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US - USSR  
Strategic Offensive Nuclear Forces  
1946 - 1987

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## INTRODUCTION

A regular element of the debate about nuclear weapons and arms control is the presentation of data on the relative levels of US and USSR strategic forces, often in the form of tables or charts. Frequently, the data presented is unclear in terms of where it came from or what assumptions were used to construct it. Some tables present current "total" forces, others "on-line" forces, "alert" forces, "generated alert" forces, or "SALT accountable" forces. Each is important and more usable if detail about the sources and assumptions is provided. Historical tables compound the difficulties by not always being explicit about the time of the year (i.e. beginning Fiscal Year, beginning calendar year, or some other time).

There has long been a need for an accurate, comprehensive and consistent accounting of the growth and composition of U.S. and Soviet strategic nuclear forces. Such an accounting can provide a context for policy decisions, allow for better assessments of current force levels and trends, and enrich historical accounts of the nuclear age.

This Working Paper reflects a preliminary attempt to assemble accurate numbers through the eight tables and seven figures presented below.<sup>1</sup> The Tables depict US and USSR bomber forces, intercontinental ballistic missile forces, and submarine-launched ballistic missile forces and the weapons they carry

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<sup>1</sup> The material in this Working Paper is excerpted from sections of the Nuclear Weapons Databook, Volume I, U.S. Forces and Capabilities, 2nd edition (forthcoming) and Volume IV, Soviet Nuclear Weapons, (forthcoming). Reader's additions and corrections are appreciated.

year-by-year from 1946 to 1987. In order to avoid any confusion in the presentation of the information Tables 3 through 8 have extensive footnotes which identify and clarify the assumptions which have been made. In addition, we have prepared seven Figures which present the data in a visual and comparative way.

The Tables and Figures in this Working Paper depict strategic offensive "force levels," that is, "on-line" missile launchers as well as those in overhaul, repair, conversion, and modernization. They do not include non-operational test missiles or test launchers, or spare missiles (either maintenance spares or reloads). Bomber figures include U.S. FB-111A medium bombers which are accountable under the SALT treaties. Soviet Backfire bombers are not included, both because they are considered to have theater roles and they are not included as strategic forces under the SALT treaties. U.S. bomber figures do not include the several hundred SALT-accountable B-52 bombers which are not operational and in storage at Davis-Monthan Air Force Base, Arizona. The Tables do not depict strategic defensive forces, which are anti-ballistic missile systems, surface-to-air missiles, interceptor aircraft and air-to-air missiles. The Tables do not depict those weapons capable of striking the homelands of the US or USSR but are not included in strategic war plans or were the subject of SALT negotiations. These would include such weapons as sea-launched and ground launched cruise missiles, IRBMs, and aircraft weapons aboard aircraft carriers

which were a part of strategic nuclear war plans in the 1950s and of several Single Integrated Operational Plans (SIOP).

It is important to distinguish between force levels and alert forces. Alert forces are those missiles that could, under normal conditions, be fired within a matter of minutes or in the case of bombers could be airborne within approximately fifteen minutes. In peacetime the US keeps its strategic forces at much higher states of alert than the Soviet Union. For the US, alert forces comprise approximately two-thirds of on-line forces. These include virtually all on-line ICBMs, 60 percent of on-line strategic submarines and SLBMs, and 30 percent of the Primary Authorized Aircraft (PAA) bomber force. Currently US bomber weapons on alert constitute about 36 percent of the total weapons on alert, with 33 percent on strategic submarines and 31 percent on ICBMs. In the case of strategic submarines it is also important to distinguish between alert forces and modified alert forces. In the case of the 60-65 percent of the submarines that are at sea, about one-half of those constitute the alert force and could launch in a few minutes. The other half at sea are in a modified alert status, going to or coming from their designated areas, but still capable of launching missiles in a matter of hours.<sup>2</sup>

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<sup>2</sup> SASC, FY 1984 DOD, Part 5, p. 2504; Donald R. Cotter, "Peacetime Operations: Safety and Security," in Ashton Carter, John D. Steinbruner, Charles A. Zraket, eds., Managing Nuclear Operations (Washington, D.C.: The Brookings Institution, 1987), p. 25.

The Soviet strategic bomber force is not kept on alert. Instead the Soviets rely on the "generated alert" since they believe that there will be time to launch or disperse bombers. More than 80 percent of Soviet ICBMs are on alert,<sup>3</sup> and could be fired within minutes.<sup>4</sup> The Soviet Union keeps only about 15 to 20 percent of its strategic submarines and SLBM force at sea at any given time. Another 15 to 20 percent of the alert SSBN force are dockside with missiles capable of reaching targets in the U.S. from the Northern and Pacific Fleet bases. If time permitted a larger number of SSBNs could be flushed from their homeports.

As more strategic weapons have been deployed, the corresponding number on alert also has gone up. It is estimated that in 1987 approximately 7,250 U.S. strategic weapons were on alert, an increase of over 2,100 since 1981. In recent years the number of US ICBM warheads has remained fairly constant but has been a decreasing percentage of the total forces on alert. The most significant increases have come in bomber weapons with over 1,600 air-launched cruise missiles (ALCMs) deployed on B-52G/H bombers. Soviet strategic forces have also increased significantly as ICBMs and SLBMs have been MIRVed.

#### SOURCES OF INFORMATION

US government documents provide most of the data in this Working Paper, both for the US and the USSR. It should be noted

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<sup>3</sup> Stephen M. Meyer, "Soviet Nuclear Operations," in Carter, et. al., Managing Nuclear Operations, p. 494.

<sup>4</sup> Ibid., p. 495.

that different US departments and agencies often disagree and, therefore, variations in their estimates occur. The reasons for this has to do with security classification, different counting standards, and inter agency politics.

The data on the USSR is, obviously, more tentative. The Soviet Union provides virtually no information about its own military forces, a situation that has so far remained unchanged with the new openness (glasnost) of the Gorbachev era. During the infrequent times that Soviet authors do divulge empirical information about their military forces, it is virtually always based on western sources.

Within the US government, there is not an empirical "truth" about the composition and characteristics of Soviet forces. The information divulged by the Department of Defense or the agencies of the intelligence community -- the intelligence components of each of the military services, the National Security Agency, the CIA, the Department of Energy -- reflect estimates of Soviet forces, and as such often reflect different biases or quality of information. By necessity we have had to make judgments about what appears to us to be the most accurate information.

The Department of Defense's Annual Report to Congress between 1967 and 1981 provided a continuing source of information comparing US and Soviet strategic forces. The Reagan Administration has not included the tables in its 1982 to 1987 Annual Reports. The earlier volumes included estimates of nuclear

warheads in the bomber and missile forces of the two countries (see below).

It is worth noting that the Department of Defense's estimates and those included here are often at variance. Without exception, DOD's estimates for both the US and the USSR are lower than those presented here. There are several reasons for this.

