 (Flora)	280	--	--	--	--	--	--	--	--	--	--	--	--
YAK-28 (Flashlight)	--	--	--	--	25	95	120	120	65	65	65	55	30
P-63	25	--	--	--	--	--	--	--	--	--	--	--	--
TOTAL	10,515	9875	9980	8800	8385	8095	8230	7270	4655	3310	3115	3255	3245

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Table 7

ESTIMATED SOVIET NAVAL AVIATION ORDER OF BATTLE, 1952-1964 (U)

Type	1952	1953	1954	1955	1956	1957	1958	1959	1960	1961	1962	1963	1964
Bombers	1050	975	950	950	920	800	900	790	375	335	365	445	555
IL-2/10 (Bark/Beast)	150	100	100	100	80	--	--	--	--	--	--	--	--
IL-28 (Beagle)	100	200	400	600	600	600	600	400	100	35	45	70	110
PE-2 (Buck)	75	--	--	--	--	--	--	--	--	--	--	--	--
TU-2 (Bat)	600	400	200	--	--	--	--	--	--	--	--	--	--
TU-14 (Bosun)	100	250	250	250	220	160	150	150	--	--	--	--	--
TU-16 (Badger)	--	--	--	--	20	40	150	240	275	300	320	360	400
TU-22 (Blinder)	--	--	--	--	--	--	--	--	--	--	--	15	45
B-25	25	25	--	--	--	--	--	--	--	--	--	--	--
Fighters	1575	2290	2920	1910	1900	1800	1745	1590	--	--	--	--	--
MIG-9 (Fargo)	35	--	--	--	--	--	--	--	--	--	--	--	--
MIG-15/17 (Fagot/Fresco)	1400	2150	2800	1900	1825	1625	1485	1330	--	--	--	--	--
MIG-19 (Farmer)	--	--	--	--	50	125	210	210	--	--	--	--	--
YAK-23 (Flora)	140	140	120	--	--	--	--	--	--	--	--	--	--
YAK-25 (Flashlight)	--	--	--	10	25	50	50	50	--	--	--	--	--
Recon	180	180	190	170	160	150	145	110	110	85	85	80	70
PBY-6A	180	170	130	60	--	--	--	--	--	--	--	--	--
BE-6 (Madge)	--	10	60	110	160	150	145	110	110	80	80	75	65
M-10 (Mallow)	--	--	--	--	--	--	--	--	--	5	5	5	5
Helicopters													
MI-4 (Hound)	--	--	--	40	85	90	100	110	110	110	110	110	115
TOTAL	2805	3445	4060	3070	3065	2840	2890	2600	595	530	560	635	740

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(S) By 1960, there were possibly as many as 3,800 transports in service of which only 10 percent consisted of the larger types. In 1964, about 20 percent of the total fleet of 3,200 planes were relatively long range types.

(S) Helicopters form part of the MATS complement. They were first acquired in 1954 when 50 were in service. Their numbers had grown to 1,200 in 1960 and to 1,700 in 1964.

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IV. MANPOWER AND OUTLAYS BY MISSION

A. Military Manpower

(S) The distribution of manpower by mission groups at four points in the period of coverage is shown in Table 8. The share of the General Purpose group was the highest throughout the period but the share declined from around 77 percent in 1952 to about 52 percent in 1964. The decline was experienced by all ground, naval, and air components of the General Purpose forces; it was most severe in the cases of ground and air components and least pronounced in the naval surface ship element. The Strategic Defense mission ranked second in manpower strength all through the years and slightly more than doubled its percentage of the total, from about 5 percent in 1952 to 14 percent in 1964. This rise was principally due to the advent of surface-to-air missiles in 1954 and the rapid increase in their deployment. The Strategic Attack mission grew ninefold during the period from the low level of less than one percent of total manpower in 1952 to nearly 9 percent in 1964. While the numbers of men in the bomber force declined slightly, the numbers in the land-based missile forces grew rapidly. The Military Air Transport mission's relative strength grew more than four times between 1952 and 1960 but declined slightly by 1964. All other military functions, that is, Command and General Support and the security troops possessed nearly one-fourth of military manpower in 1960 but lost ground by 1964 due to the diminution in the number of security troops.

B. Outlays by Mission (Figs. 3-4)

(S) The CIA data are set out by mission so that the growth and structure of mission outlays can be calculated directly. In this breakdown, all elements estimated by CIA are included and the totals are global in coverage.

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Table 8

DISTRIBUTION OF SOVIET MANPOWER BY MILITARY MISSION, 1952-1964 (U)

Mission	Number of Men (1000)				Percentage			
	1952	1954	1960	1964	1952	1954	1960	1964
<u>Strategic Attack</u>	<u>44</u>	<u>61</u>	<u>116</u>	<u>279</u>	<u>0.6</u>	<u>1.0</u>	<u>3.9</u>	<u>8.9</u>
Long Range	-	-	19	91	-	0.0	0.6	2.9
Peripheral	44	61	97	188	0.6	1.0	3.3	6.0
		(Non-Add)				(Non-Add)		
Bombers	44	61	64	59	0.6	1.0	2.2	1.9
Missiles: sea	-	0	3	7	-	0.0	*	0.2
: land	-	0	49	213	-	0.0	1.7	6.8
<u>Strategic Defense</u>	<u>332</u>	<u>371</u>	<u>345</u>	<u>431</u>	<u>4.9</u>	<u>6.5</u>	<u>11.7</u>	<u>13.7</u>
Fighters	100	138	125	111	1.5	2.4	4.2	3.5
AA Artillery	155	150	55	0	2.3	2.6	1.9	0.0
SAMs	-	4	82	226	-	0.1	2.8	7.2
Warning and Control	77	79	83	94	1.1	1.4	2.8	3.0
<u>General Purpose</u>	<u>5285</u>	<u>4266</u>	<u>1653</u>	<u>1624</u>	<u>77.3</u>	<u>74.7</u>	<u>56.1</u>	<u>51.6</u>
Ground Troops	4312	3236	1110	1120	63.0	56.6	37.6	35.6
Tactical Air	281	281	118	100	4.1	4.9	4.0	3.2
Naval: aviation	79	118	22	33	1.2	2.1	0.7	1.0
: ships	613	631	403	371	9.0	11.1	13.7	11.8
<u>Military Air Transport</u>	<u>67</u>	<u>75</u>	<u>126</u>	<u>123</u>	<u>1.0</u>	<u>1.3</u>	<u>4.3</u>	<u>3.9</u>
<u>All Other</u>	<u>1111</u>	<u>941</u>	<u>709</u>	<u>690</u>	<u>16.2</u>	<u>16.5</u>	<u>24.0</u>	<u>21.9</u>
TOTAL	6839	5714	2949	3150	100.0	100.0	100.0	100.0

Source: CIA, SCAM.

