THE BOMB BOOK

The Nuclear Arms Race In Facts And Figures

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Natural Resources Defense Council
1350 New York Avenue, NW
Washington, DC 20005
202 783 7800

A PROJECT OF THE NRDC NUCLEAR WEAPONS DATABOOK

INTRODUCTION

This book is a set of tables summarizing the nuclear weapons arsenals of the world. It has been prepared by the authors of the Nuclear Weapons Databook series.

In preparing the Databook series we have continually updated and revised our statistical data. The following tables are the product of this effort specially produced for the December Summit between President Reagan and General Secretary Gorbachev. We have decided to make these data more widely available because of the many requests, their value to other researchers, and because we are constantly seeking revisions from our readers. We have chosen a loose-leaf format to facilitate periodic revisions and to permit the user to add additional tables and figures.

Detailed information about nuclear weapons is controlled by the respective governments on the basis of "national security." The following tables represent our best estimates based on a comprehensive analysis of the open literature. We believe they are the most accurate data of their kind in the open literature.

We recognize, nonetheless, that these estimates can be improved, particularly regarding the nuclear arsenals of the Soviet Union and other non-U.S countries. We urge the user to alert us to any errors and to new sources of data. We would also appreciate hearing from you regarding what other tables and alternative formats would be most useful.

Thomas B. Cochran
William M. Arkin
Robert S. Norris

Nuclear Weapons Databook
Natural Resources Defense Council
1350 New York Avenue, N.W.; Suite 300
Washington, D.C. 20005
Tel: (202) 783-7800
Telex: 2614423 MCIUW

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1. U.S. Nuclear Stockpile (December 1987)

Warhead/Weapon	First Produced	Yield (kt)	User	Number	Status
Intercontinental ballistic missiles					
W56/Minuteman II	3/63	1200	AF	475	450 ICBMs, no planned silo replacement
W62/Minuteman III* (Mk-12)	3/70	170	AF	700	220 ICBMs, being partially replaced by MX/W87
W78/Minuteman III (Mk-12A)	8/79	335	AF	950	300 ICBMs retrofitted between 12/79 and 2/83
W87/MX/Peacekeeper*	4/86	300	AF	360	30 ICBMs, 500 planned by December 1988
subtotal				2485	
Submarine-launched ballistic missiles					
W68/Poseidon*	5/70	40	N	2700	Being replaced by TRIDENT I/W76
W76/Trident I	6/78	100	N	3200	To be replaced by TRIDENT II
subtotal				5900	
Bombs and bomber weapons					
B28/bomb*	8/58	70-1450	AF,MC,N,NATO	530	Being replaced by B61 and B83 bombs
B43/bomb*	4/61	1000	AF,MC,N,NATO	775	Being replaced by B61-3,-4 and B83 bombs
B53/strategic bomb*	8/62	9000	AF	50	Being replaced by B83 strategic bomb
B57 bomb*	1/63	<1-20	AF,MC,N,NATO	1195	To be replaced by ND/SB
B61-0,1,7/bomb	10/66	<1-500	AF	1100	Allocated to SAC
B61-3*,4*/bomb	5/79	<1-345	AF,NATO	1300	Mods 3/4 replacing old AF/Navy bombs
B61-2,5/bomb	3/75	<1-500	MC,N	625	Being replaced by Mods 3D/4D
W69/SRAM	10/71	170	AF	1175	To be replaced by SRAM II
W80-1/ALCM*	12/81	5-150	AF	1700	1500 Advanced Cruise Missiles planned
B83/strategic bomb*	6/83	low-1200	AF	1000	To replace SAC B28, B43 and B53 bombs
subtotal				9450	
Intermediate- and Short-range missiles					
W50/Pershing Ia*	3/63	60,200,400	NATO	100	In West German service
W70-0,-1,-2/Lance	6/73	1-100	A,NATO	905	To be replaced by Follow-on to Lance
W70-3/Lance ER	5/81	<1	A	380	In storage at Army depots in U.S.
W84/GLCM*	6/83	.2-150	AF	300	An additional 200 by end of 1988
W85/Pershing II	2/83	.3-80	A	120	Replaced U.S. Pershing Ia
subtotal				1805	
Artillery and Demolitions					
W33/8-inch arty*	1/57	<1-12	A,MC,NATO	750	To be replaced by W79
W48/155mm arty*	10/63	0.1	A,MC,NATO	925	To be replaced by W82
W54/Special ADM	4/61	.01-1	A,N,MC	300	No planned replacement
W79/8-inch ER arty	9/81	.8	A,MC	40	May be converted to non ER versions
W79/8-inch arty	10/84	1.1	A,MC,NATO	300	Production completed August 1986
subtotal				2315	

Air defense missile

W31/Nike Hercules*	10/58	<1-20	NATO	100	In West German and Italian service
W45/Terrier*	1/62	1	N	285	May be replaced by Standard-2(N)/W81
subtotal				385	

Anti-submarine weapons

W44/ASROC*	5/61	1	N	575	May be replaced by Sea Lance (N)
W55/SUBROC*	6/64	1-5	N	285	May be replaced by Sea Lance (N)
B57 depth bomb	1/63	<1-20	N	900	To be replaced by NS/DB
subtotal				1760	

Sea-launched cruise missiles

W80-0/Tomahawk#	12/83	5-150	N	150	758 planned for 200 ships/submarines

*Weapons scheduled in present plans for complete or partial retirement in 1987-1990s.
#In production

ICBMs, SLBMs, ALCMs and SRAMs are counted as on-line missiles plus about 5 percent additional warheads for maintenance spares, except for the MX, which is counted as 20 percent during production.

The U.S. nuclear stockpile contains approximately 24,250 warheads and bombs. There are currently 26 types in the stockpile, six of which are in production. The most number of types in the stockpile was 33 from mid-1964 to early 1965. During the same period 17 types were simultaneously in production. Approximately 9,500 new warheads and bombs have been produced from 1981-1987. During this period, new weapons were added to the stockpile at a rate slightly less than that at which older weapons were being retired.

2. Soviet Nuclear Stockpile (December 1987)

Warhead/Weapon	Number Launchers	Total Warheads[1]
Strategic Offensive Forces		
ICBMs	1392	6846
SLBMs	968	3287
Bomber weapons	155	1170
subtotal	2515	11,303
Strategic Defensive Forces		
ABMs	96	100
Surface-to-air missiles	7885	5000
subtotal	7881	5100
Total Strategic	10,396	16,403
Non-strategic Forces		
Intermediate- and Short-range missiles		
Non-strategic SLBMs	39	39
LRINF (SS-20, SS-4)	553	1435
SRINF (SS-12M, SS-23)	160	160
SNF (SCUD, FROG 7, SS-21)	1384	1384
subtotal	2136	3018
Non-strategic Land-based Aircraft		
ASMs and bombs	4075	4800[2]
subtotal	4075	4800
Artillery and Demolitions		
Artillery	7040	2820[3]
ADMs	unk	unk
subtotal	7040+	2820+

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[1] This column gives the number of deliverable nuclear warheads on operational systems. It does not include warheads that may be available for reloads or spares. The total number of U.S. nuclear warheads is approximately 5-10 percent over the operational figure.

[2] Assumes the same ratio of bomber weapons on tactical aircraft in the Soviet Union and the U.S. The actual number of nuclear bombs and warheads on aircraft-delivered weapons is unknown.

[3] Assumes the ratio of warheads to guns in the same for the Soviet Union and the U.S. The actual number of nuclear artillery projectiles is unknown.

Naval

ASMs and bombs	450	450
SLCMs	942	398
SAMs	n.a.	256
ASW weapons	n.a.	1401
Coastal missile	100	100
Artillery	n.a.	100
Mines	unk	unk
subtotal	---	2705+
Total Non-strategic	---	13,343+
Total	---	~30,000

Represents author's estimates of total Soviet nuclear stockpile based upon numbers of nuclear capable launchers.

3. U.S. and Soviet Cumulative Nuclear Weapons Yield (1965-1983)

Year	Megatons	
	United States	Soviet Union
1965	14,134	11,181
1966	13,053	12,645
1967	11,856	13,884
1968	11,045	15,225
1969	10,929	16,568
1970	9114	17,630
1971	7994	18,459
1972	7955	19,195
1973	7917	19,849
1974	7801	20,249
1975	6797	20,307
1976	5561	19,793
1977	5484	18,806
1978	5368	17,860
1979	5329	16,762
1980	5291	15,556
1981	5059	14,700
1982	5020	14,025
1983	4904	13,468

* Relative scales based upon information released by the Department of Defense.

The explosive energy released in a nuclear explosion is called its yield. Yield is measured in terms of an equivalent amount of TNT (trinitrotoluene). The yield of a nuclear weapon is usually expressed in kilotons (1 Kt = 1000 tons of TNT) or megatons (1 Mt = 1,000,000 tons of TNT). Translating this into pounds gives 1 Kt = 2,000,000 pounds and 1 Mt = 2,000,000,000 pounds of TNT equivalent respectively. Common high-explosive aerial bombs used during World War II and the Vietnam War weighed 500-1000 pounds of which about 50 percent is explosive. Expressed in kilotons these munitions have the power of .000125-.00025 Kt. There has been great variety in the yields of bombs and warheads in the U.S. stockpile. The smallest have been on the order of .01 Kt or 10 tons of TNT. This "tiny" nuclear weapon is 40 times as large as a 1000 pound high expolosive bomb. The largest U.S. weapons have been several types of bombs produced in the 1950s and 1960s with an explosive power up to 20 MT.

The sum of the yields of all the warheads in the stockpile is called the cumulative yield, or simply the megatonnage. With the introduction of large numbers of thermonuclear weapons into the stockpile beginning in 1955 the megatonnage rose dramatically peaking in 1960 at about 19,000 Mt. At this time the Strategic Air Command, which dominated U.S. war plans and operations, had approximately 1600 bombers which carried thousands of bombs many of which had high yields. This soon changed when land based and submarine launched ballistic missiles entered the arsenal and bombers were retired. Megatonnage came down as lighter weight more accurate missile warheads replaced heavier less accurate ones and the strategic bomber force used lighter weight, lower yield (but more versatile) bombs. This trend is now reversing itself. Several new warheads for ballistic missiles are both more accurate and have higher yields.