The Department of Defense estimates of US and Soviet strategic forces are unclassified estimates. Classified estimates, most likely, have higher figures for both sides but are not divulged for the purported reason that they would compromise "sources and methods" of intelligence collection about

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US-Soviet Strategic Force Warheads

<u>DATE</u>	<u>US</u>	<u>USSR</u>
1 Oct 1967	4500	1000
1 Sep 1968	4200	1100
1 Sep 1969	4200	1350
30 Dec 1970	4000	1800
1 Nov 1971	4700	2100
mid - 1972	5700	2500
mid - 1973	6784	2200
mid - 1974	7650	2500
mid - 1975	8500	2500
mid - 1976	8900	3500
30 Sep 1977	8400	3300
1 Jan 1978	9000	4000+
1 Jan 1979	9200	5000
1 Jan 1980	9200	6000
1 Jan 1981	9000	7000

Based upon Annual Reports of the Department of Defense for Fiscal Years 1969 through Fiscal Year 1982.

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the USSR or reveal features of US nuclear war plans that should not be made public.

For example, the Annual Report's numbers for the US do not reflect the true total of strategic nuclear forces available to the national command authorities. The Department of Defense estimate of the number of US bomber weapons is less than our estimate. In fact the true number of bomber weapons in the inventory exceeds our estimate. Bomber weapons, of many types, with different weights, sizes, and explosive yields, have been assigned in great numbers to the bomber force since the mid-1950s. Individual bombers can and do carry a great variety of different kinds and numbers of weapons. Their exact loadings are determined by their role in executing the war plan. The loading of the entire force is extraordinarily complex. To reveal the true number of weapons available to the bomber force, thus, would in the Department of Defense's opinion, reveal too much about the war plans.

The US bomber force is broken into two categories: the approximately thirty percent on alert and the rest non-alert. Each alert bombers is estimated to be loaded with an average of approximately 22 nuclear weapons. The logic is to put as many weapons in the air as fast as possible so they would not be destroyed on the ground. Another reason why our estimates are larger than the unclassified Department of Defense estimates has to do with the design characteristics of nuclear bombs/warheads. The design of early nuclear and thermonuclear bombs was such that

they could only be exploded at one yield. (Beginning in the 1960s bombs were developed that provided "selectable" or variable yields.) Because there were many different targeting options in the war plans there was a "need" for many bombs per bomber. The normal military practice of planning for every contingency resulted in a large bomb stockpile requiring many different types of single yield bombs. The introduction of variable yield bombs allowed for targeting flexibility with fewer numbers of bombs.

Another reason why our estimates are larger than unclassified Department of Defense estimates has to do with "reserve" weapons, for bombers and possibly missiles. Reserve weapons would be for restrike operations. Bombers would return to recovery bases after dropping their initial loads, and theoretically would be loaded for another sortie. The US may even have contingency plans for strategic submarines to rendezvous with submarine tenders at prearranged places to reload missiles and warheads.

While the true number of weapons that exist to cover every contingency is larger than most estimates the true number available at any given time is usually smaller. For example in the early 1960s, the US introduced a communications system, called the Emergency Rocket Communications System (ERCS), which placed a radio transmitter, rather than a nuclear warhead atop ten Minuteman II missiles. These missiles could be fired and used as emergency broadcast systems during a nuclear war to transmit launch orders to US forces. The ten ERCS missiles remain deployed

today at Whiteman Air Force Base, Missouri. Our Table reflects ten fewer Minuteman II warheads than missiles.

On the other hand we have not reduced the numbers to reflect the true operational status of the forces. At any given time some percentage of US and Soviet ICBMs are undergoing maintenance, modifications or conversion and are not operational, i.e. off-line. The number may range from less than a dozen to several dozen at any one time. The real number available to launch is constantly changing and is less than the numbers reflected in the tables below. Similarly at any given time some number of US and Soviet strategic submarines are in overhaul or undergoing modifications or retrofitting which take them out of service for some period of time. For the U.S. this number is normally about four or five submarines on average, for the Soviets the number is approximately eight to ten submarines.

Other unknown operational factors would give lesser warhead totals. Because we are not certain, (nor is the US intelligence community), of exactly how many warheads are carried on the Soviet MIRVed ICBM force we assume the number of warheads the missile could carry or use the SALT limit. It is unlikely that every Soviet ICBM carries the maximum number of reentry vehicles for which it is capable.

Soviet reserve warheads are another area of uncertainty. Some unknown number of reserve warheads and bombs undoubtedly exist for Soviet forces, as they do for US forces. The Soviet Union has apparently practiced and has some capability to reload

ICBMs into cold launched silos,<sup>5</sup> though the possibility of it doing so in the midst of a nuclear war seems low. The Department of Defense also says that Soviet "Resupply systems are available to reload SSBNs [strategic missile launching submarines] in protected waters."<sup>6</sup> It is unknown whether the Soviet Union has any reload or restrike bombs for its strategic bombers.

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<sup>5</sup> "For their ICBM, LRINF, SRINF, SNF, SLBM, and air defense forces, the Soviets have stocked extra missiles, propellants and warheads throughout the USSR. Some ICBM silo launchers could be reloaded, and provision has been made for the decontamination of those launchers. Plans for the survival of necessary equipment and personnel have been developed and practiced;" Soviet Military Power, 1987, p. 28. Similar statements can be found in earlier editions: Soviet Military Power, 1984, p. 21; Soviet Military Power, 1985, p. 28; and Soviet Military Power, 1986, p. 24.

<sup>6</sup> SMP, 1987, p. 28. Missile Transport and Submarine Support Ships would probably be used. See Norman Polmar, Guide to the Soviet Navy, fourth edition (Annapolis, Maryland: Naval Institute Press, 1986) pp. 273-77, 293-97.

## DEFINITIONS

**Alert Forces:** "On-line" strategic weapons which have a day-to-day readiness to launch within a short period of time (see also Generated Alert).

**Bomber:** Strategic airplane capable of long-range, intercontinental missions (designed for a tactical operating radius of over 2,500 nautical miles at design gross weight and design bomb load).

**Force loadings:** Those independently targetable weapons associated with the total operational ICBMs, SLBMs, and long-range bombers.

**Generated Alert:** Strategic weapons brought to a higher level of readiness than day-to-day alert forces.

**Intercontinental Ballistic Missile (ICBM):** Strategic missile with a range capability from about 3,000 to 8,000 nautical miles.

**On-line:** Those nuclear weapons which are operational, that is, not undergoing maintenance, modifications or conversions which remove them from the operational force for any period of time.

**Strategic Nuclear Powered Ballistic Missile Submarine (SSBN):** Fleet ballistic missile submarine capable of launching long-range missiles from either a submerged or surfaced conditions.

**Strategic Offensive Forces:** Bombers, Intercontinental Ballistic Missiles, and Submarine Launched Ballistic Missiles accountable under the SALT Agreements.

**Submarine-launched Ballistic Missile (SLBM):** Ballistic missile capable of being launched from fleet ballistic missile submarines.