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(9) Total military expenditures declined against the previous year's level in the year of Stalin's death, by about 3 percent. In the next two years the aggregate rose 9 percent. This was the peak level of the period under review; the average outlay of the next five-year period was just below the 1953 mark and annual variations were comparatively small. Aggregate outlays were increased 4 percent in 1961 and 5 percent in 1962 and leveled off thereafter at just 4 percent over the base-year figure.

(9) The "stagnation" of Soviet military expenditures during the post-Stalin years is largely a result of the spectacular decline in Ground Mission outlays, only partially compensated by increases in other parts of the defense package. Ground outlays declined monotonically from 1957 to 1961 by an aggregate margin of 62 percent. Naval expenditures seemed to have some tendency to rise through 1955 but thereafter fell to an average level from 1957 to 1964 18 percent below that of 1953. Military Security Forces shrank uninterruptedly after 1952.

(8) On the other hand, CIA estimates military RDT&E expenditures as achieving steady and sizable growth, especially after 1955, with the 1963-1964 figures four and one-half times that of 1953. The increase in reserve and retired outlays is also monotonic but the aggregate change is considerably smaller, one-third comparing 1964 and 1953. The Strategic Attack mission, which was cut into between 1951 and 1953, jumped spectacularly in the next two years, by 150 percent. After a decline in 1956-1957 (by about one-quarter), growth resumed until 1962, when mission outlays are shown as 44 percent higher than in 1955 and 3.6 times greater than in 1953. Strategic Defense, in contrast, jumped by four-fifths in 1952-1953.

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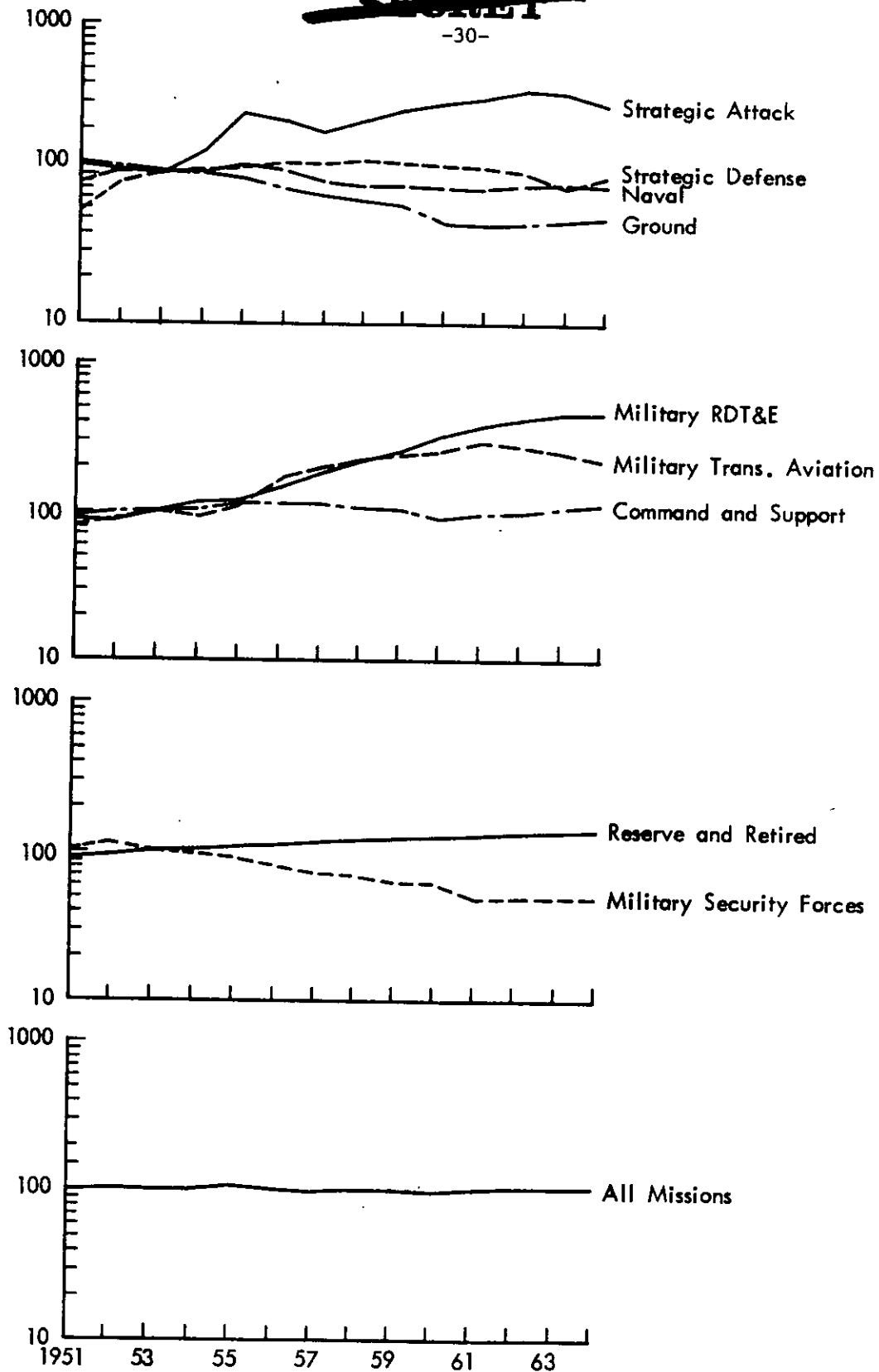
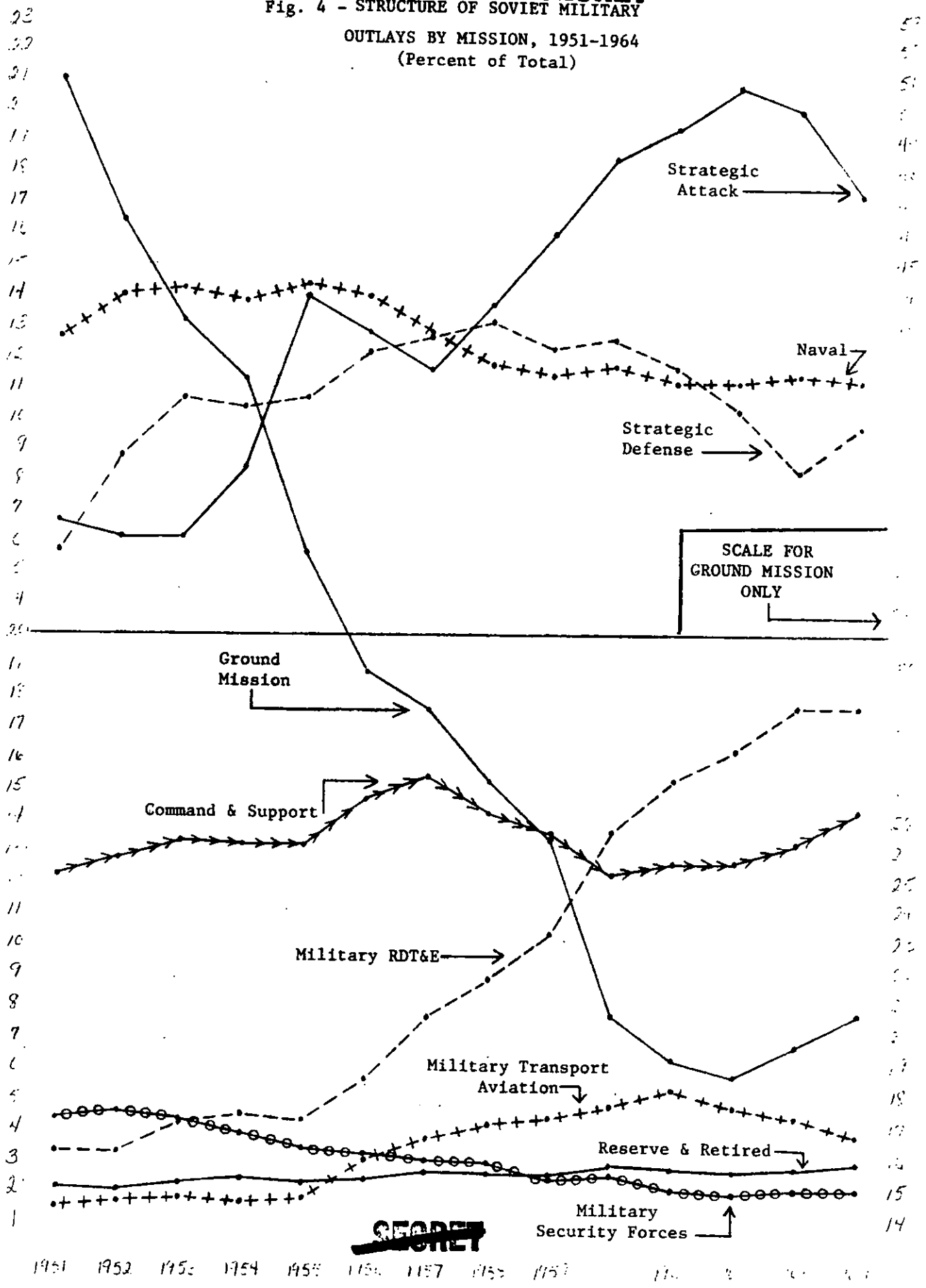