4. U.S. Strategic Offensive Forces (1946-1987)

End Year	ICBMs		SLBMs		Bombers		Total	
	Launchers	Warheads	Launchers	Warheads	Launchers	Warheads	Launchers	Warheads
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	10,436
1977	1054	2144	656	4832	382	3604	2092	10,580
1978	1054	2144	656	5120	376	3568	2086	10,832
1979	1054	2144	656	5088	376	3568	2086	10,800
1980	1054	2144	592	4896	376	3568	2022	10,608
1981	1054	2144	536	4976	376	3568	1966	10,688
1982	1049	2139	544	4992	328	3384	1921	10,515
1983	1040	2130	568	5152	297	3520	1905	10,802
1984	1030	2120	616	5536	297	3844	1943	11,500
1985	1020	2110	648	5760	297	4104	1965	11,974
1986	1005	2165	640	5632	312	4589	1957	12,386
1987	1000	2300	640	5632	361	5070	2001	13,002

5. Soviet Strategic Offensive Forces (1958-1987)

End Year	ICBMs		SLBMs[1]		Bombers		Total	
	Launchers	Warheads	Launchers	Warheads	Launchers	Warheads	Launchers	Warheads[2]
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	10,200
1987	1392	6426	968	2999	155	1170	2515	10,595

1 Includes the SS-N-5 missile on Golf II class submarines.
2 Multiple reentry vehicles are counted individually.

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U.S. and Soviet Strategic Nuclear Forces

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15. Soviet Strategic Bombers

During 1987 the U.S. and the Soviet Union deployed approximately 1250 new strategic weapons: almost 700 for the U.S. and over 550 for the Soviet Union. These include: the last 90 Air Launched Cruise Missiles (ALCMs) which are now operational on B-52G/Hs at six Strategic Air Command (SAC) bases; 20 more MX missiles carrying 200 warheads at F.E. Warren AFB, Wyoming; and approximately 400 new B83 gravity bombs for 50 B-1B bombers delivered during the year. The ballistic missile submarine force remained the same size. The next Trident submarine is scheduled for introduction into service in 1989. The U.S. removed approximately twenty Minuteman III missiles from silos to be able to deploy the MX. The most dramatic recent trend for the U.S. has been an increase in bomber weapons with the introduction of ALCMs for a portion of the B-52 force and new gravity bombs for the B-1B bomber.

During 1987, the Soviet Union deployed approximately 50 new SS-25 ICBMs and the first few rail mobile SS-24s. The fourth Typhoon and third Delta IV strategic submarines became operational while the next units of each model were launched. Bear bombers continued to be converted to the G model and new H models were produced. Approximately 20 Bear Hs with 160 new AS-15 long-range ALCMs were deployed. The Soviet Union continued to retire SS-11s under SALT and began drawing down SS-17s as the SS-24 was fielded. The last 15 Bison bombers were removed from service during 1987.

6. U.S. and Soviet Strategic Nuclear Forces Summary (December 1987)

	U.S.	Soviet
Launchers/Delivery Vehicles		
Intercontinental Ballistic Missiles (ICBMs)	1000	1392
Submarine-launched Ballistic Missiles (SLBMs)	640	928
Bombers	361	155
Total	**2001**	**2475**
Warheads		
On Intercontinental Ballistic Missiles	2310	6846[1]
On Submarine-launched Ballistic Missiles	5632	3232[2]
On Bombers	5070	1170
Total	**13,012**	**11,248**
Total Explosive Power (megatons)	3050	6500
Ballistic Missile Throwweight (million lbs)	~4.2	~12.3

U.S. strategic forces have grown by over 5400 warheads since the signing of the SALT I Treaty (1972) and by almost 2400 warheads during the Reagan Administration (1981-1987). Soviet strategic forces have grown by 7850 warheads since the signing of the SALT I Treaty and by 3100 warheads during the Reagan Administration.

Since the Reagan Administration took office, the combined strategic arsenals of the United States and the Soviet Union have increased by 5,500 nuclear warheads. U.S. strategic forces have increased by some 2,400 warheads and Soviet forces by 3,100. Growth in U.S. strategic nuclear forces is predominantly due to the addition of 1,600 Air-launched Cruise Missiles to the B-52 bomber force, and a greater number of submarine-launched ballistic misiles with multiple independently targetable (MIRVed) warheads. Growth in Soviet strategic nuclear forces has been the result of MIRVing of the land-based missile force (the addition of 1400 warheads) and the submarine missile force (the addition of 1200 warheads).

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[1] ICBM warheads are counted individually. Some count multiple reentry vehicles (MRVs) which are not independently targetable as one. The number of Soviet warheads on ICBMs would be 6426 if counted this way.
[2] SLBM warheads are counted individually. Some count multiple reentry vehicles (MRVs) which are not independently targetable as one. The number of Soviet warheads on SLBMs would be 2960 if counted this way.

7. U.S. Strategic Nuclear Forces (December 1987)

Type/Name	Launchers	Year Deployed	Warhead x Yield (Mt)	Warhead Force Levels
ICBMs				
LGM-30F Minuteman II	450	1966	1 x 1.2	450
LGM-30G Minuteman III	520			1560
Mk-12	(220)	1970	3 x .170 (MIRV)	(660)
Mk-12A	(300)	1979	3 x .335 (MIRV)	(900)
LGM-118A MX/Peacekeeper	30	1986	10 x .300 (MIRV)	300
subtotal	1000 (50%)			2310 (18%)
SLBMs				
UGM-73A Poseidon C-3	256	1971	10 x .40 (MIRV)[1]	2560
UGM-96A Trident I C-4	384	1979	8 x .100 (MIRV)	3072
subtotal	640 (32%)			5632 (43%)
Bombers				
B-1B	64	1986	} ALCM .05 -.150	1614
B-52G/H Stratofortress	241	1958/61	} SRAM .170	1140
FB-111A	56	1969	} Bombs .500	2316
subtotal	361 (18%)			5070 (39%)
Total	2001			13,012

The current composition of U.S. strategic nuclear forces is: 43 percent on the submarine force, 39 percent on the bomber force, and 18 on the land-based missile force. This is in marked contrast to Soviet strategic nuclear forces (see Table 8) which favors the land-based missile force (61 percent of total Soviet strategic nuclear warheads). The composition of U.S. strategic nuclear forces in launchers is: 50 percent land-based missiles, 32 percent submarine-launched missiles, and 18 percent bombers. Submarines and bombers, which constitute 50 percent of the force carry 82 percent of the warheads. The trend in U.S. strategic nuclear forces, with deployment of Air-launched cruise missiles, has been to arm the bomber force with a larger percentage of the total.

[1] The Poseidon C3 missile reportedly carries 6, 10, or 14 warheads. The average is 10 warheads.

8. Soviet Strategic Nuclear Forces (December 1987)

Type/ NATO Codename		Launchers	Year Deployed	Warhead x Yield (Mt)	Warhead Force Levels[1]
ICBMs[2]					
SS-11	Sego	394			814
M2		(184)	1973	1 x .950 - 1.1	(184)
M3		(210)	1973	3 x .100 -.350 (MRV)	(630)
SS-13 M2	Savage	60	1973	1 x .600 -.750	60
SS-17 M3	Spanker	139	1979	4 x .750 (MIRV)	556
SS-18 M4	Satan	308	1979	10 x .500 - .550 (MIRV)	3080
SS-19 M3	Stiletto	360	1979	6 x .550 (MIRV)	2160
SS-24	Scalpel	5	1987	10 x .100 (MIRV)	50
SS-25	Sickle	126	1985	1 x .550	126
subtotal		1392 (56%)			6846 (61%)
SLBMs					
SS-N-6 M3	Serb	272	1973	2 x .375 - 1 (MRV)	544
SS-N-8 M1/M2	Sawfly	292	1973	1 x 1 - 1.5	292
SS-N-17	Snipe	12	1980	1 x .500 - 1	12
SS-N-18 M1-3	Stingray	224	1978	6 x .200 -.500 (MIRV)	1344
SS-N-20	Sturgeon	80	1983	7 x .100 (MIRV)	560
SS-N-23	Skiff	48	1986	10 x .100 (MIRV)	480
subtotal		928 (37%)			3232 (29%)
Bombers					
Tu-95	Bear A	30	1956	4 bombs (1)	120
Tu-95	Bear B/C	30	1962	5 bombs or 1 AS-3 (3)	150
Tu-95	Bear G	40	1984	4 bombs and 2 AS-4 (.600)	240
Tu-95	Bear H	55	1984	8 AS-15 (.250) and 4 bombs (1)	660
subtotal		155 (6%)			1170 (10%)
Total		2475			11,028

The current composition of Soviet strategic nuclear forces is: 61 percent on the land-based missile force, 29 percent on the submarine force, and 10 on the bomber force. The distribution of warheads for the most part follows the same percentages. A continuing trend will be the MIRVing of the submarine force and, like the U.S., a larger number of bombers and bomber weapons with newly produced Bear H bombers and the soon to be deployed Blackjack.

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1 Multiple reentry vehicles (MRVs) on SS-11 M3 and SS-N-6 M3 are counted individually.

2 Some 60 SS-16 mobile test ICBMs were produced, although whether any were ever operational is in dispute. All SS-16s were reportedly dismantled in 1985.

9. U.S. and Soviet Strategic Defensive Nuclear Forces (December 1987)

Missile Type	Launchers	Warheads
United States		
Anti-ballistic Missiles		
Sprint[1]	0	72
Total U.S.	0	72
Soviet		
Anti-ballistic Missiles[2]		
Improved Galosh	16	16
Gazelle	80	80
subtotal	96	96
Surface-to-air Missiles		
SA-1 Guild	2220	2200
SA-2 Guideline	2675	900
SA-5 Gammon	2030	1300
SA-10 Grumble	960[3]	600
subtotal	7885	5000
Total Soviet	7981	5096

The number of nuclear warheads on long-range surface-to-air missiles is uncertain. The estimates assume that all SA-1 launchers defending Moscow have missiles with nuclear warheads, some SA-2 (one third), most SA-5s (two-thirds) and most SA-10s (two-thirds). All warhead estimates have been rounded to two significant figures. The SA-12A Giant surface-to-air missile is being deployed for the first time in late 1987.

The U.S. does not have any operational strategic defense nuclear systems. The last of several thousand Genie air-to-air nuclear missiles arming the U.S. and Canadian fighter interceptor force was retired in December 1984. The last of several thousand Nike Hercules surface-to-air missiles deployed in the U.S. with nuclear warheads was deactivated in 1978. Sprint anti-ballistic missiles and nuclear warheads are in storage in the U.S.

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1 The Sprint anti-ballistic missile, a part of the Safeguard system near Grand Forks, North Dakota was operational for one month in 1975. The system was then deactivated and put in storage. The missiles and W-66 nuclear warheads are still in storage.

2 The ABM system around Moscow is being upgraded from the ABM-1/ABM-1B configuration with Galosh and Improved Galosh missiles to the ABM-3 configuration with Gazelle missiles. Designations of the Soviet missiles are unclear but are thought to be SH-8 for the Improved Galosh and SH-11 for the Gazelle.

3 Each SA-10 launcher has four rails. This is the number of launchers.

10. U.S. ICBMs (December 1987)

Missile Type	Launchers	Throwweight Per Missile (1000 lbs)	Total Mt	Warhead Force Levels	Total Stockpile
Minuteman II (LGM-30F)	450	1.6	540.0	450	475
Minuteman III (LGM-30G)	520	2.4	413.7	1560	1650
Mk-12	(220)		(112.2)	(660)	(700)
Mk-12A	(300)		(301.5)	(900)	(950)
MX/Peacekeeper (LGM-118A)	30	7.9	90.0	300	360
Total	1000	2200	1043.7	2310	2485

Warhead force levels represent those warheads on "on-line" missile launchers as well as those being kept for missiles in temporary overhaul, repair, conversion, and modernization. They do not include those warheads in storage which could be fitted to test missiles in storage or spare maintenance missiles, or potential reload missiles. Total stockpile is author's estimates of warhead force levels plus warheads which are maintenance spares and floats, or could be used for reloads.