Table 1  
U.S. Strategic Offensive Force Loadings, 1946-1987

End Year	ICBMs		SLBMs		Bombers		Totals	
	<u>Lncher</u>	<u>Warhead</u>	<u>Lncher</u>	<u>Warhead</u>	<u>Lncher</u>	<u>Warhead</u>	<u>Lncher</u>	<u>Warhead</u>
1946					125	9	125	9
1947					270	13	270	13
1948					473	50	473	50
1949					447	200	447	200
1950					462	400	462	400
1951					569	569	569	569
1952					660	660	660	660
1953					720	878	720	878
1954					1035	1418	1035	1418
1955					1260	1755	1260	1755
1956					1470	2123	1470	2123
1957					1605	2460	1605	2460
1958					1620	2610	1620	2610
1959	6	6			1545	2490	1551	2496
1960	12	12	32	32	1515	3083	1559	3127
1961	57	57	80	80	1395	2973	1532	3110
1962	203	203	144	144	1306	2920	1653	3267
1963	597	597	160	160	1055	2855	1812	3612
1964	907	907	320	320	785	2953	2012	4180
1965	854	854	384	384	650	3013	1888	4251
1966	1004	1004	560	560	575	3043	2139	4607
1967	1054	1044	656	656	558	3192	2268	4892
1968	1054	1044	656	656	481	3139	2191	4839
1969	1054	1044	656	656	399	3036	2109	4736
1970	1054	1244	656	656	390	3060	2100	4960
1971	1054	1444	656	1664	377	2956	2087	6064
1972	1054	1644	656	2384	457	3573	2167	7601
1973	1054	1844	656	3536	423	3505	2133	8885
1974	1054	1944	656	3824	396	3556	2106	9324
1975	1054	2144	656	3968	396	3716	2106	9828
1976	1054	2144	656	4688	382	3604	2092	10436
1977	1054	2144	656	4832	382	3604	2092	10580
1978	1054	2144	656	5120	376	3568	2086	10832
1979	1054	2144	656	5088	376	3568	2086	10800
1980	1054	2144	592	4896	376	3568	2022	10608
1981	1054	2144	536	4976	376	3568	1966	10688
1982	1049	2139	544	4992	328	3384	1921	10515
1983	1040	2130	568	5152	297	3520	1905	10802
1984	1030	2120	616	5536	297	3844	1943	11500
1985	1020	2110	648	5760	297	4104	1965	11974
1986	1005	2165	640	5632	312	4589	1957	12386
1987	1000	2300	640	5632	361	5070	2001	13002

Table 2  
USSR Strategic Offensive Force Loadings, 1956-1987

End Year	ICBMs		SLBMs		Bombers		Totals	
	<u>Lncher</u>	<u>Warhead</u>	<u>Lncher</u>	<u>Warhead</u>	<u>Lncher</u>	<u>Warhead</u>	<u>Lncher</u>	<u>Warhead</u>
1956					22	88	22	88
1957					28	112	28	112
1958			6	6	50	200	56	206
1959			33	33	75	300	108	333
1960	4	4	30	30	104	416	138	450
1961	10	10	57	57	120	480	187	547
1962	30	30	72	72	133	532	235	634
1963	80	80	72	72	150	612	302	764
1964	180	180	72	72	173	722	425	974
1965	225	225	75	75	163	697	463	997
1966	333	333	78	78	159	696	570	1107
1967	701	701	87	87	159	711	947	1499
1968	909	909	138	138	159	711	1206	1758
1969	1053	1053	221	215	157	703	1431	1971
1970	1361	1361	317	311	157	703	1835	2375
1971	1511	1511	407	401	157	703	2075	2615
1972	1547	1547	503	497	157	703	2207	2747
1973	1587	1587	595	595	157	703	2339	2885
1974	1587	1587	679	679	157	703	2423	2969
1975	1587	1917	771	771	157	703	2515	3391
1976	1539	2099	849	849	157	703	2545	3651
1977	1433	2363	972	1286	157	703	2562	4352
1978	1398	3218	1002	1641	157	703	2557	5562
1979	1398	4186	993	1712	157	703	2548	6601
1980	1398	5002	990	1789	157	703	2545	7494
1981	1398	5302	1038	2197	157	703	2593	8202
1982	1398	5862	990	2229	157	703	2545	8794
1983	1398	6270	978	2217	167	703	2543	9190
1984	1398	6420	982	2341	160	685	2540	9446
1985	1398	6420	980	2603	160	935	2538	9958
1986	1398	6420	948	2715	160	1065	2506	10200
1987	1392	6426	968	2999	155	1170	2515	10595



TABLE 3: US ICBM Launchers and Warheads/RVs, 1959-1986

1. The first Atlas D ICBM was placed on alert at Vandenberg Air Force Base (AFB), California on 31 October 1959. The first Atlas Ds were taken off alert at Vandenberg beginning on 1 May 1964. At full strength there were six ATLAS D ICBMs at Vandenberg, 15 at F.E. Warren AFB, Wyoming and nine at Offutt AFB, Nebraska.
2. Three nine missile squadrons of ATLAS E ICBMs were accepted by SAC in 1961 at Fairchild AFB, Washington (operational 3 October 1961); Forbes AFB, Kansas; and F.E. Warren AFB, Wyoming (operational 7 March 1961).
3. Six 12 missile ATLAS F ICBM squadrons became operational between 9 September and 20 December 1962 at Schilling AFB, Kansas; Lincoln AFB, Nebraska; Altus AFB, Oklahoma; Dyess AFB, Texas; Walker AFB, New Mexico; Plattsburgh AFB, New York.
4. On 20 April and 10 May 1962 the first two TITAN I ICBM squadrons (9 missiles each, both at Lowry AFB, Colorado) became operational. Four more nine missile squadrons became operational at Ellsworth AFB, South Dakota; Beale AFB, California; Mountain Home AFB, Idaho; and lastly on 28 September 1962 at Larson AFB, Washington.
5. Six nine missile squadrons of TITAN II ICBMs were deployed equally at Davis-Monthan AFB, Arizona; McConnell AFB, Kansas; and Little Rock AFB, Arkansas between 8 June and 31 December 1963.
6. The first MINUTEMAN missile went on alert on 27 October 1962 during the Cuban Missile crisis. A total of nine were on alert on 30 October and the first two flights of MINUTEMAN I ICBMs (20 missiles) were operational on 11 December 1962 at Malmstrom AFB, Montana. Eventually there were 150 MINUTEMAN IA ICBMs at Malmstrom and 650 MINUTEMAN IB ICBMs at Ellsworth AFB, South Dakota; Minot AFB, North Dakota; Whiteman AFB, Missouri; and F.E. Warren AFB, Wyoming.
7. The first three MINUTEMAN II ICBM squadrons became operational between 2 April and 22 November 1966. On 21 April 1967 SAC reached the level of 1000 operational MINUTEMAN I and II ICBMs.
8. On 29 December 1970 the first squadron of MINUTEMAN III ICBMs became operational at Minot AFB, North Dakota. By 12 July 1975 the MINUTEMAN ICBM force consisted of 450 MINUTEMAN IIs and 550 Minuteman IIIs.
9. On 22 December 1966 the first ten MX missiles became operational at F.E. Warren AFB, Wyoming, replacing MINUTEMAN III ICBMs.
10. Single Mk-1 reentry vehicle. The nuclear warhead entered Phase 5 (First Production Unit) in September 1958, the date the first warhead was produced by the Atomic Energy Commission.
11. Single Mk-2 reentry vehicle (also used on the ATLAS F and TITAN I ICBMs). The nuclear warhead entered Phase 5 (First Production Unit) in May 1961, the date the first warhead was produced by the Atomic Energy Commission.
12. Single Mk-6 reentry vehicle. The nuclear warhead entered Phase 5 (First Production Unit) in December 1962, the date the first warhead was produced by the Atomic Energy Commission.
13. Single Mk-5 reentry vehicle on the MINUTEMAN IA. The nuclear warhead entered Phase 5 (First Production Unit) in June 1962, the date the first warhead was produced by the Atomic Energy Commission.
14. The MINUTEMAN IB used a single warhead Mk-11 reentry vehicle. The nuclear warhead entered Phase 5 (First Production Unit) in March 1963, the date the first warhead was produced by the Atomic Energy Commission.
15. Single Mk-11C reentry vehicle. On 10 October 1967 the first Emergency Rocket Communications System (ERCS) was installed on ten Minuteman II ICBMs at Whiteman AFB, Missouri. ERCS, an emergency communications transmitter placed on the missile instead of a nuclear warhead, is still deployed on ten MINUTEMAN II ICBMs at Whiteman.
16. Up to three warheads on the Mk-12 MIRV. The nuclear warhead entered Phase 5 (First Production Unit) in March 1970, the date the first warhead was produced by the Atomic Energy Commission.