Fig. 3 — Indexes of Soviet Military Expenditures by Mission, 1951-1964 (U)
1953 = 100

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Fig. 4 - STRUCTURE OF SOVIET MILITARY
OUTLAYS BY MISSION, 1951-1964
(Percent of Total)



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Thereafter changes were smaller: outlays rose by 22 percent between 1953 and 1958, and then gradually dropped back to below the 1953 level by 1963. Large increases in Military Transport Aviation are shown between 1954 and 1961 (especially in 1956) followed by decreases thereafter. Initial steady growth of Command and Support outlays, until 1956, is followed by considerable fluctuation.

(S) As is to be expected from the growth description, three missions show the greatest changes in relative importance over the period. The Ground mission drops precipitously and without interruption through 1962, from over half of total outlays in 1951 to less than one-fifth in 1962.¹ RDT&E, on the other hand, accounted for something over 3 percent of total outlays in 1951 and climbed, especially after 1955, to a level of almost 18 percent of the total in 1963-1964. A particularly sharp increase is recorded for 1960. The share of expenditures on Strategic Attack moved up briskly between 1953 and 1955 (by 8 percentage points) and again, after a two-year and two and one-half point decline, between 1957 and 1962 (by 9 percentage points).

(S) For other missions the changes are smaller. Strategic Defense rose to a peak level of 13 percent of total outlays in 1958 compared with 6 percent in 1951, a movement which was composed of two sharper spurts in 1951-1953 and 1955-1957. By 1963 the shares had fallen back to a little over 8 percent of the total. The Naval mission exhibited some growth in relative weight to 1955 but then declined gently until 1964 (by about 3 points). Command and General Support outlays were a rising proportion of

¹(S) The absolute and relative drop in the Ground mission share is even larger than that of the service share, owing partly to the simultaneous decline in the importance of Tactical Air outlays, but also to the fact that the mission breakdown includes and the service breakdown excludes the rapidly growing RDT&E mission.

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the total to 1957, declined in the next three years, and then rose in 1961-1964. On the other hand, Military Transport Aviation outlays increased in relative significance after 1955, to a peak level of over 5 percent in 1961 from only 1 1/2 percent in 1951; in 1962-1964 the share dropped back to almost 4 percent. The share of outlays on reserve and retired personnel was slightly higher at the end of the period than at its beginning, and the relative weight of Military Security Forces declined in every year but two until 1962, losing more than half the original level of over 4 percent.

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V. OUTLAYS BY RESOURCE GROUP

(e) This distribution too is available in the CIA printout, so the growth and structure calculations can be made directly. The growth indexes are graphed in Figure 5 and reproduced in Part III of the Appendix Table.

(8) Operating outlays, which at the beginning of the period accounted for 60 percent of the total, were cut without interruption from 1952 to 1960, by almost a third. This was largely the effect of an even sharper drop in military personnel costs over the same period, by almost 50 percent. The effect on all operating expenditures was muted by increases in O&M outlays from 1951 to 1957 (26 percent over the six years). When these outlays also began to decline (1958-1960), the drop in all operating costs became steeper. Both personnel and O&M costs rose after 1960, resulting in a 16 percent recovery in total operating outlays.