Ten Minuteman II missiles at Whiteman AFB, Missouri are part of the Emergency Rocket Communications System (ERCS) and are equipped with radio transmitters rather than nuclear warheads. The missiles, however, are commonly counted as part of the strategic force.

Minuteman III missiles with Mk-12 warheads at F.E. Warren AFB, Wyoming are being withdrawn on a one-for-one basis as MX missiles are deployed in silos. The last 20 MX missiles will be operational by the end of 1988.

11. Soviet ICBMs (December 1987)

Missile	Launchers	Throwweight Per Missile (1000 lbs)	Total Mt	Warhead Force Levels	Total Stockpile
SS-11 Sego	394	2.5	422.9	814	900
M2	(184)		(202.4)	(184)	(200)
M3	(210)		(220.5)	(630)	(700)
SS-13 Savage	60	1.0-1.3	45.0	60	70
SS-17 M3 Spanker	139	6.4-7.0	417.0	556	610
SS-18 M4 Satan	308	16.7	1694.0	3080	3400
SS-19 M3 Stiletto	360	7.5-8.0	1188.0	2160	2400
SS-24 Scalpel	5	8.0	5.0	50	55
SS-25 Sickle	126	1.6-2.2	69.3	126	140
Total	1392	10,400	3841.2	6846	7500

Warhead force levels represent those warheads on "on-line" missile launchers as well as those being kept for missiles in temporary overhaul, repair, conversion, and modernization. They do not include those warheads in storage which could be fitted to test missiles in storage or spare maintenance missiles, or potential reload missiles. Total stockpile is author's estimates of warhead force levels plus warheads which are maintenance spares and floats, or could be used for reloads.

Warhead levels represent one warhead per missile for SS-11 Modification 2 (M2), SS-13, and SS-25; three warheads for SS-11 Modification 3 (M3); four warheads for SS-17; six warheads for SS-19; and ten warheads for SS-18 and SS-24. Total stockpile, including approximately 10% additional warheads for spares and reloads, represent authors' rounded estimates of total stockpile size.

Soviet SS-11 and SS-17 missiles are being retired as new SS-24 and SS-25 missiles are deployed.

12. U.S. SLBMs (December 1987)

Missile/ Submarine	Number Submarines	Launchers	Throwweight Per Missile (1000 lbs)	Total Mt	Warhead Force Levels	Total Stockpile
Poseidon C3	16	256	3.3	102.4	2560	2700
Lafayette	(10)	(160)			(1600)	
B. Franklin	(6)	(96)			(960)	
Trident I C4	20	384	2.9	307.2	3072	3200
Lafayette	(6)	(96)			(768)	
B. Franklin	(6)	(96)			(768)	
Ohio	(8)	(172)			(1536)	
Total	36	640	1960	409.6	5632	5900

Warhead force levels represent those warheads on "on-line" missile launchers as well as those being kept for missiles in temporary overhaul, repair, conversion, and modernization. They do not include those warheads in storage which could be fitted to test missiles in storage or spare maintenance missiles, or potential reload missiles. Total stockpile is author's estimates of warhead force levels plus warheads which are maintenance spares and floats, or could be used for reloads.

Three Lafayette class submarines have been retired since 1985. The Fiscal Year 1988 Department of Defense Authorization Bill calls for the retirement of one additional submarine of this class. The next Ohio class submarine will be deployed in December 1989 with the Trident II D5 missile.

13. Soviet SLBMs (December 1987)

Missile/ Submarine	Number Submarines	Launchers	Throwweight Per Missile (1000 lbs)	Total Mt	Warhead Force Levels	Total Stockpile
SS-N-6 M3 Serb			1.6	544		
Yankee I	17	272			544	600
SS-N-8 Sawfly	24	292	1.8	438	292	320
Golf III[1]	(1)	(6)			(6)	
Hotel III[2]	(1)	(6)			(6)	
Delta I	(18)	(216)			(216)	
Delta II	(4)	(64)			(64)	
SS-N-17 Snipe			2.0	12		
Yankee II	1	12			12	15
SS-N-18 Stingray			2.5	672		
Delta III	14	224			1344	1500
SS-N-20 Sturgeon		80	3.0	56	560	620
Golf V[3]	1	(1)[4]			(0)	
Typhoon	4	(80)			(560)	
SS-N-23 Skiff			3.5	48		
Delta IV[5]	3	48			480	530
Total	64	928	1970	1770	3232	3600

Warhead force levels represent those warheads on "on-line" missile launchers as well as those being kept for missiles in temporary overhaul, repair, conversion, and modernization. They do not include those warheads in storage which could be fitted to test missiles in storage or spare maintenance missiles, or potential reload missiles. Total stockpile is author's estimates of warhead force levels plus warheads which are maintenance spares and floats, or could be used for reloads.

Force loadings represent one warhead per missile for SS-N-8 and SS-N-17; two warheads for SS-N-6; six warheads for SS-N-18; seven warheads for SS-N-20; and ten warheads for SS-N-23. Total, including approximately 10% additional warheads for spares and reloads, represents authors' rounded estimates of the stockpile.

Typhoon and Delta IV submarines are under construction or in sea trials. At least four more Typhoons are thought to be under construction. A fourth Delta IV hull was launched in January-Febuary 1987.

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1 The Golf III submarine was not SALT accountable; but the six launchers were SALT accountable.
2 The Hotel III submarine was not SALT accountable; but the six launchers were SALT accountable.
3 The Golf V test submarine is not counted as carring nuclear warheads.
4 The Golf V submarine is not counted in the total launcher number because it is unarmed.
5 The SS-N-23 missile may be backfit into Delta III class submarines, replacing the SS-N-18.

14. U.S. Strategic Bombers (December 1987)

Bomber/ Weapon Type	Number	Total Mt	Warhead Force Levels
B-52G/H	148	736.7	2994
Bombs		(394)	(788)
SRAMs		(100.6)	(592)
ALCMs		(242.1)	(1614)
B-52G/H	90	463.3	1188
Bombs		(396)	(792)
SRAMs		(67.3)	(396)
FB-111	56	131	336
Bombs		(112)	(224)
SRAMs		(19)	(112)
B-1B	64		
Bombs		256	512
Total	361	1587	5030[1]

Number of bombers represents operational forces. An additional 16 B-52G, 6 B-52H, 5 FB-111, and 12 B-1B bombers are in the total inventory.[2] Bomber warhead force levels are based on the following assumptions: ALCM-modified B-52G/Hs carry 12 ALCMs, five bombs and four SRAMs. Non-ALCM modified B-52G/Hs carry eight bombs and four SRAMs. FB-111s carry an average of four bombs and two SRAMs. B-1Bs carry an average of eight bombs.

Bomb loadings are those warheads on "on-line" Short-range attack missiles (SRAMs), Air-launched Cruise Missiles (ALCMs), and bombs, as well as those being kept for bombers in temporary overhaul, repair, conversion, and modernization. They do not include those warheads in storage which could be fitted to non-operatonal bombers or potential reloads. An additional 150 SRAMs, 101 ALCMs, and 684 strategic bombs are in the U.S. stockpile.

The B-1B is in production. The last 36 will be fully operational by mid-1988. The Advanced Technology Bomber (ATB), also known as the Stealth bomber, will be operational in the early 1990s.

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[1] An additional 40 operational SRAMs are distributed among the B-52 bomber force but do not show up due to rounding.

[2] This does not include over 200 B-52C/D/E/F bombers stored in inactive status at Davis-Monthan AFB, Arizona.

15. Soviet Strategic Bombers (December 1987)

Bomber/ Weapon Type	Number	Total Mt	Warhead Force Levels
TU-95 Bear A	30	120	
Bombs			120
TU-95 Bear B/C	30	240	
Bombs (or)		(150)	150
AS-3 missile		(90)	(30)
TU-95 Bear G	40	208	
Bombs		(160)	160
AS-4 missile		(48)	80
TU-95 Bear H	55	330	660
AS-15 missile		(110)	(440)
Bombs		(220)	(220)
Total	155	898	1170

Force loadings represent four bombs on Bear A; five bombs or one AS-3 on Bear B/C; four bombs and two AS-4s on Bear G; and eight AS-15 and four bombs on Bear H.

Bomb loadings are those warheads on "on-line" air-to-surface missiles (ASMs), AS-15 Air-launched Cruise Missiles (ALCMs), and bombs, as well as those being kept for bombers in temporary overhaul, repair, conversion, and modernization. They do not include those warheads in storage which could be fitted to non-operational bombers or potential reloads. Total stockpile is believed to include 50 percent additional spares and reloads for bombs; and 10 percent additional missiles and warheads for smaller AS-4 and AS-15 missiles.

Bear G and Bear H bombers are in production. The Bear G is replacing the Bear B/C. The Bear H is replacing the Bear A. The Blackjack bomber is undergoing development flight testing and is expected to be deployed next year.

TABLES 16-28

U.S. and Soviet Non-Strategic Nuclear Forces

16. U.S. Non-strategic Nuclear Weapons
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18. U.S. Nuclear Weapons in Europe
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27. U.S. Nuclear Capable Ships and Submarines
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16. U.S. Non-strategic Nuclear Weapons (December 1987)

Weapon Category	Weapon Types	Launchers Deployed	Total Stockpile
Land-based Aircraft			
Tactical Fighters	F-4, F-16, F-111	2252	1800
Naval/Marine Corps Aircraft			
Tactical Fighters	A-4, A-6, A-7, AV-8B, F/A-18	1106	1450
ASW Aircraft	P-3, S-3, SH-3	710	850
Missiles			
LRINF	GLCM, Pershing II	364	420
SNF	Lance	48	915
Artillery	155mm, 8-inch	3852	1690
Atomic Demolition Munitions	SADM	n.a.	300
Naval Weapons			
SLCMs	Tomahawk	51	150
ASW Weapons	ASROC, SUBROC	217	860
SAMs	Terrier	101	285
Total		---	8720

Launchers represent total inventory of non-strategic aircraft, operational missile launchers, total artillery guns, and nuclear capable ships and submarines. Warhead totals are rounded.

The table does not include allied delivery vehicles armed with U.S. nuclear warheads: Italian and West German Tornado aircraft; Belgian and Dutch F-16s; Italian and Turkish F-104 aircraft; Turkish F-4s; Dutch P-3s; Italian Atlantic ASW aircraft; Belgian, Italian, Dutch, British, and West German Lance missiles; Italian and West German Nike Hercules surface-to-air missiles; West German Pershing Ias; Belgian, British and West German 155mm artillery guns; and Belgian, Greek, Italian, Dutch, Turkish, British, and West German 8-inch artillery guns.