17. Up to three warheads on the MK-12A MIRV. The nuclear warhead entered Phase 5 (First Production Unit) in August 1979, the date the first warhead was produced by the Department of Energy. Between December 1979 and February 1983 300 MINUTEMAN III ICBMs were retrofitted with MK-12A reentry vehicles with the W78 warhead.

18. Up to ten warheads on the MK-21 MIRV. The nuclear warhead entered Phase 5 (First Production Unit) in April 1986, the date the first warhead was produced by the Department of Energy.

Sources for Table 3: Authors estimates based on J.C. Hopkins and Sheldon A. Goldberg, The Development of Strategic Air Command 1946-1986 (Offutt Air Force Base, Nebraska: Office of the Historian, Strategic Air Command, 1986); E. Michael Del Papa, "From Snark to SRAM: A Pictorial History of Strategic Air Command Missiles," Office of the Historian, Headquarters Strategic Air Command, Offutt AFB, Nebraska, 21 March 1976; Department of Defense, OSD, "Appendix I to the Memorandum for the President, Recommended Long Range Nuclear Delivery Forces 1963-1967," 23 September 1961 (partially declassified); Department of Defense, OSD, "Memorandum for the President, Recommended FY 1964-FY 1968 Strategic Retaliatory Forces," 21 November 1962 (partially declassified); Department of Defense, OSD, "Memorandum for the President, Recommended FY 1965-FY 1969 Strategic Retaliatory Forces," 6 December 1963 (partially declassified); Department of Defense, OSD, "Memorandum for the President, Recommended FY 1966-1970 Programs for Strategic Offensive Forces, Continental Air and Missile Defense Forces, Civil Defense," 3 December 1964 (partially declassified); Department of Defense "Memo [Deputy Secretary of Defense Cyrus R.] Vance to President, Military Strength Increases since FY 61, 3 October 1964, Annex G, S10P" (partially declassified) (located at Lyndon Baines Johnson Library); USAF Historical Division Liaison Office, The Air Force Response to the Cuban Crisis, mid-December 1962; Thomas B. Cochran, William M. Arkin, Robert S. Norris, Nuclear Weapons Databook: U.S. Nuclear Forces and Capabilities: Volume I, 2nd ed. (Cambridge, Mass: Ballinger Publishing Company, forthcoming); Warhead first production unit (FPU) dates from Thomas B. Cochran, William M. Arkin, Robert S. Norris, Milton M. Hoenig, Nuclear Weapons Databook: U.S. Nuclear Warhead Production: Volume II (Cambridge, Mass: Ballinger Publishing Company, 1987), pp. 10-11.

Table 4

USSR ICBM Launchers and Warheads/WVs, 1960-1987

	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987
<b>Soviet Union ICBM Launchers [1]</b>																												
SS-6 Sapswood	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
SS-7 Saddler	5	26	64	163	186	186	186	186	186	186	186	186	186	186	186	186	186	186	186	186	186	186	186	186	186	186	186	186
SS-8 Sasin	12	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23
SS-9 Scarp M1,M2,M3	12	30	106	166	204	262	287	238	188	188	178	162	90	82	43	0												
SS-9 M4																												
SS-11 Sego M1																												
SS-11 M2 & M3																												
SS-13 Savage																												
SS-17 Spenker M1																												
SS-17 M2																												
SS-17 M3																												
SS-18 Satan M1 & M3																												
SS-18 M2																												
SS-18 M4																												
SS-19 Stilette M1																												
SS-19 M2																												
SS-19 M3																												
SS-24 Scalpel																												
SS-25 Sickle																												
TOTAL	4	10	30	60	180	225	333	781	808	1063	1381	1511	1547	1587	1587	1533	1398	1398	1398	1398	1398	1398	1398	1398	1398	1398	1398	

	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987
<b>Soviet Union ICBM Warheads</b>																												
SS-6	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	
SS-7	6	26	64	163	186	186	186	186	186	186	186	186	186	186	186	186	186	186	186	186	186	186	186	186	186	186	186	
SS-8	12	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	
SS-9 M1,M2,M3 [2]	12	30	106	166	204	262	257	238	188	188	178	162	90	82	43	0												
SS-9 M4 [3]																												
SS-11 M1 [4]																												
SS-11 M2 & M3 [6]																												
SS-13																												
SS-17 M1 [8]																												
SS-17 M2 [7]																												
SS-17 M3 [8]																												
SS-18 M1 & M3 [9]																												
SS-18 M2 [10]																												
SS-18 M4 [11]																												
SS-19 M1 [12]																												
SS-19 M2 [13]																												
SS-19 M3 [14]																												
SS-24																												
SS-25 [15]																												
TOTAL (MRV=1)	4	10	30	60	180	225	333	781	808	1063	1381	1511	1547	1587	1587	1533	1398	1398	1398	1398	1398	1398	1398	1398	1398	1398	1398	
TOTAL (MRV=3)	4	10	30	60	180	225	333	781	808	1063	1381	1511	1547	1587	1587	1533	1398	1398	1398	1398	1398	1398	1398	1398	1398	1398	1398	

45 72 126  
45 72 126  
6420 6420 6420  
6690 6690 6690

TABLE 4: USSR ICBM Launchers and Warheads/RVs, 1960-1986

1. The initial operational capability (IOC) dates vary in different U.S. government sources. Initial deployment dates are from Soviet Military Power 1985, p. 41.
2. Single reentry vehicle. Mod 3 is the Fractional orbital bombardment system (FOBS).
3. Up to three warheads on multiple reentry vehicle (MRV). The MRV was a precursor to the MIRV, where the warheads could not be independently targetable. Because the area in which the warheads can be targeted is limited many tables count the multiple RVs as one warhead. For purposes of estimating warhead production they should be counted separately.
4. Single reentry vehicle. Mod 1 retired first to compensate for SS-25. All retired by end of 1987. Mod 2 uses penetration aids.
5. Up to three warheads on multiple reentry vehicle (MRV). Assumes 210 Mod 2 and 210 Mod 3 at peak deployment. Mod 2 is next to be after the Mod 1 to compensate for SS-25.
6. Up to four warheads on multiple independently targetable reentry vehicle (MIRV).
7. Single reentry vehicle.
8. Up to four warheads on multiple independently targetable reentry vehicle (MIRV).
9. Single reentry vehicle.
10. Up to eight warheads on multiple independently targetable reentry vehicle (MIRV).
11. Up to ten warheads on multiple independently targetable reentry vehicle (MIRV).
12. Up to six warheads on multiple independently targetable reentry vehicle (MIRV).
13. Single reentry vehicle.
14. Up to six warheads on multiple independently targetable reentry vehicle (MIRV).
15. Up to ten warheads on multiple independently targetable reentry vehicle (MIRV).