(8) In investment expenditures (excluding RDT&E), procurement outweighs construction on the order of 10:1. Thus, the graphs of procurement and total investment virtually coincide. Moreover, construction growth differs little in pattern from that of procurement. From 1953, there appear to have been roughly two periods of growth in investment outlays. In the first, and shorter, 1953-1955, construction increased 16 and procurement 31 percent. Decline in the next two years brought procurement almost back to the 1953 level and construction below it. More sustained growth followed, lasting five years (until 1962), which brought both construction and procurement to levels about one-quarter above the 1953 mark. The 1963-1964 decline in procurement amounted to 11 percent, but the cut

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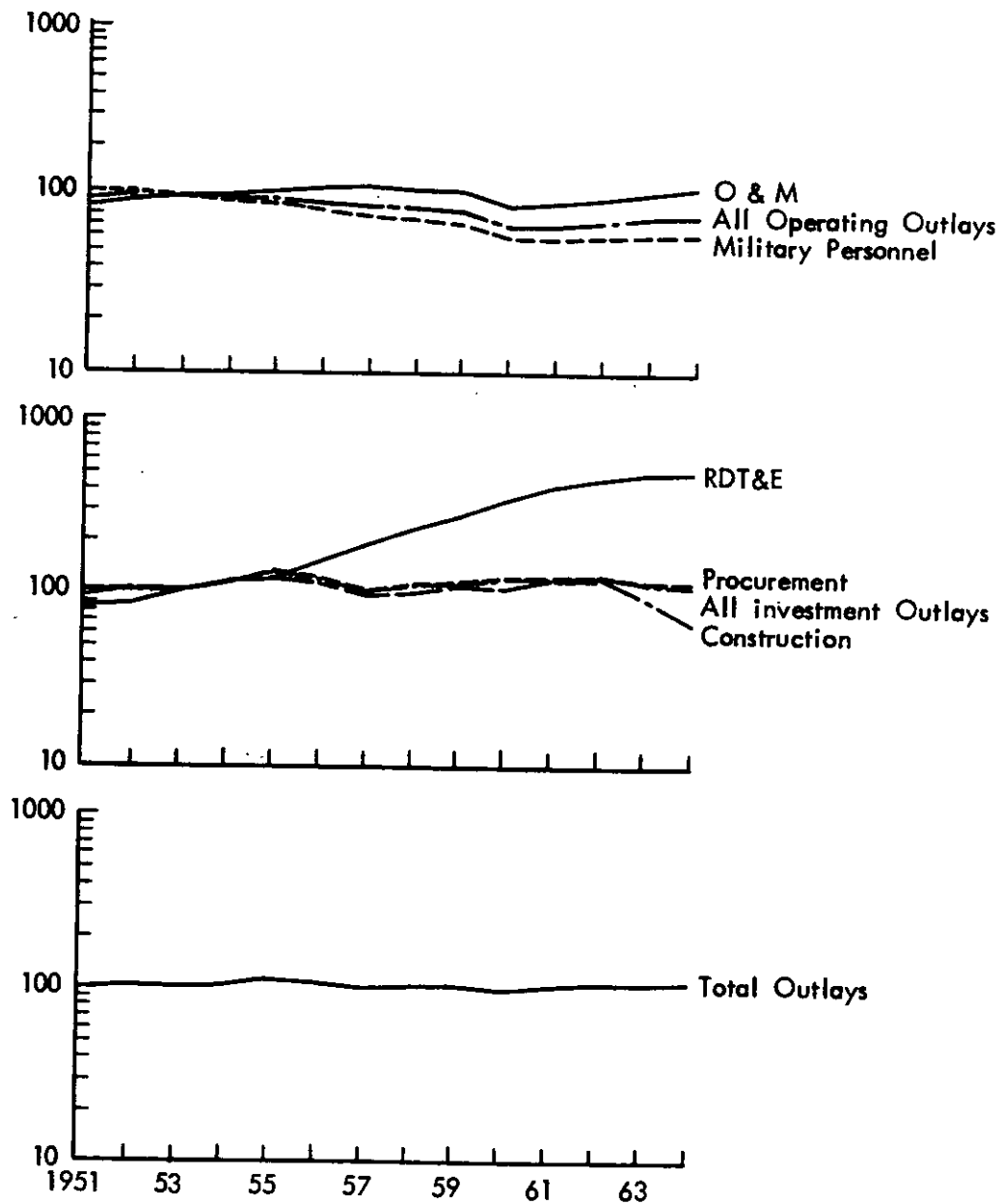


Fig. 5—Indexes of Soviet Military Expenditures by Resource Category, 1951-1964 (U)
1953 = 100

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in construction was almost 50 percent, resulting in a 15 percent drop in all investment.

(9) As was already noted under mission outlays, RDT&E grew steadily and rapidly in these years, reaching a level at the end of the period 5 to 6 times greater than at the beginning. However, because investment and operating outlays tended to grow in offsetting fashion, the swings in aggregate military expenditures are damped. Apart from 1955, in no year is the value of total military expenditures different from the 1953 base by more than 5 percentage points. With the general decrease in military personnel outlays tending to offset the steep rise in RDT&E, the average rate of growth of total expenditures is negative between 1953 and 1960, 1.9 percent between 1960 and 1964 and close to zero over the 11-year interval 1953-1964.

(9) Figures 6A and 6B picture the relatively dramatic changes in resource structure (percentage series in the Appendix Table). Outlays on military personnel as a proportion of total military expenditures exhibit a sweeping decade-long decline, falling from a level exceeding 42 percent in 1952 to just under 23 percent in 1962. The aggregate decrease is almost 50 percent. In sharp contrast, the share of RDT&E outlays was climbing rapidly from 1955 until 1964, jumping five and one-half times from 3 percent in 1951-1952 to 17 percent in 1963-1964.