17. Soviet Non-strategic Nuclear Weapons (December 1987)

Weapon Category	Weapon Types	Launchers Deployed
Land-based Aircraft		
Bombers	Backfire, Badger, Blinder	325
Tactical Fighters	Fishbed L, Fitter A/D, Flogger, Fencer Frogfoot	3750
Naval Aircraft		
Bombers	Backfire, Badger, Blinder	370
Tactical Fighters	Fitter C	100
ASW Aircraft	Bear F, Mail, May, Hormone A, Helix A	400
Missiles		
SLBMs	SS-N-5	39
LRINF	SS-20, SS-4	553
SRINF	SS-12M, SS-23	160
Battlefield/SNF	Scud B, SS-21, FROG 7	1384
SAMs	unk	unk
Artillery	152mm, 203mm, 240mm	7040
Atomic Demolition Munitions	unk	unk
Naval Weapons		
ASMs	AS-2, AS-4, AS-5, AS-6	450
SLCMs	SS-N-3, SS-N-7, SS-N-9, SS-N-12, SS-N-19 SS-N-22	398
ASW Weapons	SS-N-15, SS-N-16, SUW-N-1, depth bombs, torpedoes	1401
SAMs	SA-N-1, SA-N-3, SA-N-6	256
Artillery	152mm	100
Coastal Missiles	SSC-1	100
Mines	unk	unk

Launchers represent total inventory of non-strategic aircraft, operational missile launchers, total artillery guns, and nuclear capable ships and submarines.

Aircraft delivered nuclear weapons include AS-2, AS-4, AS-5 and AS-6 air-to-surface missiles.

18. U.S. Nuclear Weapons in Europe

Type	May 1965	Dec 1981	Dec 1987	After INF (1992)
Artillery				
8-inch	975	938	738	240
155mm	-	732	732	732
Missiles				
Lance	0	(692)	(692)	(692)
Pershing Ia	(unk)	(293)	(100)	0
Pershing II	0	0	(108)	0
Honest John	(unk)	(198)	0	0
Total missiles	2400	1183	900	692
Bombs	1240	1929	1400	1400
Nuclear depth bomb	unk	192	192	192
Nike Hercules	990	686	100	0
Atomic Demolitions	340	372	0	0
GLCM	0	0	256	0
Total	5945	5840	4318	3256

The U.S. nuclear stockpile in Europe peaked in 1967 at 7200 warheads. Today, the 4318 warheads are split 2894 warheads for U.S. use and 1424 for allied use. With the withdrawal of Pershing Ia, Pershing II, and GLCMs as a result of the INF Treaty, the number of nuclear weapons in Europe will go down to 3,256, including the ongoing retirement of Nike Hercules and older 8-inch artillery warheads.

19. Soviet Short-range Nuclear Missiles in Europe (December 1987)

Weapon Type	Launchers	After INF (1993)
SS-20 Saber	270	0
SS-4 Sandal	112	0
SS-12M Scaleboard B	78	0
SS-23 Spider	36	0
SCUD B	~500	~500?
SS-21 Scarab	130	~500?
FROG-7	370	0?
Total	1496	~1000?

The SCUD B was deployed in 1965 and would have been withdrawn if the SS-23 Spider was produced. The SS-21 Scarab was deployed in 1976, and is replacing the FROG-7. It has already equipped all of the front-line Soviet divisions in Eastern Europe. The FROG-7 was deployed in 1965 and is being replaced by the SS-21.

20. U.S. Non-strategic Land-based Missiles (December 1987)

Weapon	Year Deployed	Range (km)	Warhead x yield (kt)	Total Launchers	Total Stockpile
Lance (MGM-52C)	1972	115	1 x 1-100	48[1]	915
Pershing II	1983	1800	1 x .3-80	126[2]	120
GLCM (BGM-109G)*	1984	2500	1 x .2-150	93[3]	300
Total				**267**	**1335**

* In Production

The Pershing Ia is operated by West Germany, even though the U.S. maintains custody and control of its nuclear warheads.

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1 This does not include 52 Lance launchers that are owned and operated by U.S. allies.
2 This includes 108 operational Pershing II launchers and 18 training launchers at Ft. Sill, Oklahoma.
3 This includes 64 operational GLCM launchers in Europe, eight non-operational launchers awaiting arming with warheads, and 21 training launchers at Davis-Monthan AFB, Arizona.

21. Soviet Non-strategic Land-based Missiles (December 1987)

Weapon	Year Deployed	Range (km)	Warhead x yield (kt)	Total Launchers
SS-N-5 Sark	1963	1400	1 x 1200-2000	39
SS-20 Saber*	1977	5000	3 x 250	441
SS-4 Sandal	1958	1770	1 x 1000	112
SS-12M Scaleboard B*	1979[1]	900	1 x 500	124
SS-23 Spider*	1985	500	1 x 100	36
SS-1c SCUD B	1965[2]	280	1 x 1-10	620
SS-21 Scarab*	1976	100	1 x 3-200	130
FROG-7[3]	1965	70	1 x 3-200	634
Total				2136

* In Production

The SS-N-5 Sark submarine-launched ballistic missile is not counted as a strategic weapon. It is deployed on 13 Golf II class submarines in the Baltic Sea and the Sea of Japan.

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1 The original SS-12 Scaleboard was deployed in 1969. It is assumed that new SS-12M Scaleboard B missiles have replaced all older Scaleboards.

2 The SCUD A missile was deployed in 1957. All SCUD As have been replaced by SCUD Bs.

3 Some of these missiles could be older FROG-3/5 launchers.

22. U.S. Nuclear Capable Aircraft (December 1987)

Type	Year Deployed	Number Deployed	Comment
Strategic Bombers			
B-52G/H STRATOFORTRESS	1955	263	Air Force long-range bomber being replaced by B-1B and ATB
FB-111A	1971	61	Air Force medium-range bomber to be replaced by ATB
B-1B*	1986	76	Air Force long-range bomber 100 by December 1988
Non-Strategic Fighters			
A-4M SKYHAWK	1956	110	Marine Corps short-range attack, being replacd by AV-8B
A-6E INTRUDER*	1963	279	Navy/Marine Corps carrier based long-range attack, first of 120 A-6F models scheduled in 1991
F-4D/E PHANTOM II	1964	857	Air Force medium-range fighter, being replaced by F-16/F-15
A-7E CORSAIR II	1967	240	Navy carrier based medium-range attack, being replaced by F/A-18
F-111A/D/E/F	1968	295	Air Force long-range fighter
F-16A/B/C/D* FALCON	1979	1100	Air Force medium-range fighter
F/A-18A/B* HORNET	1983	385	Navy/Marine Corps medium-range carrier-based fighter replacing F-4 and A-7
AV-8B* HARRIER II	1985	92	Marine Corps medium-range fighter replacing AV-8C and A-4
ASW Aircraft			
SH-3D/H SEA KING	1961	140	Navy carrier based ASW helicopter, to be replaced by SH-60F
P-3A/B/C* ORION	1962	383	Navy long-range maritime patrol/ASW aircraft
S-3A/B VIKING	1974	187	Navy medium-range carrier-based ASW aircraft
Total		4468	

In over four decades the U.S. has had 43 kinds of aircraft capable of delivering nuclear weapons. Fourteen of these are currently deployed and listed above. Since 1945 twenty six types of gravity bombs, five types of air-to-surface missiles, and two types of air-to-air weapons have been part of the US aircraft nuclear weapons inventory. The current U.S. nuclear bomb stockpile of six types is estimated to be 7,475 supplemented by 2,875 air-launched missile warheads (ALCMs and SRAMs).

* In Production

Aircraft are listed chronologically in order of operational deployment. Numbers represent total inventory of aircraft including operational, training, reserve and backup aircraft. Not all nuclear capable aircraft have nuclear missions and thus the number listed here is lower than the total number of aircraft of each type.

23. Soviet Nuclear Capable Aircraft (December 1987)

Type	Year Deployed	Number Deployed	Comment
Strategic Bombers			
Tu-95 BEAR A/B/C/G/H*	1955	155	Air Force long-range bomber, BEAR H in production
Non-Strategic Fighters/Bombers			
Tu-16 BADGER A/C/G	1954	482	Air Force/Navy medium-range bomber
MIG-21 FISHBED L	1956	135	Air Force medium-range fighter, being replaced by MIG-27 FLOGGER D/J and Su-24 FENCER
Su-7 FITTER A	1959	80	Air Force short-range fighter, being replaced Su-17 FITTER and Su-24 FENCER
Tu-22 BLINDER A/B	1962	165	Air Force/Navy medium-range bomber
Su-17/20 FITTER C/D	1972	875	Air Force/Navy medium-range fighter, replacing Su-7 FITTER A
Tu-26 BACKFIRE A/B/C*	1974	290	Air Force/Navy medium-range bomber, replacing Tu-16 BADGER
Su-24 FENCER A/B/C/D*	1974	800	Air Force medium-range fighter, replacing Su-7 FITTER A and Su-17 FITTER D
MIG-27 FLOGGER D/J*	1975	810	Air Force medium-range fighter
ASW Aircraft			
Be-12 MAIL	1966	95	Navy land-based ASW and maritime patrol aircraft
Ka-25 HORMONE A	1967	140	Navy ship-based ASW helicopter
Il-38 MAY	1968	60	Navy land-based ASW and maritime patrol aircraft
Tu-142 BEAR F*	1970	55	Navy land-based long-range ASW and maritime patrol aircraft
Ka-27 HELIX A*	1982	50	Navy ship-based ASW helicopter
Total		4,192	

Soviet aircraft are designated here by both Soviet and NATO names. The Soviets assign each aircraft a designation based on the Experimental Design Bureau from which it came, which are named for weapon designers. In the above list: Be stands for Berlev; Ka = Nikolay I. Kamov; Il = Sergei Ilyushin: MIG = Artem I. Mikoyan and Mikhail I. Gurevich; Su - Pavel O. Sukhoi; Tu = Andrei Tupolev; Mya = Vladimir Myasishchev, followed by a number that specifies the design order. NATO assigns a code name, the first letter of which indicates the type; B = bomber, F = fighter, H= helicopter, M = multipurpose aircraft. Jet aircraft are given multisyllabic names (FLOGGER), propeller-driven aircraft one-syllable names (BEAR). Letters after the code name show new modifications.

* In Production

Aircraft are listed chronologically in order of operational deployment. Numbers represent total inventory of aircraft including operational, training, reserve and backup aircraft. Not all nuclear capable aircraft have nuclear missions and thus the number listed here is lower than the total number of aircraft of each type.

24. U.S. and Soviet Nuclear Capable Artillery (December 1987)

Weapon Type	Year Deployed	Range (km)	Launchers Deployed	Total Warheads
United States				
M-109 155mm	1962	30	2238	} 785[1]
M-198 155mm	1979	30	585	}
M-114 155mm	1942	20	n.a.	}
M-110 203mm	1961	30	1029	758[2]
subtotal			3852	1543
Soviet Union				
152mm[3]	1973	28.5	6300	unk
203mm[4]	1977	30	390	unk
240mm[5]	1955	10	350	unk
Total			7040	unk

More than 30 percent of the U.S. M-110 artillery guns, and 45 percent of the M-109 artillery guns are nuclear certified. It is unknown how many Soviet nuclear artillery projectiles have been produced and deployed.