Sources for Table 4: Authors estimates based on Defense Intelligence Agency, "Intercontinental Strategic Forces Summary - USSR," DDB-2680-253-85, August 1985; Department of Defense, Soviet Military Power, editions 1981, 1983, 1984, 1985, 1986, 1987; Department of the Air Force, ACSI, "Trends in U.S. & Soviet Military Forces," June 1976 (declassified 17 October 1984); Department of the Air Force, ACSI, "Summary Review of Selected U.S. & Soviet Military Forces," 15 April 1975, (declassified 17 October 1984); Committee on Armed Services and Committee on Appropriations, United States Senate, Soviet Strategic Force Developments, Joint Hearing, S. Hrg. 99-335, 26 June 1985; Thomas B. Cochran, William M. Arkin, Jeffrey I. Sands, Nuclear Weapons Databook: Soviet Nuclear Weapons: Volume IV (Cambridge, Mass: Ballinger Publishing Company, forthcoming); Robert P. Berman and John C. Baker, Soviet Strategic Forces: Requirements and Responses (Washington, DC: The Brookings Institution, 1982); Michael McGwire, Military Objectives in Soviet Foreign Policy (Washington, DC: The Brookings Institution, 1987); Lawrence Freedman, U.S. Intelligence and the Soviet Strategic Threat, 2nd edition (Princeton, New Jersey: Princeton University Press, 1986); John Prados, The Soviet Estimate: U.S. Intelligence Analysis & Russian Military Strength (New York: The Dial Press, 1982); Raymond L. Garthoff, "The Meaning of the Missiles," Washington Quarterly (Autumn 1982), pp. 76-82; Desmond Ball, Politics and Force Levels: The Strategic Missile Program of the Kennedy Administration (Berkeley, California: University of California Press, 1980); Richard K. Betts, Nuclear Blackmail and Nuclear Balance (Washington, D.C.: The Brookings Institution, 1987), esp. pp. 144-172. pp. 3-32.



TABLE 5: US SLBM Launchers and Warheads/RVs, 1960-1986

1. USS George Washington (SSBN 598) first deployed with POLARIS A-1 SLBMs on 15 November 1960.
2. USS James Madison (SSBN 627) first deployed with POSEIDON C-3 SLBMs on 31 March 1971. On 10 June 1985, the White House announced that the U.S. would dismantle a ballistic missile submarine to remain within the SALT II ceiling on MIRVed missiles. The USS Sam Rayburn (SSBN 635) was subsequently deactivated. It is being converted into a training ship to train personnel in the Naval Nuclear Propulsion Program. The first training class is expected to begin in early 1989. On 27 May 1986, the White House announced that the U.S. would dismantle two more SSBNs. These were the USS Nathan Hale (SSBN 623) and the USS Nathaniel Greene (SSBN 636).
3. USS Ohio (SSBN 726) first deployed with TRIDENT I C-4 SLBMs on 1 October 1982.
4. The POLARIS A-1 was on active duty from 15 November 1960 to 14 October 1965.
5. The POLARIS A-2 was on active duty from 26 June 1962 to 9 June 1974.
6. The POLARIS A-3 was on active duty from 28 September 1964 to 25 February 1982.
7. On 20 October 1979, the USS Francis Scott Key (SSBN 657) deployed with TRIDENT I C-4 SLBMs. The twelfth and last Lafayette/Franklin class SSBN to be retrofitted with TRIDENT I C-4s, the USS Casimir Pulaski (SSBN 633) deployed on 3 June 1983.
8. Single Mk-1 (Navy) reentry vehicle. The nuclear warhead entered Phase 5 (First Production Unit) in June 1960, the date the first warhead was produced by the Atomic Energy Commission. The Mk-1 (Navy) was also on the POLARIS A-2.
9. Up to three warheads on the Mk-2 (Navy) multiple reentry vehicle (MRV). The MRV was a precursor to the MIRV, where the warheads could not be independently targetable. Because the area in which the warheads can be targeted is limited many tables count the multiple RVs as one warhead. For purposes of estimating warhead production they should be counted separately.
10. Up to ten warheads on the Mk-3 multiple independently targetable reentry vehicle (MIRV). The maximum number of reentry vehicles that have been flight-tested on the Poseidon C-3 SLBM is 14. Loadings per missile prior to withdrawal of ten POLARIS SSBNs probably averaged nine warheads; see testimony by Paul H. Nitze, Senate Armed Services Committee, SALT Hearings, Part 3, p. 897. After withdrawal POSEIDON SLBMs were selectively upgraded: see House Armed Service Committee (HASC), FY 1982 DOD, Part 3, p. 158; House Appropriations Committee, FY 1982 DOD, Part 7, p. 544; HASC, FY 1983 DOD, Part 4, p. 118. The nuclear warhead entered Phase 5 (First Production Unit) in May 1970, the date the first warhead was produced by the Atomic Energy Commission.
11. Up to eight warheads on the Mk-4 multiple independently targetable reentry vehicle (MIRV). The maximum number of reentry vehicles that have been flight tested for the TRIDENT I C-4 SLBM is seven. The figure of seven reentry vehicles for the TRIDENT I C-4 is based on the maximum number of reentry vehicles actually released during flight-tests of the missile as of 1 May 1979. If simulated releases of reentry vehicles had been counted as flight-tests of reentry vehicles, as is the case for simulations occurring after 1 May 1979, the figure for the TRIDENT I C-4 would have been eight, which is the largest number of reentry vehicles for which the missile is designed and with which it will be deployed; see Annex to Letter from Secretary of State Cyrus Vance to the President Transmitting the SALT Treaty, June 21, 1979 in ACDA, Documents on Disarmament 1979, p. 263. The nuclear warhead entered Phase 5 (First Production Unit) in June 1978, the date the first warhead was produced by the Department of Energy.

Sources for Table 5: Authors estimates based on Department of the Navy, Strategic Systems Program Office, "FBM Facts/Chronology: Polaris, Poseidon, Trident," 1986; Thomas B. Cochran, William M. Arkin, Robert S. Norris, Nuclear Weapons Databook: U.S. Nuclear Forces and Capabilities: Volume I, 2nd ed. (Cambridge, Mass: Ballinger Publishing Company, forthcoming); Warhead first production unit dates from Thomas B. Cochran, William M. Arkin, Robert S. Norris, Milton M. Hoenig, Nuclear Weapons Databook: U.S. Nuclear Warhead Production: Volume II, (Cambridge, Mass: Ballinger Publishing Company, 1987), pp. 10-11.