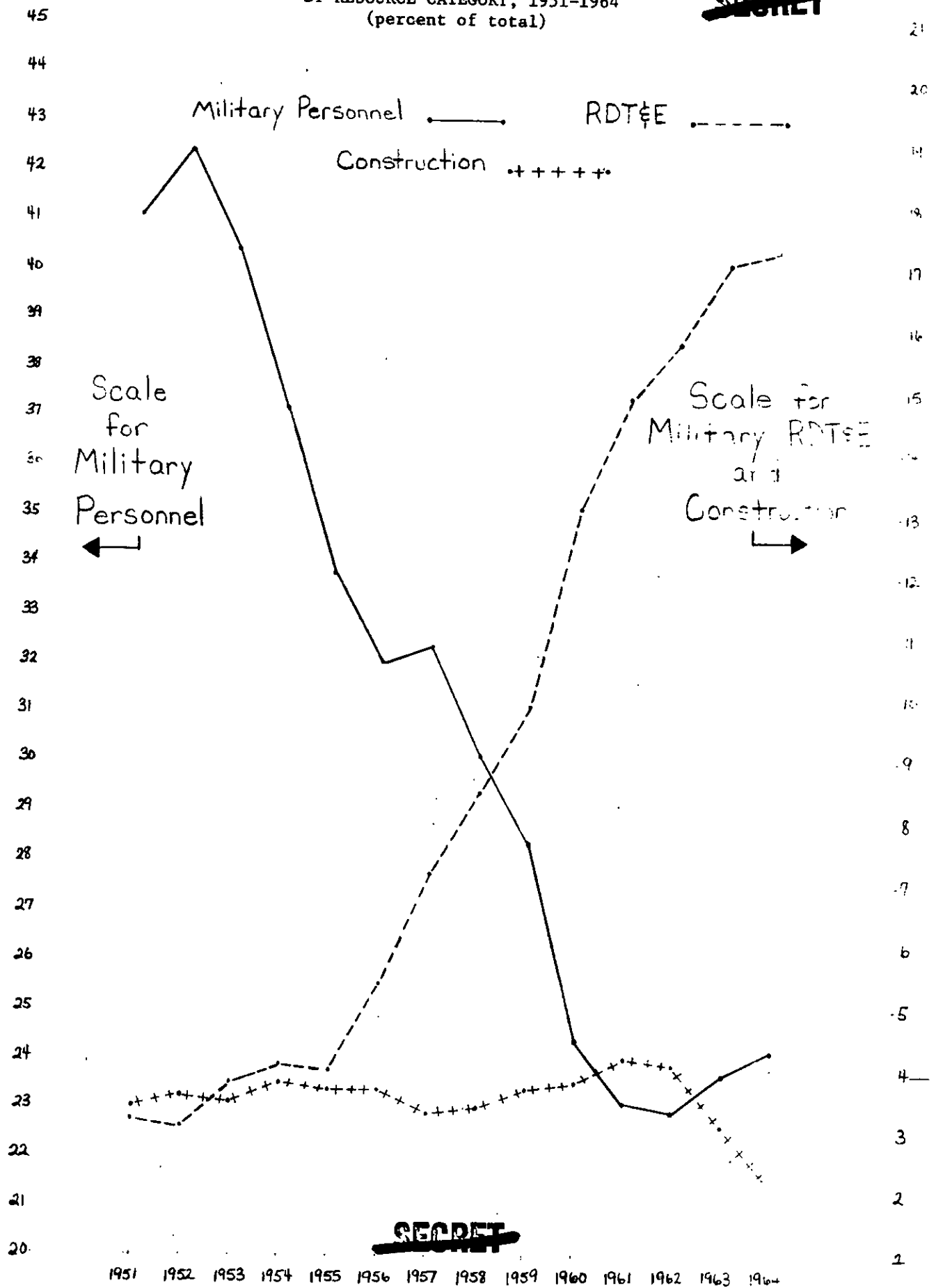
(9) On the other hand, the movement pattern for both procurement and O&M outlays is cyclical, procurement expenditures experiencing two cycles from 1952-1953 on, with peaks in 1955 and 1960, to only one or one and one-half in O&M, with a peak in 1957. In fact, after 1955, the procurement and O&M cycles seem to be inverse correlates. O&M's peak share in 1957

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Fig. 6A - STRUCTURE OF SOVIET MILITARY OUTLAYS
BY RESOURCE CATEGORY, 1951-1964
(percent of total)

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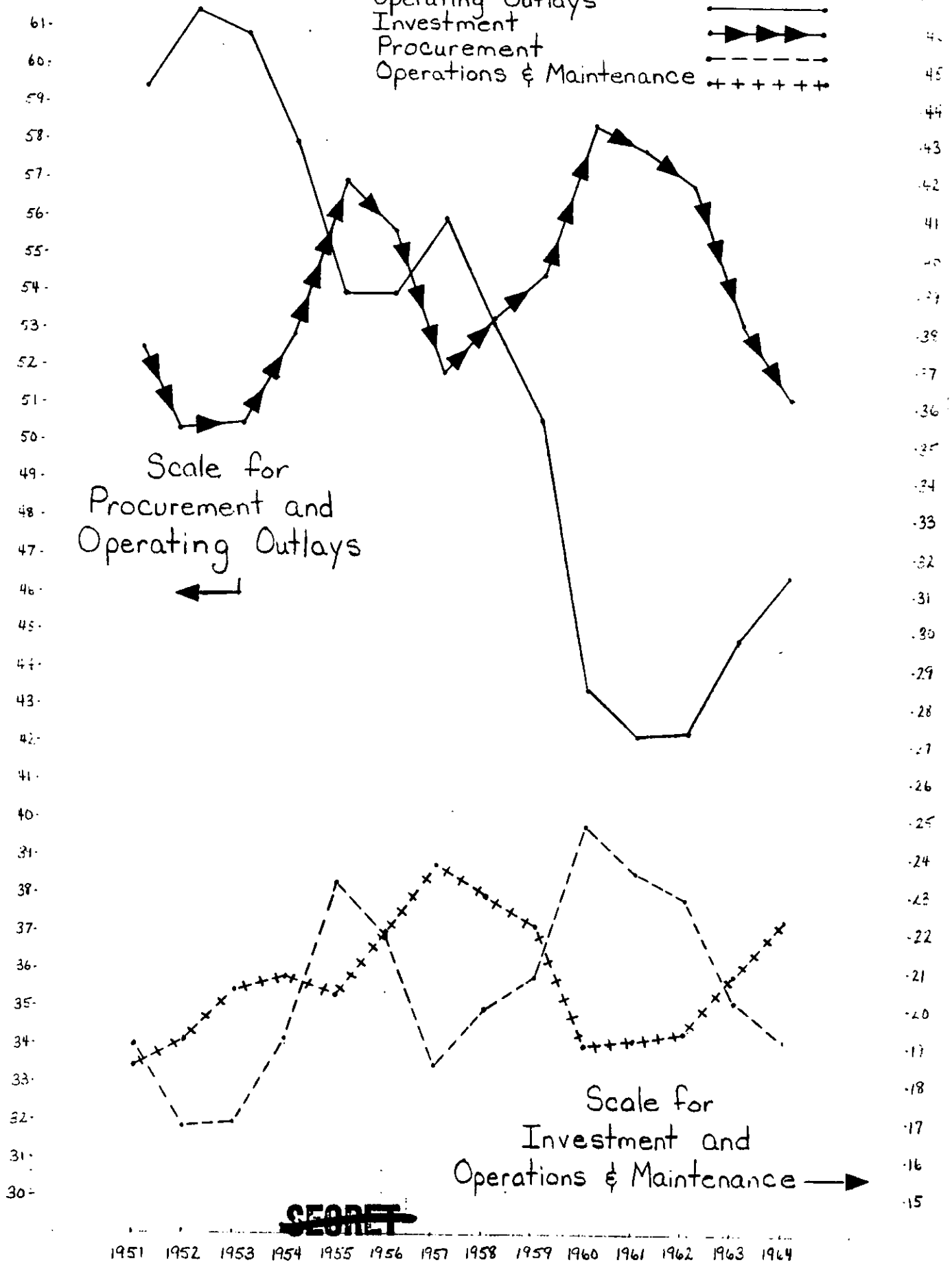