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1 These W48 155mm nuclear artillery projectiles are earmarked for U.S. use. An additional 140 are stored in Europe for allied use.

2 An additional 332 W-33 8-inch nuclear artillery projectiles are stored in Europe for allied use.

3 The 152mm nuclear capable guns include the M-1976, 2S3 (M-1973), and 2S5 (M-1981). The M-1943 (D-1) and M-1955 (D-20) are possibly nuclear capable.

4 The 203mm guns include the 2S7 (M-1975) and the M-1980. The M-1955 (M55) is possibly nuclear capable.

5 The 240mm nuclear artillery mortars include the M-240 and the 2S4 (M-1975).

25. U.S. Naval Nuclear Weapons (December 1987)

Weapon Category/ Type	Year Deployed	Range (km)	Total Stockpile	Aircraft/ Ship Class
Bombs				
B43, B57, B61	1961[1]	n.a.	1450	A-4, A-6, A-7, AV-B, F/A-18
Sea-launched Cruise Missiles				
Tomahawk	1984	2600	150	Iowa, Long Beach, Virgina, Ticonderoga, Spruance, Los Angeles, Sturgeon
ASW Weapons				
ASROC	1961	1-10	575	All cruisers except later Ticonderoga class, all destroyers and frigates except Perry class.
SUBROC	1965	55	285	Los Angeles, Sturgeon, Permit
B57 depth bombs	1963	n.a.	900	P-3, S-3, SH-3
subtotal			1760	
SAMs				
Terrier	1956	40	285	Leahy, Belknap, Bainbridge, Truxton, Long Beach, Farragut
Total			3645	

[1] This is the year the B43 bomb became operational.

26. Soviet Naval Nuclear Weapons (December 1987)

Weapon Category/ Type	Year Deployed	Range (km)	Missiles Deployed	Total Warheads	Aircraft/ Ship Class
Aircraft Weapons (Strike)					
ASMs[1]	1961	n.a.	unk	450	Badger, Backfire, Blinder
Sea-launched Cruise Missiles					
SS-N-3 Shaddock	1960	450	228	120	Echo II, Juliet, Kresta I, Kynda
SS-N-7 Starbright	1968	65	90	44	Charlie I, Papa
SS-N-9 Siren	1969	280	208	78	Charlie II, Papa, Nanuchka, Sarancha
SS-N-12 Sandbox	1976	550	200	76	Kiev, Slava, Echo II
SS-N-19 Shipwreck	1980	550	136	56	Kirov, Oscar
SS-N-22 Sunburn	1981	100	80	24	Sovremennyy, Tarantul III
subtotal			942	398	
ASW Weapons					
SS-N-15 Starfish	1973	37	unk	}400	Typhoon, Charlie I/II, Papa, Oscar, Romeo,
SS-N-16	1979	120	unk	}	Tango, Victor I/II/III, Alfa, Sierra, Mike, Akula
FRAS-1/SUW-N-1	1967	30	25	25	Kiev, Moskva
torpedoes	1980s	unk	n.a.	576	Virtually all ships and submarines
depth bombs	1980s	n.a.	n.a.	400	Bear F, Helix A, Hormone A, Mail, May
subtotal			unk	1401	
Other Naval Weapons					
SAMs[2]	1961	55	unk	256	Kiev, Moskva, Kirov, Slava, Kara, Kresta I/II, Kynda, Kanin, Mod. Kashin, SAM Kotlin
Artillery (152mm)	unk	18	unk	100	Sverdlov
SSC-1b Sepal	1962	450	unk	100	land-based
Mines	unk	n.a.	unk	unk	attack submarines?
Total			---	2705	

Total nuclear stockpile respresents two SLCMs per ship, except on Kiev and Kirov class, which get four; four SLCMs per submarine, except Oscar class which get 12; four SS-N-15 and SS-N-16 per submarine; one nuclear torpedo average per ship/submarine; one ASW nuclear depth bomb per nuclear capable ASW aircraft and helicopter; four surface-to-air missile nuclear warheads per ship.

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1 Includes the AS-4 Kitchen, AS-5 Kelt, and AS-6 Kingfish missiles. A new nuclear capable missile, the AS-11 Kilter is reportedly being deployed.

2 This includes SA-N-1 Goa, SA-N-3 Goblet, and SA-N-6 Grumble. The SA-N-2 Guideline and the SA-N-7 Gadfly could be nuclear capable.

27. U.S. Nuclear Capable Ships and Submarines

Type/ Class	Number Deployed	Nuclear Weapons
Ballistic Missile Submarines		
Lafayette	16	Poseidon C-3, Trident I C-4
Franklin	12	Poseidon C-3, Trident I C-4
Ohio	8	Trident I C-4
subtotal	36	
Non-strategic Submarines		
Attack		
Los Angeles	29	Tomahawk, SUBROC
Sturgeon	37	Tomahawk, SUBROC
Permit	13	SUBROC
subtotal	79	
Surface Ships		
Aircraft Carriers		bombs, nuclear depth bombs
Midway	2	
Forrestal	3	
Kitty Hawk	4	
Enterprise	1	
Nimitz	4	
Tarawa	5	
subtotal	19	
Battleships		
Iowa	3	Tomahawk
subtotal	3	
Cruisers		
Leahy	9	Terrier, ASROC
Belknap	9	Terrier, ASROC
Long Beach	1	Terrier, ASROC, Tomahawk
Bainbridge	1	Terrier, ASROC
Truxton	1	Terrier, ASROC
California	2	ASROC
Virginia	4	ASROC, Tomahawk
Ticonderoga	9	ASROC (through CG-51), Tomahawk (CG-52 and later)
subtotal	36	
Destroyers		
Spruance	31	ASROC, Tomahawk
Adams	23	ASROC
Farragut	10	Terrier, ASROC
Kidd	4	ASROC
subtotal	68	

Frigates		
Bronstein	2	ASROC
Garcia	10	ASROC
Knox	39	ASROC
Glover	1	ASROC
Brooke	6	ASROC
subtotal	58	
Total	299	

There are 20 surface ships and 31 attack submarines that are capable of launching the nuclear armed version of the Tomahawk at the end of 1987.

28. Soviet Nuclear Capable Ships and Submarines

Type/ Class	Number Deployed	Nuclear Weapons
Ballistic Missile Submarines		
Golf II	13	SS-N-5
Golf III	1	SS-N-8
Golf V	1	(SS-N-20)[1]
Hotel III	1	SS-N-8
Yankee I	17	SS-N-6
Yankee II	1	SS-N-17
Delta I	18	SS-N-8
Delta II	4	SS-N-8
Delta III	14	SS-N-18
Delta IV	3	SS-N-23
Typhoon	4	SS-N-20
subtotal	77	
Non-strategic Submarines		
Cruise missile		
Juliett	15	SS-N-3a
Echo II	26	SS-N-3a/c or SS-N-12
Charlie I	10	SS-N-7
Papa	1	SS-N-7 or SS-N-9
Charlie II	6	SS-N-9
Oscar	4	SS-N-19
Yankee conversion	(1)	SS-NX-24
subtotal	63	
Attack		all submarines carry nuclear torpedoes
Whiskey	49	
Zulu	1	
Romeo	4	possible SS-N-15/16
Foxtrot	43	
Tango	20	possible SS-N-15/16
Kilo	11	
November	12	
Hotel II	4	
Echo I	3	
Victor I	16	SS-N-15
Victor II	7	SS-N-15/16
Alfa	6	SS-N-15
Victor III	17	SS-N-16
Yankee conversion	2	
Sierra	2	SS-N-15/16
Mike	1	SS-N-15/16

[1] The SS-N-20 missile on this ship is not thought to be nuclear armed.

Akula	1	SS-N-15/16
subtotal	199	
Surface Ships		
Aircraft Carriers		
Kiev	3	FRAS-1/SUW-N-1, SS-N-12, ASW helicopters, SA-N-3, torpedoes
Moskva	2	
subtotal	5	
Cruisers		
Kirov	2	SS-N-3, SS-N-12, SS-N-19, SA-N-1, SA-N-3, SA-N-6, torpedoes, ASW helicopters
Slava	2	
Kara	7	
Kresta I	4	
Kresta II	10	
Kynda	4	
Sverdlov	10	naval artillery
subtotal	39	
Destroyers		
Sovremennyy	7	SS-N-22, SA-N-1, torpedoes, ASW helicopters
Udaloy	8	
Kildin/Mod. Kildin	4	
Kanin	6	
Kashin/Conv./Modified	19	
Kotlin/SAM Kotlin	23	
Skoryy	2	
subtotal	69	
Frigates		
Krivak	21	torpedoes
Krivak II	11	
Riga	35	
Grisha I/III/IV/V	51	
subtotal	118	
Patrol Combatants		
Nanuchka I	17	SS-N-9, SS-N-22, torpedoes
Nanuchka III	9	
Tarantul III	5	
Turya	31	
Sarancha	1	
subtotal	63	
Total	633	

TABLES 29-33

World Nuclear Capabilities

29. Allied Nuclear Capabilities in NATO
30. British Nuclear Forces
31. French Nuclear Forces
32. Chinese Nuclear Forces
33. British, French and Chinese Nuclear Capable Ships and Submarines

By comparison to the U.S. and the Soviet Union the nuclear arsenals of the U.K., France and China are relatively small. It is estimated that United Kingdom has 526 nuclear weapons, France 473 and China possibly as many as 389, for a total of approximately 1388 weapons or less than three percent of the world's total of over 55,000. An assumption is that each nuclear capable aircraft is nuclear armed with one weapon. The megatonnage is estimated to be 58 Mt for the UK, 121 Mt for France and up to 540 Mt for China for a total of 720 Mt or less than five percent of the world's total of approximately 15,000 Mt. The three nation's strategic weapons are targeted on the Soviet Union. These include up to 446 warheads on land and sea based ballistic missiles and another several dozen on aircraft.

All three nation's have programs under development that will increase the numbers of warheads. With the completion of the MIRVed x 8 Trident II missile program by the late 1990s the British strategic arsenal will grow four fold. With the completion of the MIRVing of 48 more French SLBMs by 1993 the strategic arsenal will rise to 544. Up to 40 new mobile S4 IRBMs and up to 120 Hades launchers could raise the French total to near 900 by the end of the century.