Table 6. USSR SLBM Launchers and Warheads/WVs, 1958-1967

	End-1958	1959	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988				
<b>Soviet Union Submarines</b>																																			
Golf I SSB	2	4	10	18	22	22	22	22	22	18	16	15	14	7	7	7	7	6	4	3	1	0													
Golf II					1	1	1	1	1	6	6	7	8	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13			
Golf III																					1	1	1	1	1	1	1	1	1	1	1	1			
Golf IV																					1	1	1	1	1	1	1	1	1	1	1	1			
Golf V																																			
Hotel I/II SSBM	7	0	0	1	1	1	1	2	3	6	6	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7			
Hotel III										1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1		
Yankee I SSBM					3	6	14	20	26	30	32	33	34	33	34	33	31	30	29	28	24	24	24	24	24	24	24	23	21	18	17				
Yankee II																					1	1	1	1	1	1	1	1	1	1	1	1	1		
Delta I SSBM										1	4	9	13	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18		
Delta II										1	2	3	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4		
Delta III																					4	6	9	10	13	14	14	14	14	14	14	14	14		
Delta IV																																			
Typhoon																																			
TOTAL	2	11	10	18	24	24	24	25	28	28	33	38	44	48	48	60	68	73	78	87	89	86	85	87	84	80	80	78	76	77					
<b>Soviet Union SLBM Launchers [1]</b>																																			
Golf I [2]	6	12	30	67	66	66	66	66	66	64	48	46	42	21	21	21	21	21	15	12	9	3	0												
Golf II [3]					3	3	3	3	3	16	18	21	24	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38		
Golf III [4]																					6	6	6	6	6	6	6	6	6	6	6	6	6		
Golf IV [5]																					4	4	4	4	4	4	4	4	4	4	4	4	4		
Golf V [6]																																			
Hotel I/II [7]	21	0	0	3	3	6	9	18	24	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21		
Hotel III [8]										6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6		
Yankee I [9]																					48	128	224	320	416	480	612	628	644	628	496	480	464	384	368
Yankee II [10]																					12	12	12	12	12	12	12	12	12	12	12	12	12	12	
Delta I [11]																					12	48	108	168	216	216	216	216	216	216	216	216	216	216	216
Delta II [12]																					16	32	48	64	64	64	64	64	64	64	64	64	64	64	64
Delta III [13]																					64	128	144	160	200	224	224	224	224	224	224	224	224	224	224
Delta IV [14]																																			
Typhoon [15]																																			
TOTAL	6	33	30	67	72	72	72	76	78	87	136	221	317	407	603	696	679	771	849	972	1002	993	990	1036	990	976	982	980	948	968					
<b>Soviet Union SLBM Warheads</b>																																			
SS-N-4	6	33	30	67	66	66	66	66	66	64	46	42	21	21	21	21	21	21	15	12	9	3	0												
SS-N-5 Sark					6	6	6	9	12	33	42	42	48	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	
SS-N-6 Serb [16]																					48	128	224	320	416	480	612	628	644	628	496	480	464	384	368
SS-N-6 Sawfly																					34	86	162	226	286	292	292	292	292	292	292	292	292	292	292
SS-N-17 Snipe																					12	12	12	12	12	12	12	12	12	12	12	12	12	12	
SS-N-18 stingray [17]																					384	768	864	864	864	864	864	864	864	864	864	864	864	864	864
SS-N-20 Sturgeon [18]																																			
SS-N-23 Skiff [19]																																			
TOTAL (MRV=1)	6	33	30	67	72	72	72	76	78	87	136	216	311	401	497	695	679	771	849	1266	1641	1712	1769	2187	2229	2217	2341	2603	2716	2989					
TOTAL (MRV=3) [20]																					727	867	993	1476	1881	2000	2077	2465	2617	2505	2628	2691	3003	3267	

TABLE 6: USSR SLBM Launchers and Warheads/RVs, 1958-1986

1. The initial operational capability (IOC) dates vary in different U.S. government documents. Initial deployment dates are from Department of Defense, Soviet Military Power, 1985, p. 40.
2. Carries 3 SS-N-4 SLBMs.
3. Carries 3 SS-N-5 SLBMs. These boats were originally GOLF Is with SS-N-4 SLBMs.
4. Carries 6 SS-N-8 SLBMs. This was a one-of-a-kind conversion from GOLF I with SS-N-4 SLBMs to carry the SS-N-8 SLBMs for test purposes.
5. Carries 4 SS-N-6 SLBMs. This is a test platform for the SS-N-6.
6. Carries 1 SS-N-20 SLBM. This is a test platform for the SS-N-20.
7. Carries 3 SS-N-5 SLBMs. It is unclear whether the seven HOTEL Is (each carrying three SS-N-4) were actually operational. They were removed from service in 1960-61 while being converted to HOTEL II so as to carry three SS-N-5. In addition one new HOTEL II was built as well.
8. Carries 6 SS-N-8 SLBMs. This boat was originally a HOTEL II, and was converted as a test platform for the SS-N-8 SLBM.
9. Carries 16 SS-N-6 SLBMs.
10. Carries 12 SS-N-17 SLBMs.
11. Carries 12 SS-N-8 SLBMs.
12. Carries 16 SS-N-8 SLBMs. The DELTA II is a lengthened version of the DELTA I submarine.
13. Carries 16 SS-N-18 SLBMs.
14. Carries 16 SS-N-23 SLBMs.
15. Carries 20 SS-N-20 SLBMs.
16. Some missiles have two warheads on multiple reentry vehicle (MRV). The MRV was a precursor to the MIRV, where the warheads could not be independently targetable. Because the area in which the warheads can be targeted is limited many tables count the multiple RVs as one warhead. For purposes of estimating warhead production they should be counted separately.
17. The SS-N-18 Mod 1 carries up to three warheads on multiple independently retargetable reentry vehicles (MIRV); the SS-N-18 Mod 2 carries a single reentry vehicle; the SS-N-18 Mod 3 carries up to seven warheads on MIRV. Average loading is six warheads.
18. Carries between six and nine warheads (average 7) on multiple independently targetable reentry vehicle (MIRV).
19. Up to ten warheads on multiple independently targetable reentry vehicles (MIRV).
20. Assumes the SS-N-6 Mod 3 with two warheads on multiple reentry vehicle (MRV) introduced in 1974 and gradually put on 18 Yankee I submarines.

Sources for Table 6: Authors estimates based on Defense Intelligence Agency, "Intercontinental Strategic Forces Summary - USSR," DDB-2680-253-85, August 1985; Department of Defense, Soviet Military Power, editions 1981, 1983, 1984, 1985, 1986, 1987; Department of the Air Force, ACSI, "Trends in U.S. & Soviet Military Forces," June 1976 (declassified 17 October 1984); Department of the Air Force, ACSI, "Summary Review of Selected U.S. & Soviet Military Forces," 15 April 1975, (declassified 17 October 1984); Committee on Armed Services and Committee on Appropriations, United States Senate, Soviet Strategic Force Developments, Joint Hearing, S. Hrg. 99-335, 26 June 1985; Department of the Navy, Understanding Soviet Naval Developments, NAVSO P-3560, fourth ed. (January 1981), fifth ed. (April 1985); Thomas B. Cochran, William M. Arkin, Jeffrey I. Sands, Nuclear Weapons Databook: Soviet Nuclear Weapons: Volume IV (Cambridge, Mass: Ballinger Publishing Company, forthcoming); Norman Polmar, Guide to the Soviet Navy, 4th edition (Annapolis, Maryland: Naval Institute Press, 1986); Norman Polmar, Guide to the Soviet Navy, third edition (Annapolis, Maryland: Naval Institute Press, 1983); Robert P. Berman and John C. Baker, Soviet Strategic Forces: Requirements and Responses (Washington, DC: The Brookings Institution, 1982); Michael McCgwire, Military Objectives in Soviet Foreign Policy (Washington, DC: The Brookings Institution, 1987); Lawrence Freedman, U.S. Intelligence and the Soviet

Strategic Threat, 2nd edition (Princeton, New Jersey: Princeton University Press, 1986); John Prados, The Soviet Estimate: U.S. Intelligence Analysis & Russian Military Strength (New York: The Dial Press, 1982).