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Fig. 6B - STRUCTURE OF SOVIET MILITARY OUTLAYS
BY RESOURCE CATEGORY, 1951-1964
(percent of total)

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coincides with a procurement trough; the O&M trough occurs in 1960, the year of the second procurement peak; from 1960-1964 the procurement share is falling and that of O&M is rising. In this period, it is not R&D that is the competitor of procurement but O&M.

(2) If military personnel outlays are added to those on O&M and construction joined with procurement, we may compare the claims of all operating outlays against those on investment (excluding R&D). The pattern is similar with only some slight weakening of the inverse relation. In the immediate post-Stalin period, investment outlays (as well as RDT&E) were absorbing a growing proportion of the total defense pie and operating outlays a sharply declining share. The pattern was reversed between 1955 and 1957 (although personnel outlays declined further in 1956) but resumed again from 1957 to 1960. From 1960 or 1961 to 1964, operating outlays as a proportion of the total rose and the share of investment declined.

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VI. THE DISTRIBUTION OF RESEARCH AND DEVELOPMENT EFFORT

(U) The weaponry we have noted in Soviet forces, with its gradually evolving design and modernization, was the result of prior research and development activities occurring generally five years or more before deployment. It is of some interest, therefore, to take note of how the USSR has been allocating its research and development resources. Some rough analysis of this question has been made and the results are presented in Table 9. The calculations are based on dollar costs rather than rubles, which would be much preferable, but perhaps the trend and distribution are not too distorted by the enforced substitution. The analysis rests on the application not only of U.S. values but also of U.S. lead times, reckoning backward from the dates of the first deployment of Soviet weapons.

(U) Clearly the Soviet Union has bet heavily on the strategic offensive mission which has absorbed over half of R&D resources throughout the period considered. On an institutional basis, the Air and Rocket Forces have been the principal beneficiaries. The Air Force share of total R&D has declined while that of the Rocket Forces has increased with the shift from heavy bomber aircraft to the ICBM. Of interest is the greatly increased emphasis on defensive surface-to-air missiles. The share absorbed by defensive fighters has declined, but the absolute amounts of expenditures rose steadily. The strategic defensive mission as a whole has received increasing attention, as measured by its share of all R&D outlays, and accounted for around one-fifth of the total in 1960-1964. General purpose mission forces, after declining somewhat in relative importance between the first and second periods, began to gain again in the years 1960-1964. In this area, Army missiles, Air Force tactical fighters, and Naval surface ships experienced gains in relative standing. Noteworthy is the rapid

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Table 9

ESTIMATED SOVIET MILITARY AND SPACE RDT& E OUTLAYS BY MILITARY FUNCTION AND COMPONENT, SELECTED PERIODS, 1950-1964

	Indexes		Percent of Total		
	1950-54 = 100		Outlays each Period ^c		
	1955-59	1960-64	1950-54	1955-59	1960-64
I. By Function					
<u>Strategic Offensive</u>	<u>414</u>	<u>449</u>	<u>66</u>	<u>65</u>	<u>51</u>
Aircraft and ASM	100	91	38	9	6
Missiles, land-based	1357	1748	12	40	38
Missiles, sea-based	428	280	15	15	7
<u>Defensive</u>	<u>557</u>	<u>971</u>	<u>13</u>	<u>17</u>	<u>22</u>
AAA guns	170	400	-	-	-
SAM/ABM	1502	3069 ^b	3	10	16
Naval SAM	- ^a	376 ^b	0	-	1
Fighters/AAM	273	317	10	7	5
<u>General Purpose</u>	<u>276</u>	<u>444</u>	<u>16</u>	<u>11</u>	<u>12</u>
Army: rockets	1343	1538	-	1	1
missiles	346	2799	1	1	4
tanks, assault guns	467	213	-	-	-
Navy: surface ships	390	506	2	2	2
torpedo subs	157	88	9	3	1
Air Force: Tactical fighters/AAM	372	618	4	3	4
<u>Support</u>	<u>453</u>	<u>740</u>	<u>2</u>	<u>3</u>	<u>3</u>
Radar	303	216	1	1	-
Transports & Miscellaneous					
Aircraft	654	1539	1	2	3
Helicopters	300	51	1	-	-
<u>Space Systems</u>	<u>762</u>	<u>2519</u>	<u>3</u>	<u>5</u>	<u>12</u>
Launch systems	97	1419	2	-	4
Vehicles	1672 ^a	2189	1	4	4
Launch operations		1036	0	1	4
All RDT&E	421	580	100	100	100

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Table 9 (Cont'd.)

	Indexes 1950-54 = 100		Percent of Total Outlays each Period ^c		
	1955-59	1960-64	1950-54	1955-59	1960-64
II. <u>By Component</u>					
<u>Army</u>	<u>512</u>	<u>1864</u>	<u>2</u>	<u>2</u>	<u>5</u>
Tanks and assault guns	467	213	-	-	-
AA guns	170	400	-	-	-
Rockets	1343	1538	-	1	1
Missiles	346	2799	1	1	4
<u>Navy</u>	<u>340</u>	<u>254</u>	<u>26</u>	<u>21</u>	<u>11</u>
Surface ships	390	506	2	2	2
Missile subs & missiles	428	280	15	15	7
Other subs	157 ^a	88 ^b	9	3	1
SAMs		376 ^b	0	-	1
<u>Air Forces</u>	<u>225</u>	<u>328</u>	<u>55</u>	<u>30</u>	<u>31</u>
Longe range air	100	91	38	9	6
Tactical air	372	618	4	3	4
PVO-aircraft	273	317	10	7	5
PVO-SAMs	1502	3069	3	10	16
<u>Rocket Forces</u>	<u>1357</u>	<u>1748</u>	<u>12</u>	<u>40</u>	<u>38</u>
<u>Space Ministries</u>	<u>762</u>	<u>2519</u>	<u>3</u>	<u>5</u>	<u>12</u>
<u>Other</u>	<u>453</u>	<u>740</u>	<u>2</u>	<u>3</u>	<u>3</u>
All RDT&E	421	580	100	100	100

^aValue in 1950-54 is zero.