29. Allied Nuclear Capabilities in NATO

Weapon System	Belgium	Greece	Italy	Netherlands	Turkey	United Kingdom	West Germany	Total
Land-based aircraft								
Buccaneer S2	0	0	0	0	0	32	0	32
Tornado	0	0	54	0	0	200	160	414
F-16	36	0	0	36	0	0	0	72
F-4E	0	0	0	0	54	0	0	54
F-104	0	36	36	0	72	0	0	144
subtotal	36	36	90	36	126	232	160	716
ASW aircraft								
P-3C Orion	0	0	0	13	0	0	0	13
Atlantic	0	0	9	0	0	0	0	9
Nimrod MR2.P	0	0	0	0	0	32	0	32
subtotal	0	0	9	13	0	32	0	54
Battlefield Missiles								
Lance	4	0	6	6	0	12	24	52
Pershing Ia	0	0	0	0	0	0	72	72
Surface-to-air Missiles								
Nike Hercules	0	0	~100	0	0	0	~100	~200
Artillery (certified guns)								
155mm	36	0	0	0	0	36	594	666
8-inch	8	24	16	8	32	12	84	184

The U.S. stores 1,424 nuclear warheads in Europe for allied use: 321 nuclear bombs, 63 B57 nuclear depth bombs, 368 Lance warheads, 100 Pershing Ia warheads, 100 Nike Hercules warheads, 140 155mm nuclear artillery projectiles, and 332 8-inch artillery projectiles. The U.S. provides nuclear depth bombs for the British Nimrod ASW aircraft, artillery guns and Lance missiles, but the British provides their own nuclear bombs for their Tornado and Buccaneer fighters.

In September 1983, Turkey announced its decision to purchase and co-produce 160 F-16C/D aircraft. The first were delivered in July and the planes will become operational next year replacing F-4s and F-104s. In January 1987, Greece signed a contract to purchase 40 F-16C/Ds to replace their F-104s. Pershing Ia missiles and warheads will be eliminated in agreement with the U.S.-Soviet INF Treaty. The remainder of the Nike Hercules warheads will be retired in 1988. Allied 8-inch nuclear roles are being reduced and more 155mm guns are being certified to fire nuclear shells.

30. British Nuclear Forces (December 1987)

Weapon System	Number Deployed	Year Deployed	Range (km)	Warhead Type x yield (kt)	Total Warheads
Aircraft					
Buccaneer S2	32	1962	1700	1 WE-177 bomb x 5-200	32
Tornado GR-1	200	1982	1300	1-2 WE-177 bomb x 5-200 or second unknown bomb type	200
SLBMs					
Polaris A3-TK	64	1982	4700	2 x 40 (MRV)	128
Carrier Aircraft					
Sea Harrier FRS.1	29	1980	450	1 WE-177 bomb x 5-200	30[1]
ASW helicopters					
Sea King HAS 5	61	1976	n.a.	1 x depth bombs[2]	61
Lynx HAS 2/3	75	1976	n.a.	1 x depth bombs	75
Total warheads					526
Total Megatonnage					58 Mt

British systems certified to use U.S. nuclear weapons include 34 Nimrod MR.2P ASW aircraft, 12 Lance launchers (one regiment), 12 M110 8-inch howitzers, and 36 M109 155mm howitzers. There are a total of 136 artillery guns in five regiments (120 M109 and 16 M110 Howitzers) based in West Germany that could be certified.

Total warheads assumes that each nuclear delivery system is nuclear armed. Some sources put the total number of nuclear warheads in the British stockpile as low as 185 warheads, comprised of: 80 WE-177 gravity bombs, 25 nuclear depth bombs, and 80 Chevaline A3-TK warheads.

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1 There is some doubt as to whether the Sea Harrier is allocated nuclear weapons.
2 The Royal Navy nuclear depth bomb is believed to be a low yield variation of the WE-177 tactical bomb.

31. French Nuclear Forces (December 1987)

Weapon System	No. Deployed	Year Deployed	Range (km)	Warhead Type x yield (kt)	Total Warheads
Aircraft					
Mirage IVP/ASMP	18	1986	1500	1 TN-80 x 300	18
Jaguar A	45	1974	750	1 ANT-52 x 6-8, 30	45
Mirage IIIE	30	1972	600	1 ANT-52 x 6-8, 30	30
Land-based missiles					
S3D	18	1980	3500	1 TN-61 x 1000	18
Pluton	44	1974	120	1 ANT-51 x 10, 25	70
Submarine-based missiles					
M-20	64	1977	3000	1 TN-61 x 1000	64
M-4A	16	1985	4000-5000	6 TN-70 x 150	96
M-4 (modified)	16	1987	6000	4-6 TN-71 x 150 (MIRV)	96
Carrier aircraft					
Super Etendard	36	1978	650	1 ANT-52 x 6-8, 30	36
Total warheads					473
Total Megatonnage					121 Mt

The newly deployed ASMP air-to-surface missile has a range of 80-250 kilometers. The ASMP will replace the ANT-52 bomb on the Super Etendard in 1988.

32. Chinese Nuclear Forces (December 1987)

Weapon System	No. Deployed	Year Deployed	Range (km)	Warhead x yield (kt)	Total Warheads
Aircraft					
Il-28 Beagle (B-5)	15-30	1974	1850	1 x bombs	15-30
Tu-16 Badger (B-6)	100	1966	5900	1-3 bombs	100-130
Land-based missiles					
CSS-1 (DF-2)	40-60	1966	1100	1 x 20	40-60
CSS-2 (DF-3)	85-125	1972	2600	1 x 2000-3000	85-125
CSS-3 (DF-4)	~ 10	1978	7000	1 x 1000-3000	10
CSS-4 (DF-5)	~ 10	1980	12000	1 x 4000-5000	10
Submarine-based missiles					
CSS-N-3	24	1983	3300	1 x 200-1000	24
Total warheads					284-389
Total Megatonnage					~420-540 Mt

33. British, French, and Chinese Nuclear Capable Ships and Submarines

Type/ Class	Number Deployed	Nuclear Weapons
British		
Ballistic Missile Submarines		
Resolution	4	Polaris A-3TK
Surface Ships		
Aircraft Carriers	3	bombs, nuclear depth bombs
Invincible		
Destroyers	12	nuclear depth bombs
Type 42		
Frigates	8[1]	nuclear depth bombs
Type 22		
Total Britain	27	
French		
Ballistic Missile Submarines		
Redoubtable	5	M4 (modified), M20
Inflexible	1	M4A
subtotal	6	
Surface Ships		
Aircraft Carriers		
Clemenceau	2	bombs
Total France	8	
China		
Ballistic Missile Submarines		
Golf	1	not armed
Xia	3	CSS-N-X-3
Total China	4	

[1] There are six additional Type 22 Frigates under construction or in sea trials.

TABLES 34-37

Nuclear Weapons Research and Development

34. Nuclear Weapons and Delivery Systems in Production (December 1987)
35. Nuclear Weapons and Delivery Systems under Development
36. Introduction of New U.S. and Soviet Nuclear Weapons, 1960-1987
37. Nuclear Tests, 1945-1987

34. Nuclear Weapons and Delivery Systems in Production (December 1987)

United States

MX/Peacekeeper ICBM/W-87 warhead
50 missiles in silos by the end of 1988
Ohio class SSBN
Next submarine (number 9) to be deployed in December 1989 with Trident II D5 missiles. With the Fiscal Year 1988 Defense budget, 15 total submarines have been authorized for procurement.
B-1B bomber
100 bombers to be deployed by mid-1988.
B61-3/4 bomb
Replacing older Air Force, Navy, and NATO-allocated bombs
B83 bomb
New strategic high yield bomb arming all bombers
Ground-launched cruise missile/W84 warhead
464 planned in total program, approximately 300 warheads procured as of end 1987.
F-16C/D Falcon
2,737 U.S. Air Force aircraft planned through the 1990s, approximately 1,100 deployed.
F/A-18A/B Hornet
1,168 U.S. Navy and Marine Corps planned through the 1990s, approximately 385 deployed.
A-6E/F Intruder
345 U.S. Navy planned through the 1990s, approximately 279 deployed.
AV-8B Harrier II
234 U.S. Marine Corps planned through the 1990s, approximately 92 deployed.
P-3C Orion
New production aircraft augmenting attrition.
Tomahawk Sea-launched cruise missile/W80-0 warhead
758 nuclear versions planned by the mid-1990s
Artillery guns
Both M-198 and M-109 guns are in production.

Soviet Union

SS-24 Scalpel ICBM
Being deployed in rail mobile version, silo deployment possible
SS-25 Sickle ICBM
Being deployed in mobile version
SS-N-20 Sturgeon SLBM
Being deployed on Typhoon class submarines
Typhoon class SSBN
An additional 3-4 submarines are in sea trials or under construction
SS-N-23 Skiff SLBM
Being deployed on the Delta IV submarines; could be deployed on the Delta III class
Delta IV class SSBN
An addition 2-3 are in sea trials or under construction
AS-15 Kent ALCM
Being deployed on the Bear H bombers; could be deployed on the Blackjack and Backfire
Bear G/H bomber
Newly produced Bear H and modified Bear G bombers are replacing older Bears
Blackjack bomber
In limited production, but not yet deployed, IOC: 1988
Gazelle

Relacing Improved Galosh missile in Moscow ABM system

Tu-26 Backfire C

Being deployed with Strategic Aviation and Soviet Naval Aviation

Su-24 Fencer D

Being deployed with Frontal Aviation

MIG--27 Flogger D/J

Being deployed with Frontal Aviation

SS-20 Mod 2

This is a new and more accurate version of the SS-20 missile.

SS-12M Scaleboard B

Replacing the SS-12.

SS-23 Spider

Replacing the SCUD B.

SS-21 Scarab

Replacing the FROG-7.

152mm artillery

Two or three versions are in production.

203mm artillery

Two or three versions are in production.

SA-10 Grumble

Replacing older surface-to-air missiles in Strategic Defensive forces.

SA-N-6 Grumble

Arming larger naval vessels.

SLCMs

A wide variety are in production arming ships and submarines.