Table 7  
U.S. Strategic Bombers and Bomber Weapons, 1946-1987

	End-1946	1947	1948	1949	1950	1951	1952	1953	1954	1955	1956	1957	1958	1959	1960	1961	1962	1963	1964	1965	1966
<u>United States Bombers (Total Inventory) [1]</u>																					
B-29 Superfortress	148	319	486	390	286	340	417	110	0												
B-36 Peacemaker			35	36	38	98	154	185	209	338	247	127	22	0							
B-50 Superfortress			35	99	196	219	224	138	90	0											
B-47 Stratojet						12	62	329	795	1086	1306	1285	1367	1366	1178	889	880	613	391	114	0
B-58 Hustler														19	66	76	86	94	93	83	
B-52 Stratofortress									18	97	243	380	488	538	571	639	636	626	600	591	
FB-111A																					
B-1B																					
TOTAL	148	319	556	525	520	669	857	762	1094	1442	1650	1655	1769	1854	1735	1528	1595	1335	1111	807	674

<u>United States Bombers (PAA) [2]</u>																					
B-29 [3]	125	270	420	330	230	290	360	90	0	[*]											
B-36 [4]			18	18	36	60	100	180	180	270	210	120	0								
B-50 [6]			35	99	196	219	200	135	90	0											
B-47						0	315	765	990	1215	1260	1260	1200	1065	855	675	450	180	45	0	
B-58														0	40	76	80	80	80	80	
B-52									0	45	225	360	345	450	500	555	525	525	525	495	
FB-111A																					
B-1B																					
TOTAL	125	270	473	447	462	569	660	720	1035	1260	1470	1605	1620	1545	1515	1395	1306	1055	785	650	575

<u>United States Bomber Weapons (Force Loadings)</u>																					
Bombs [8]	9	13	50	200	400	569	660	878	1418	1755	2123	2460	2610	2490	3083	2973	2920	2855	2953	3013	3043
Hounddog [9]															43	184	438	474	453	434	438
SRAM [10]																					
ALCM [11]																					
TOTAL	9	13	50	200	400	569	660	878	1418	1755	2123	2460	2610	2490	3126	3157	3358	3329	3405	3446	3481

	End-1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987
<u>United States Bombers (Total Inventory) [1]</u>																					
B-29 Superfortress																					
B-36 Peacemaker																					
B-50 Superfortress																					
B-47 Stratojet																					
B-58 Hustler	81	76	41	0																	
B-52 Stratofortress	588	579	505	459	412	402	422	422	420	419	417	344	343	343	344	300	263	263	263	263	263
FB-111A			3	42	30	60	71	72	69	68	66	66	65	63	62	62	61	60	60	60	60
B-1B																					
TOTAL	669	655	549	501	442	462	493	494	489	487	483	410	408	406	406	362	324	323	323	341	399

<u>United States Bombers (PAA) [2]</u>																					
B-29 [3]																					
B-36 [4]																					
B-50 [6]																					
B-47																					
B-58	78	76	39	0																	
B-52	480	405	360	360	347	397	357	330	330	316	316	316	316	316	316	272	241	241	241	241	241
FB-111A			0	30	30	60	66	66	66	66	66	60	60	60	60	56	56	56	56	56	56
B-1B																					
TOTAL	558	481	399	390	377	457	423	396	396	382	382	376	376	376	376	328	297	297	297	312	361

<u>United States Bomber Weapons (Force Loadings)</u>																					
Bombs [8]	3192	3139	3036	3060	2956	3398	3005	2656	2576	2464	2464	2428	2428	2428	2428	2052	1804	1804	1804	1924	2316
Hounddog [9]	N/A	382	250	279	276	272	270	263	262	246	230	199									
SRAM [10]						175	500	900	1140	1140	1140	1140	1140	1140	1140	1140	1140	1140	1140	1140	1140
ALCM [11]															0	192	576	900	1160	1525	1614
TOTAL	3192	3521	3286	3339	3232	3845	3776	3819	3978	3850	3834	3767	3568	3568	3384	3520	3844	4104	4589	5070	

TABLE 7: US Strategic Bombers and Bomber Weapons, 1946-1986

1. Includes the total number of bombers in the Strategic Air Command active inventory ("assigned resources," not bombers in inactive storage) as of the end of the year (December).
2. Primary Authorized Aircraft (PAA). Previously, the term Unit Equipment (UE) was used. Both terms specify the number of aircraft assigned to operational units in combat ready condition.
3. Not all B-29 bombers were modified to carry nuclear weapons. On 31 December 1946 there were 23 nuclear modified B-29 bombers; on 1 March 1947 there were 35; on 1 December 1948 there were 38; in mid-January 1949 there were 66; and on 1 January 1950 there were 95. See David Alan Rosenberg, "U.S. Nuclear Stockpile, 1945 to 1950," Bulletin of the Atomic Scientists, May 1982, p. 30.
4. Not all B-36 bombers were modified to carry nuclear weapons. On 1 December 1948 there were four nuclear modified B-36 bombers; by mid-January 1949 there were 17; and by 1 January 1950 there were 34. Ibid.
5. Effective 1 October 1955, SAC's four heavy Strategic Reconnaissance Wings were redesignated heavy Bombardment Wings in recognition of the conversion of the RB-36 from a reconnaissance airplane to a bomber.
6. Not all B-50 bombers were modified to carry nuclear weapons. On 1 December 1948 there were 18 nuclear modified B-50 bombers; by mid-January 1949 there were 38; and by 1 January 1950 there were 96. Ibid.
7. On 1 July 1950 there were a total of 264 nuclear modified B-29, B-36 and B-50 bombers.
8. There is no easy or accurate method for estimating the actual number of weapons the bomber forces carry. How each bomber is loaded is determined by its Single Integrated Operational Plan (SIOP) mission. The SIOP is the central nuclear war plan of the U.S. It is developed by the Joint Strategic Target Planning Staff at the Strategic Air Command in Omaha, Nebraska. It is incredibly complex matching over 10,000 nuclear warheads with their targets taking into account factors of reliability, timing, target hardness, collateral damage, etc. The U.S. bomber's role in the overall plan must be integrated with ballistic missile salvos from SSBNs and land based forces in the U.S. and Europe. Bombers are on alert at each SAC base but those in the northern parts of the U.S. have the least distance to fly over the north pole and would be the first to reach the Soviet Union. Therefore it is likely that those bombers have a full complement of SRAMs intended for defense suppression and making corridors through which following bombers would fly. The counting assumptions for bomber loadings of nuclear weapons are as follows:

- \* 1) 1946-48: Actual number of bombs in the stockpile as of June 30; Rosenberg, op. cit.
- \* 2) 1949-50: Rosenberg, op. cit. reports 240 mechanical assemblies as of June 30, 1949 and "at least 292" nuclear components and 688 mechanical assemblies as of 30 June 1950. We assume that there were 200 bombs by the end of 1949 and 400 by the end of 1950.
- \* 3) 1951-52: Prior to the deployment of the B-47 bomber, the assumption is that there is a sufficient number of bombs for each PAA aircraft.
- \* 4) 1953-55: B-29, B-36 and B-50 bombers continue to carry one bomb per aircraft. The assumption for the B-47 bomber from 1953 to 1965 is that there were an average of 1.5 bombs per aircraft; based on Department of Defense, OSD, "Memorandum for the President, Recommended FY 1965-FY 1969 Strategic Retaliatory Forces," 6 December 1963, p. 1-2 (partially declassified).
- \* 5) 1956-59: B-36 and B-47 bombers carry one and 1.5 bombs, respectively (see above). B-52 average loading is two bombs per bomber.
- \* 6) 1960: With the introduction of the versatile B28 bomb in quantity the B-52 bomber force loading goes up to 3.3 bombs per plane; see Department of Defense, OSD, "Memorandum for the President, Recommended FY 1965-FY 1969 Strategic Retaliatory Forces," 6 December 1963, p.1-2 (partially declassified).
- \* 7) 1961-62: The B-58 bomber carries one bomb until 1964. B-47 and B-52 bomber force loadings continue as above.

- \* 8) 1963: The average bomb force loading per B-52 bomber increases to four.
- \* 9) 1964-69: The B-58 is modified to carry four bombs. B-52 bomber force loadings gradually increase from 4.5 to 8 bombs per plane. The average bomb loadings are assumed to be: 4.5 in 1964, 5 in 1965, 5.5 in 1966, 6 in 1967, 7 in 1968, and 8 in 1969.
- \* 10) 1970-71: The average bomb loadings for the B-52 and FB-111A bombers are eight and six respectively.
- \* 11) 1972-86: Twenty FB-111A bombers carry six SRAMs each and no bombs. The remaining FB-111A bombers carry six bombs each. The remaining SRAMs are carried on B-52 bombers. B-52 bombers loaded with SRAMs carry 12 SRAMs and four bombs. The remaining B-52 bombers carry an average of eight bombs. B-1B bombers beginning in 1986 carry eight bombs.

9. Eighty percent of the total inventory of nuclear armed Hound Dog (AGM-288) air-to-surface missiles are force loadings.

10. Counting assumptions for nuclear-armed Short Range Attack Missiles (SRAM) (AGM-69A). The total number of operational SRAMs is 1140 from 1975-1986; HAC, FY 1982 DOD, Part 2, p. 101. The SRAM inventory peaked in 1975 at 1471. During the 1972-74 period, SRAM operational missiles were assumed to be the same ratio of operational/total inventory as in 1975.

11. Counting assumptions for nuclear armed Air-Launched Cruise Missiles (ALCM) (AGM-86B). The number of ALCMs is assumed to be 12 per modified and deployed B-52G/H bomber.

Sources for Table 7: Authors estimates based on J.C. Hopkins and Sheldon A. Goldberg, The Development of Strategic Air Command 1946-1986 (Offutt AFB, Nebraska: Office of the Historian, Strategic Air Command, 1986); Department of Defense, OSD, "Appendix I to the Memorandum for the President, Recommended Long Range Nuclear Delivery Forces 1963-1967," 23 September 1961 (partially declassified); Department of Defense, OSD, "Memorandum for the President, Recommended FY 1964-FY 1968 Strategic Retaliatory Forces," 21 November 1962 (partially declassified); Department of Defense, OSD, "Memorandum for the President, Recommended FY 1965-FY 1969 Strategic Retaliatory Forces," 6 December 1963 (partially declassified); Department of Defense, OSD, "Memorandum for the President, Recommended FY 1966-1970 Programs for Strategic Offensive Forces, Continental Air and Missile Defense Forces, Civil Defense," 3 December 1964 (partially declassified); Department of Defense, "Memo [Deputy Secretary of Defense Cyrus R.] Vance to President, Military Strength Increases since FY 81, 3 October 1964, Annex G, SIOP" (located in Lyndon Baines Johnson Library)(partially declassified); Thomas B. Cochran, William M. Arkin, Robert S. Norris, Nuclear Weapons Databook: U.S. Nuclear Forces and Capabilities: Volume I, 2nd ed. (Cambridge, Mass: Ballinger Publishing Company, forthcoming).



TABLE 8: USSR Strategic Bombers and Bomber Weapons, 1956-1986

1. The number of bombers is assumed to be the equivalent of U.S. Primary Authorized Aircraft (PAA). This does not include aircraft in storage or inactive aircraft.
2. Force loadings from 1956-1959 are authors estimates of bombs available for combat; from 1960-1987, the force loadings are authors estimates based on the counting rules below.
3. Bear A bombers carry four bombs each, and no air-to-surface missiles.
4. Bear B/C bombers carry five bombs or a single AS-3 air-to-surface missile.
5. Bear G bombers carry four bombs and two AS-4 air-to-surface missiles per plane. Bear B/C bombers are currently being converted to Bear G models.
6. In 1984, newly produced Bear H bombers began to be deployed. These bombers are counted as carrying eight AS-15 air-launched cruise missile and and four bombs.
7. Bison bombers carried four bomber weapons each.

Sources for Table 8: Authors estimates based on Defense Intelligence Agency, "Intercontinental Strategic Forces Summary - USSR," DDB-2680-253-85, August 1985; Department of Defense, Soviet Military Power, editions 1981, 1983, 1984, 1985, 1986, 1987; Department of the Air Force, ACSI, "Trends In U.S. & Soviet Military Forces, June 1976 (declassified 17 October 1984); Department of the Air Force, ACSI, "Summary Review of Selected U.S. & Soviet Military Forces," 15 April 1975, (declassified 17 October 1984); Committee on Armed Services and Committee on Appropriations, United States Senate, Soviet Strategic Force Developments, Joint Hearing, S. Hrg. 99-335, 26 June 1985; Thomas B. Cochran, William M. Arkin, Jeffrey I. Sands, Nuclear Weapons Databook: Soviet Nuclear Weapons: Volume IV (Cambridge, Mass: Ballinger Publishing Company, forthcoming); Robert P. Berman and John C. Baker, Soviet Strategic Forces: Requirements and Responses (Washington, DC: The Brookings Institution, 1982); Michael McGwire, Military Objectives in Soviet Foreign Policy (Washington, DC: The Brookings Institution, 1987); Lawrence Freedman, U.S. Intelligence and the Soviet Strategic Threat, 2nd edition (Princeton, New Jersey: Princeton University Press, 1986); John Prados, The Soviet Estimate: U.S. Intelligence Analysis & Russian Military Strength (New York: The Dial Press, 1982); SASC, FY 1987 DOD, Part 1, p. 125.

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