^b1960-64 as percent of 1955-59.

^cDiscrepancies between totals and sums of components are due to rounding.

"-" means less than 1/2 of 1 percent.

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increase in emphasis received by the Rocket Forces and its predecessor organizations.

(U) With respect to the institutional distribution of R&D outlays, the decline in the shares of the Air Force and the Navy, the heavy emphasis on the Rocket Forces, and the increasing attention given the ministries for space activities are of note. The Army, never a large claimant of R&D funds, nevertheless improved its relative position in 1960-1964 as a result of its work on missiles.

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VII. CONCLUSIONS

(S) The period 1952-1964 brought the USSR a strategic offense capability of intercontinental range in the triad of long range bombers, ICBMs and SLBMs. But an equally noteworthy feature of the period is the declining level of aggregate military expenditures. This largely reflects a sharp cut in military manpower and therefore of military personnel costs, offsetting a sharply increased growth of RDT&E outlays as well as some increases in procurement expenditures.

(S) Within the constrained outlay totals, the relative importance of the Ground Forces declined precipitously, largely in favor of PVO and the SRF (or the elements out of which the designated organizations were subsequently created). The Navy held its own with significant expansion of the fleet of modern submarines. In the Air Force, the all-weather fighter was introduced in increasing numbers.

(U) All the services and forces benefited from modernization during this period of rapidly rising R&D, with Strategic Offense apparently receiving the greatest share of resources.

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Appendix Table

STRUCTURE AND GROWTH OF SOVIET MILITARY EXPENDITURES, 1951-1964

I. Distribution By Service

	A. In Percent of Total Outlays in Each Year ^a													
	1951	1952	1953	1954	1955	1956	1957	1958	1959	1960	1961	1962	1963	1964
1. Ground Forces	40.1	40.9	37.5	32.7	30.7	27.6	27.3	24.6	24.2	18.0	17.3	17.2	17.9	18.8
2. SRF	--	--	--	--	.2	.8	2.3	5.7	9.4	13.8	16.3	18.3	17.2	12.9
3. PVO Strany	6.5	9.9	11.9	11.8	11.8	13.8	14.6	15.4	14.7	15.7	14.6	13.0	10.9	12.6
4. Air Forces														
a. LRA	7.5	6.8	6.8	9.5	15.4	13.3	10.1	9.0	7.5	6.8	6.2	7.0	8.0	8.7
b. Tactical Aviation	16.7	11.0	10.8	13.6	9.0	8.3	8.0	8.6	7.3	7.7	6.8	6.7	7.5	8.0
c. Military Transport Aviation	1.6	1.8	2.1	1.9	2.0	3.4	4.2	4.9	5.1	5.9	6.7	6.1	5.7	5.0
d. Total	25.8	19.5	19.6	25.0	26.5	25.0	22.3	22.4	19.9	20.4	19.7	19.8	21.2	21.7
5. Navy														
a. Strategic Forces	--	--	--	--	.1	.4	1.0	1.4	2.1	2.4	2.0	1.3	.7	.9
b. Other	14.0	15.6	15.9	15.7	16.0	15.8	14.6	13.9	13.7	14.6	14.2	14.3	15.0	14.5
c. Total	14.0	15.6	15.9	15.7	16.1	16.2	15.6	15.3	15.8	17.0	16.1	15.6	15.7	15.3
6. Command & Support	13.6	14.2	15.0	14.9	14.8	16.6	17.9	16.7	16.1	15.2	15.9	16.2	17.2	18.6
TOTAL SIX SERVICES ^b	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
B. Index Numbers, 1953 = 100														
1. Ground Forces	106.9	113.2	100.0	88.7	90.0	75.4	68.7	62.2	61.1	41.8	41.2	42.6	42.8	45.2
2. SRF ^c	--	--	--	--	8.3	38.9	100.0	247.2	408.3	550.0	669.4	780.6	708.3	533.3
3. PVO Strany	54.8	85.8	100.0	100.5	108.6	118.3	115.2	122.3	116.8	114.2	100.6	101.5	82.2	95.4
4. Air Forces														
a. LRA	110.7	103.6	100.0	142.9	250.0	201.8	140.2	125.0	105.4	87.5	81.3	95.5	105.4	115.2
b. Tactical Aviation	155.1	105.6	100.0	128.7	92.1	79.2	70.2	75.3	64.0	61.8	56.7	57.9	62.9	66.9
c. Military Transport Aviation	79.4	88.2	100.0	91.2	105.9	167.6	194.1	223.5	235.3	250.0	291.2	273.5	250.0	217.6
d. Total	131.8	103.1	100.0	129.6	148.1	130.9	107.4	108.0	96.3	90.4	89.8	93.5	97.2	99.4
5. Navy														
a. Strategic Forces ^c	--	--	--	--	6.7	46.7	100.0	146.7	220.0	226.7	193.3	133.3	73.3	86.7
b. Other	87.8	101.9	100.0	100.0	110.6	101.9	86.7	82.5	81.4	79.8	79.5	83.3	84.4	81.7
c. Total	87.8	101.9	100.0	100.0	111.0	104.6	92.4	90.9	93.9	92.8	90.5	90.9	88.6	86.7
6. Command & Support	91.1	98.8	100.0	101.2	108.5	113.8	113.0	106.1	102.0	88.7	95.1	100.4	103.6	111.7
TOTAL SIX SERVICES	100.2	104.0	100.0	101.8	109.9	102.7	94.4	94.8	94.8	87.1	89.5	93.0	90.0	90.1

^aExcluding military RDT&E, DOSAAF support, military security forces, reserve and retired personnel.

^bDiscrepancies between totals and sums of components are due to rounding.