Tu-142 Bear F

Helix A ASW helicopter

Replaces the Hormone A ASW helicopter, armed with nuclear depth bomb

United Kingdom

Tornado GR.1

220 planned through 1989

Type 22 Frigates

six under construction or in sea trials

France

M4 variants

Three additional Redoubtable class SSBNs will be upgraded

ASMP

Arming the Mirage IVP, will arm the Super Etendard and the Mirage 2000N in 1988

China

M-9/SST-600 missile

600 km range mobile ballistic missile, IOC: 1987-1988

35. Nuclear Weapons and Delivery Systems Under Development (December 1987)

United States

Advanced Cruise Missile (AGM-129)
Augments ALCM (AGM-86B), for B-1B and Advanced Technology Bomber, IOC: 1990
Trident II SLBM with W88 warhead
For 20-25 Ohio class SSBNs to augment and replace Trident I, IOC: December 1989
Small ICBM with W87 warhead
New capability, mobile, single circa 500 kt W87 variant warhead missile, IOC: end 1992
Short-Range Attack Missile (SRAM) II
Replaces SRAM A, 1633 to be purchased, IOC: April 1993
Advanced Technology Bomber
"Stealth" bomber, replaces B-52, 132 to be purchased, IOC: 1992-1993
Earth Penetrator Weapons
New strategic bombs and/or cruise missile warheads to destroy buried targets, IOC: 1990s
Strategic Relocatable Targeting (SRT) weapons
Exploration of "conventional nuclear effects" or "advanced nuclear effects" to destroy mobile systems, IOC: 1990s
"Hard Target Kill" warhead
New warhead for bombers and/or ICBMs, IOC: 1990s
Maneuvering Reentry Vehicle (MaRV)
Option for strategic missiles to improve accuracy and penetration, IOC: 1990s
Nuclear Driven Directed Energy Weapons (NDEWs)
Option for ballistic missile defense using hypervelocity pellets, X-ray lasers, electromagnetically generated weapons
F-15E Strike Eagle
Augments and replaces F-111s in nuclear roles, IOC: late 1988
Long-range Air ASW Capable Aircraft (LRAACA)
To replace the P-3 Orion, IOC: 1990s
SH-60F Seahawk
Replaces the SH-3D/H carrier-based ASW helicopters, IOC: 1989
Wasp class (LHD-1) amphibious assault ships
Replaces Iwo Jima class, carries AV-8B Harrier II aircraft and supports Marine Corps, IOC: 1989
Burke class (DDG-51) guided missile destroyer
Tomahawk and ASROC capability, IOC: 1989
M-785/W82 Artillery Fired Atomic Projectile (AFAP)
Augments and replaces M-454/W48 155mm artillery projectile, IOC: 1990-1991
A-6F Intruder
Replaces A-6E carrier-based bombers, IOC: 1991
Standard-2 (Nuclear)/W81
May replace Terrier/W45 surface-to-air missile, IOC: 1990s
Seawolf class (SSN-21) attack submarine
Tomahawk and Sea Lance capability, IOC: 1994
Nuclear Depth/Strike Bomb (ND/SB)
Replaces B57 ASW/strike nuclear bomb, IOC: early 1990s
Sea Lance (N) ASW Standoff Weapon
To replace W55 SUBROC and W44 ASROC, dual capable weapon for submarine delivery, IOC: mid 1990s
Advanced Tactical Fighter (ATF)
May replace F-16 in Air Force, about 1000 to be purchased, IOC: 1995
Advanced Tactical Aircraft (ATA)
To replace A-6 and A-7 in the Navy, IOC: mid 1990s
SV-22 Osprey

Replaces S-3 Viking carrier-based ASW aircraft, 300 to be purchased, IOC: 1996

Follow-on to Lance (FOL)
To Replace Lance short-range missile in the Army and allied countries, IOC: late 1990s

New Tactical Bombs
Replaces B43, B57 and B61, three programs: Advanced Tactical Air Delivered Weapon, Tactical Air-to-Surface Missile, and new naval bomb

Soviet Union

Blackjack A strategic bomber
Replaces Bison and Bear A bombers, IOC: 1988-1989

Improved AS-15 (BL-10?) ALCM
Supersonic air-launched cruise missile variants for Blackjack A and Bear H, IOC: 1990s

SS-18 Mod 4 Follow-on (sometimes called the SS-X-26 or TT-09)
Replaces SS-18, liquid propellant, with increased accuracy and throw weight, test flights begun, IOC: 1990s

SS-N-20 modified SLBM
Replaces SS-N-20s on Typhoon SSBNs, IOC: 1990s

SS-N-23 follow-on

SS-24 silo-based missile
May be fitted in SS-17 or SS-19 silos

SS-24 Follow-on
Solid propellant missile under development, IOC: 1990s

New class of SSBNs
IOC: early 1990s

Improved accuracy SS-20 (SS-20 Mod 2)
Replaces current SS-20, also follow-on missile (SS-28?), IOC: 1987-1988

SS-NX-21 Sampson SLCM
New subsonic sea-launched cruise missile, IOC: about 1988

Brezhnev class
New large deck, 65,000 ton aircraft carrier, IOC: 1989-1990

SA-X-12B Giant
New mobile surface-to-air missile, with anti-cruise and anti-tactical ballistic missile capabilities, IOC: late 1980s

SS-CX-4 GLCM
New subsonic, ground-launched cruise missile, IOC: 1988-1989

SS-NX-24 large SLCM
New large, supersonic sea-launched cruise missile for modified Yankee-class SSGNs, IOC: 1988-1989

SS-CX-5? large GLCM
New large, supersonic ground-launched cruise missile, IOC: early 1990s

United Kingdom

Vanguard class SSBN
Replaces Resolution class, IOC: early 1990s

Trident II (D5) SLBM
Replaces Polaris A3TK, IOC: early 1990s

Air-to-surface missile
Replaces WE-177 in Air Force, possible modified Trident warhead or collaboration with France or the U.S., IOC: mid 1990s

EH 101 ASW helicopter
Replaces current ASW helicopters, to be deployed on Type 23: IOC: early 1990s

Type 23 Frigate

Will carry ASW helicopters, IOC: early 1990s

Nuclear depth/strike bomb
Replaces Royal Navy WE-177 bombs, common bomb with Air Force

France

S4 IRBM (mobile)
Replaces and/or supplements S3D silo-based IRBMs and Mirage IVP, IOC: 1996

"New generation" SSBN
Replaces Redoutable class, to carry M4 or M5 SLBMs, IOC: 1994

M4 SLBM modifications
First new TN-71 warhead, IOC: 1987. Then new TN-75 warhead, IOC: 1994

M5 SLBM
Replaces all M4s, uses TN-76 warhead, IOC: late 1990s

ASLP long range attack missile
Modified ASMP missile, with TN-81 warhead, IOC: 1988

Hades short-range ballistic missile
Replaces Pluton, may be equipped with enhanced radiation warhead, IOC: 1992

Charles de Gaulle aircraft carrier (CVN)
Replaces Clemenceau class, two planned, IOC: 1996

Mirage 2000N
Replaces the Jaguar A and Mirage IIIE in nuclear strike role with ASMP air-to-surface missile with new TN-81 warhead, IOC: 1988

Rafale
Replaces current nuclear capable tactical aircraft, IOC: 1998

TN-81 warhead
Improved warhead for the ASMP, IOC: 1988

Neutron bomb
Probable warhead for the Hades missile

China

CSS-NX-4 SLBM
Successor to CSS-N-3 on Xia (Daqingyu) class SSBNs, IOC:1990s

CSS-X-5 (Dong Feng 6) ICBM
Replaces CSS-4, IOC: 1990s

This list depicts the known programs of the five major nuclear powers to expand, upgrade and modernize their nuclear weapons arsenals. According to the Joint Chiefs of Staff Military Posture Statement for FY 1988, "The Soviets have more than 30 new strategic offensive systems in various stages of development." Several trends are discernible. Both the U.S. and the Soviet Union continue to emphasize mobile systems which make it difficult for the other to target. Not surprisingly the U.S. (and no doubt the Soviet Union) are also exploring new concepts to destroy each others mobile systems. Many of the future weapons will have greater accuracies, longer ranges, and employ "stealth" characteristics.

36. Introduction of New U.S. and Soviet Nuclear Weapons, 1960-1987

U.S.	Soviet
1960	
Polaris A1 (UGM-27A)/W47 warhead	SS-N-3c Shaddock
Titan I (HGM-25A)	Su-7 Fitter A
Hound Dog (AGM-28)	
Snark (SM-62)	
B-58 Hustler	
B41 bomb	
Little John (MGR-3)	
F-105D Thunderchief	
F-106B Delta Dart	
F4H-1/F-4B Phantom	
ASTOR	
Adams class (DDG-2)	
Farragut class (DDG-37)	
1961	
B-52H Stratofortress	Bear B
Atlas E (CGM-16E)/W38 warhead	AS-2 Kipper
Ethan Allen (SSBN-608)	AS-3 Kangaroo
B43 bomb	Juliet class SSGN
F-4C Phantom II	
A3J-1/A-5A Vigilante	
SH-3A Sea King	
Davy Crockett (M-28/29)/W54 warhead	
Falcon (AIM-26A)/W54 warhead	
M110 8-inch howitzer	
AD-6,7/A-1H,J Skyraider	
ASROC (RUR-5A)/W44 warhead	
Kitty Hawk class (CV-63)	
Enterprise class (CVN-65)	
Long Beach class (CGN-9)	
1962	
Titan II (LGM-25A)/W53 warhead	SS-N-3a Shaddock
Atlas F (HGM-16F)	SS-N-3b Sepal
Minuteman I (LGM-30A)/W59 warhead	Tu-22 Blinder
Polaris A2 (UGM-27B)	Echo II class SSGN
B53 bomb	Kynda class GG
Little John (MGR-3A)	Kashin DDG
Falcon (AIM-26B)	
F-104G Starfighter	
Sergeant (MGM-29)/W52 warhead	
W45 Medium Atomic Demolition Munition	
P-3A Orion	
Bainbridge class (CGN-25)	
Leahy class (CGN-16)	

1963	
U.S.	Soviet
Lafayette class (SSBN-616)	Bear C
Falcon (AIM-47A)	Golf II class SSB/SS-N-5 SLBM
A-6A Intruder	
B57 nuclear depth bomb	
W48 155mm artillery projectile	
Bronstein class (FF-1037)	

1964	
U.S.	Soviet
Polaris A3 (UGM-27C)/W58 warhead	Modified Kashin class DDG
Minuteman I (LGM-30A)/W56 warhead	
Pershing I (MGM-31A/B)W50 warhead	
RA-5C Vigilante	
B54 (W54) Special Atomic Demolition Munition	
Garcia class (FF-1040)	

1965	
U.S.	Soviet
SUBROC (UUM-44A)(Mk-128)/W58 warhead	AS-5 Kelt
Bullpup B (AGM-12B)	Converted Kashin
F-4 Phantom	SS-1C SCUD B missile
Belknap class (CG-26)	FROG-7 missile
Glover class (FF-1098)	

1966	
U.S.	Soviet
Minuteman II (LGM-30F)	SS-11 Mod 1
Brooke class (FFG-1)	Be-12 Mail ASW aircraft

1967	
U.S.	Soviet
Walleye I	Yankee I class SSBN/SS-N-6 Mod 1
A-7A Corsair II	AS-4 Kitchen
Sturgeon class (SSN-637)	Victor I class SSN
Truxton class (CGN-35)	Moskva class CHG
	Kresta I calss CG
	Tu-22 Blinder B
	Ka-25 Hormone A

1968	
U.S.	Soviet
F-111A	Charlie I class SSGN
B61-0,1 bomb	SS-N-7 Starbright
	Nanuchka I class PGG
	Grisha class FFG

1969	
U.S.	Soviet
Knox class (FF-1052)	SS-13 Mod 1
M-109A1 155mm self-propelled howitzer	Hotel III class SSBN
	SS-N-9 Siren
	Kresta II class CG