^c1957 = 100

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Appendix Table

STRUCTURE AND GROWTH OF SOVIET MILITARY EXPENDITURES, 1951-1964

II. Distribution By Mission

	A. In Percent of Total Outlays in Each Year													
	1951	1952	1953	1954	1955	1956	1957	1958	1959	1960	1961	1962	1963	1964
1. Strategic Attack	6.7	6.1	6.1	8.5	14.0	12.9	11.6	13.8	16.0	18.5	19.5	20.9	20.0	17.4
2. Strategic Defense	5.9	8.8	10.6	10.5	10.6	12.1	12.6	13.1	12.4	12.6	11.6	10.3	8.4	9.8
3. Ground	51.0	46.5	43.1	41.3	35.7	31.8	30.6	28.3	26.5	20.7	19.2	18.8	19.6	20.7
4. Naval	12.6	14.0	14.2	13.9	14.4	14.0	12.7	11.8	11.5	11.8	11.2	11.2	11.5	11.2
5. Military Transport Aviation	1.5	1.6	1.8	1.6	1.8	3.0	3.7	4.1	4.3	4.8	5.3	4.8	4.4	3.8
6. Military RDT&E	3.4	3.4	4.1	4.5	4.3	5.7	7.6	8.9	10.3	13.6	15.3	16.3	17.7	17.7
7. Command & Support	12.2	12.8	13.4	13.3	13.3	14.7	15.5	14.3	13.6	12.3	12.6	12.7	13.3	14.3
8. DOSAAF	.3	.3	.3	.3	.2	.3	.3	.3	.3	.3	.3	.3	.3	.3
9. Military Security Forces	4.4	4.6	4.2	3.9	3.5	3.2	3.0	2.9	2.5	2.6	2.0	1.9	2.0	2.0
10. Reserve & Retired	2.1	2.0	2.2	2.3	2.2	2.3	2.6	2.6	2.6	2.9	2.8	2.7	2.8	2.9
ALL MISSIONS ^a	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
	B. Index Numbers 1953 = 100													
	1951	1952	1953	1954	1955	1956	1957	1958	1959	1960	1961	1962	1963	1964
1. Strategic Attack	110.7	103.6	100.0	142.9	252.7	221.4	185.7	225.9	265.2	293.8	323.2	363.4	343.8	298.2
2. Strategic Defense	54.8	85.8	100.0	100.5	108.6	118.3	115.2	122.3	116.8	114.2	109.6	101.5	82.2	95.4
3. Ground	117.7	111.5	100.0	97.6	90.5	76.4	69.1	65.1	61.7	46.3	44.7	46.0	47.3	49.9
4. Naval	87.8	101.9	100.0	100.0	110.6	101.9	86.7	82.5	81.4	79.8	79.5	83.3	84.4	81.7
5. Military Transport Aviation	79.4	88.2	100.0	91.2	105.9	167.6	194.1	223.5	235.3	250.0	291.2	273.5	250.0	217.6
6. Military RDT&E	84.0	86.7	100.0	112.0	116.0	145.3	181.3	217.3	256.0	322.7	380.0	424.0	453.3	454.7
7. Command & Support	91.1	98.8	100.0	101.2	108.5	113.8	113.0	106.1	102.0	88.7	95.1	100.4	103.6	111.7
8. DOSAAF	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
9. Military Security Forces	102.6	112.8	100.0	94.9	89.7	79.5	69.2	67.9	59.0	59.0	48.7	48.7	48.7	48.7
10. Reserve and Retired	92.7	95.1	100.0	102.4	107.3	109.8	114.6	117.1	119.5	124.4	126.8	129.3	131.7	134.1
ALL MISSIONS	99.4	103.4	100.0	101.9	109.1	103.6	97.3	99.2	100.4	96.2	100.4	105.4	104.1	104.0

^aDiscrepancies between totals and sums of components are due to rounding.

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Appendix Table

STRUCTURE AND GROWTH OF SOVIET MILITARY EXPENDITURES, 1951-1964

III. Distribution By Resource Category

	A. In Percent of Total Outlays in Each Year													
	1951	1952	1953	1954	1955	1956	1957	1958	1959	1960	1961	1962	1963	1964
1. Military Personnel	41.1	42.4	40.4	37.2	33.8	32.0	32.3	30.1	28.4	24.3	23.1	22.9	23.7	24.2
2. Operations and Maintenance	18.4	19.1	20.4	20.7	20.3	22.0	23.7	23.0	22.2	19.0	19.1	19.3	20.9	22.3
ALL OPERATING OUTLAYS	59.5	61.5	60.9	58.0	54.0	54.0	56.0	53.2	50.6	43.4	42.2	42.3	44.7	46.5
3. Procurement	34.0	31.8	31.9	34.1	38.3	36.9	33.5	35.0	35.8	39.8	38.6	37.9	35.1	34.1
4. Construction	3.4	3.6	3.5	3.8	3.7	3.7	3.3	3.4	3.7	3.8	4.2	4.1	3.1	2.2
ALL INVESTMENT OUTLAYS	37.4	35.3	35.4	37.9	42.0	40.6	36.8	38.3	39.5	43.5	42.8	41.9	38.2	36.2
5. Military RDT&E	3.2	3.1	3.8	4.1	4.0	5.4	7.2	8.5	9.9	13.1	14.9	15.8	17.1	17.3
TOTAL OUTLAYS ^a	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
	B. Index Numbers, 1953 = 100													
	1951	1952	1953	1954	1955	1956	1957	1958	1959	1960	1961	1962	1963	1964
1. Military Personnel	100.9	108.4	100.0	93.9	91.3	82.0	77.7	73.9	70.5	57.9	57.5	59.8	61.1	62.3
2. Operations and Maintenance	89.4	96.8	100.0	103.4	108.2	111.6	113.0	111.9	109.3	89.7	93.9	99.7	106.3	113.5
ALL OPERATING OUTLAYS	97.1	104.5	100.0	97.1	96.9	91.9	89.5	86.7	83.3	68.6	69.7	73.2	76.4	79.5
3. Procurement	105.9	103.1	100.0	109.2	130.8	119.8	102.2	109.0	112.7	120.0	121.5	125.1	114.4	111.2
4. Construction	98.4	106.3	100.0	110.9	115.6	110.9	93.8	96.9	106.3	104.7	121.9	123.4	92.2	65.6
ALL INVESTMENT OUTLAYS	105.0	103.4	100.0	109.3	129.5	119.0	101.4	107.6	112.1	118.5	121.7	124.9	112.4	106.6
5. Military RDT&E	82.9	85.7	100.0	111.4	115.7	147.1	184.3	222.9	262.9	332.9	395.7	440.0	471.4	474.3
TOTAL OUTLAYS	99.4	103.4	100.0	101.9	109.1	103.6	97.3	99.2	100.4	96.2	100.4	105.4	104.1	104.0

^aDiscrepancies between totals and sums of components are due to rounding.

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