	SS-12 Scaleboard missile
1970	
U.S.	Soviet
Minuteman III (LGM-30G)/W62 warhead	AS-6 Kingfish
Poseidon C3 (UGM-73A)/W68 warhead	Echo I class SSN
Walleye (AGM-62)/W72 warhead	Krivak I class FFG
P-3C Orion	Tu-142 Bear F
1971	
U.S.	Soviet
FB-111 bomber	
1972	
U.S.	Soviet
SRAM (AGM-69A)/W69 warhead	Victor II class SSN
	MIG--23 Flogger
	Su-7 Fitter C
1973	
U.S.	Soviet
Lance (MGM-52)/W70-0,1,2 warhead	SS-11 Mod 2/3
	SS-13 Mod 2
	Delta I class SSBN/SS-N-8 Mod 1
	Delta II class SSBN/SS-N-8 Mod 1
	Yankee I class SSBN/SS-N-6 Mod 2/3
	Golf III class SSB
	Papa class SSGN
	Charlie II SSGN
	Kara class CG
	Tango class SS
	2S3 (M-1973) 152mm self-propelled howitzer
1974	
U.S.	Soviet
S-3A Viking	SS-18 Mod 1
Spartan (LIM-49)/W71 warhead	SS-19 Mod 1
Sprint/W-66 warhead	Tu-26 Backfire
California class (CGN-36)	Su-24 Fencer A
Lipscomb class (SSN-685)	
1975	
U.S.	Soviet
B61-2 bomb	SS-17 Mod 1/2
Nimitz class (CVN-68)	Golf V SSB
Spruance class (DD-963)	MIG-27 Flogger D
	Mig-23 Flogger B
	Kiev class CVHG
	Krivak II class FFG
	2S4 (M-1975) 240mm self-propelled mortar
1976	
U.S.	Soviet
Virginia class (CGN-38)	SS-18 Mod 2/3

		SS-N-12 Sandbox Su-17 Fitter D SS-21 Scarab missile
	1977	
U.S. A-6E TRAM Los Angeles (SSN-688) B61-5 bomb		Soviet SS-19 Mod 2 Delta III/SS-N-18 Mod 2 Nanuchka III class PGG Sarancha class PGGH SS-20 Saber 2S7 (M-1975) 203mm self-propelled howitzer
	1978	
U.S. M110A2 8-inch howitzer		Soviet Delta III/SS-N-18 Mod 1/3 SS-N-8 Mod 2 Golf V class SSB MIG-23 Flogger G Alfa class SSN
	1979	
U.S. Trident I C4 (UGM-96A)/W76 warhead Minuteman III/W78 warhead M-198 155mm howitzer Emory S. Land (AS-39)		Soviet SS-17 Mod 3 SS-18 Mod 4 SS-19 Mod 3 Victor III class SSN SS-12M Scaleboard B missile
	1980	
U.S. F-16 Falcon M-109A2 155mm self-propelled howitzer Yellowstone (AD-41)		Soviet Yankee II/SS-N-17 SS-N-19 Shipwreck Kirov class CGN Kilo class SS Su-25 Frogfoot M-1980? 203mm self-propelled howitzer
	1981	
U.S. ALCM (AGM-86B)/W80-1 warhead Kidd class (DDG-993) W79 8-inch enhanced radiation warhead W70 Lance missile enhanced radiation warhead		Soviet Oscar class SSGN SS-N-22 sunburn Sovremennyy class DDG Slava class CG Udaloy class DDG Tarantul III class PPG MIG-27 Flogger J Su-24 Fencer C 2S5 (M-1981) 152mm self-propelled howitzer
	1982	
U.S. Ohio class (SSBN-726)		Soviet Ka-27 Helix A

	1983	
U.S. Pershing II/W85 warhead Ground-launched Cruise Missile/W84 warhead B83 bomb F/A-18 Hornet Ticonderoga class (CG-47)		Soviet Typhoon/SS-N-20 M-1976 152mm towed artillery gun
	1984	
U.S. Tomahawk (BGM-109A)/W80-0 warhead		Soviet Bear G/H AS-15 Kent Yankee conversions (SSS/SSGN)
	1985	
U.S. B61-7 bomb AV-8B Harrier II		Soviet SS-25 Delta IV class SSBN/SS-N-23 SS-23 Spider short-range missile
	1986	
U.S. MX/Peacekeeper (LGM-118)/W87 warhead B-1B bomber		Soviet Sierra class SSN Mike class SSN
	1987	
U.S.		Soviet SS-24 Akula class SSN

37. Known Nuclear Tests, 1945-23 November 1987

Year	United States	Soviet Union	United Kingdom	France	China	Total
1945	3	0	0	0	0	3
1946	2	0	0	0	0	2
1947	0	0	0	0	0	0
1948	3	0	0	0	0	3
1949	0	1	0	0	0	1
1950	0	0	0	0	0	0
1951	16	2	0	0	0	18
1952	10	0	1	0	0	11
1953	11	4	2	0	0	17
1954	6	7	0	0	0	13
1955	18	5	0	0	0	23
1956	18	9	6	0	0	33
1957	32	15	7	0	0	54
1958	77	29	5	0	0	111
1959	0	0	0	0	0	0
1960	0	0	0	3	0	3
1961	10	50	0	2	0	62
1962	96	44	2	1	0	143
1963	43	0	0	3	0	46
1964	29	6	1	3	1	40
1965	29	9	1	4	1	44
1966	40	15	0	6	3	64
1967	29	17	0	3	2	51
1968	39	13	0	5	1	58
1969	29	16	0	0	2	47
1970	33	17	0	8	1	59
1971	15	19	0	5	1	40
1972	15	22	0	3	2	42
1973	12	14	0	5	1	32
1974	12	19	1	7	1	40
1975	17	15	0	2	1	35
1976	15	17	1	4	4	41
1977	12	18	0	6	1	37
1978	16	28	2	8	3	56
1979	15	29	1	9	0	54
1980	14	21	3	13	1	52
1981	16	22	1	12	0	50

1982	18	31	1	6	0	56
1983	17	27	1	7	2	54
1984	17	28	2	8	2	56
1985	17	9	1	8	0	34
1986	14	0	1	8	0	23
1987	12	19	1	7	1	40
Total	825[1]	615[2]	41[3]	161[4]	33[5]	1677[6]

[1] The U.S. does not announce all of its tests. As past seismic data is reviewed it is likely that more tests will be discovered.

[2] The total number of Soviet tests is unknown. According to the Swedish National Defence Research Institute (FOA) an additional 18 tests took place between 1949-1958 for which a breakdown by year is not available but are included in the total. The French Ministry of Defence has revealed additional Soviet tests for the period 1963-1977 but since the dates are not specified they have not been included.

[3] Since 1962 the U.K. has conducted 20 of its 41 tests jointly with the U.S. at the Nevada Test Site.

[4] In a French Ministry of Defence document it is stated that there were 69 French tests between 1963-1977. Most listings show 64 with specific dates. The additional five have been included in the total.

[5] In 1986 several official Chinese publications stated that China had conducted 32 nuclear tests since 1964, three more than the available data suggested. The three are included in the total. The French Ministry of Defence shows two tests in 1983, where most sources show only one.

[6] Includes one Indian test in 1974.

Index by Deployed Weapon

Il-38 May ASW aircraft	Soviet Union
Jaguar A aircraft	U.K.
Ka-25 Hormone A ASW helicopter	Soviet Union
Ka-27 Helix A ASW helicopter	Soviet Union
Lafayette class SSBN	U.S.
Lance missile	U.S., Belgium, Italy, Netherlands, U.K., West Germany
Lynx HAS 2/3 ASW helicopter	U.K.
M-4/M-4 (modified) SLBM	France
M-20 SLBM	France
MiG-21 Fishbed L aircraft	Soviet Union
MIG-27 Flogger D/J aircraft	Soviet Union
Minuteman II ICBM	U.S.
Minuteman III ICBM	U.S.
Mirage IIIE aircraft	France
Mirage IVP aircraft	France
MX/Peacekeeper ICBM	U.S.
Nike Hercules surface-to-air missile	Italy, West Germany
Nimrod MR2 ASW aircraft	U.K.
Ohio class SSBN	U.S.
P-3A/B/C Orion ASW aircraft	U.S., Netherlands
Pershing Ia missile	West Germany
Pershing II missile	U.S.
Pluton missile	France
Polaris A3-TK SLBM	U.K.
Poseidon C3 SLBM	U.S.
S-3A Viking ASW aircraft	U.S.
S3D MRBM	France
SA-1 Guild surface-to-air missile	Soviet Union
SA-2 Guideline surface-to-air missile	Soviet Union
SA-5 Gammon surface-to-air missile	Soviet Union
SA-10 Grumble surface-to-air missile	Soviet Union
SCUD B (SS-1C) missile	Soviet Union
Sea Harrier FRS-1 aircraft	U.K.
Sea King HAS 2/5 ASW helicopter	U.K.
SH-3D/H Sea King ASW helicopter	U.S.
Short-range Attack Missile (SRAM)	U.S.
Special ADM (SADM)	U.S.
SSC-1b Sepal coastal missile	Soviet Union
SS-11 Sego ICBM	Soviet Union
SS-12M Scaleboard B missile	Soviet Union
SS-13 Savage ICBM	Soviet Union
SS-17 Spanker ICBM	Soviet Union
SS-18 Satan ICBM	Soviet Union
SS-19 Stiletto ICBM	Soviet Union
SS-21 Scarab missile	Soviet Union
SS-20 Saber missile	Soviet Union
SS-23 Spider missile	Soviet Union
SS-24 Scalpel ICBM	Soviet Union
SS-25 Sickle ICBM	Soviet Union
SS-N-3 SLCM	Soviet Union
SS-N-5 SLBM	Soviet Union
SS-N-6 Serb SLBM	Soviet Union
SS-N-7 SLCM	Soviet Union

SS-N-8 Sawfly SLBM	Soviet Union
SS-N-9 Siren SLCM	Soviet Union
SS-N-12 Sandbox SLCM	Soviet Union
SS-N-15 ASW nuclear depth bomb	Soviet Union
SS-N-16 ASW missile	Soviet Union
SS-N-17 Snipe SLBM	Soviet Union
SS-N-18 Stingray SLBM	Soviet Union
SS-N-19 SLCM	Soviet Union
SS-N-20 Sturgeon SLBM	Soviet Union
SS-N-22 SLCM	Soviet Union
SS-N-23 Skiff SLBM	Soviet Union
Su-7 Fitter A aircraft	Soviet Union
Su-17/20 Fitter C/D aircraft	Soviet Union
Su-24 Fencer A/B/C/D aircraft	Soviet Union
SUBROC ASW missile	U.S.
Super Etendard aircraft	France
SUW-N-1/FRAS-1 ASW missile	Soviet Union
Terrier surface-to-air missile	U.S.
Tornado GR-1 aircraft	Italy, U.K., West Germany
Trident I C4 SLBM	U.S.
Tu-16 Badger bomber	Soviet Union
Tu-16 Badger (B-6) bomber	China
Tu-22 Blinder A/B bomber	Soviet Union
Tu-26 Backfire A/B/C bomber	Soviet Union
Tu-95 Bear A/B/C/G/H bomber	Soviet Union
Tu-142 Bear F ASW aircraft	Soviet Union
Typhoon class SSBN	Soviet Union
W31 Nike Hercules warhead	U.S.
W33 8-inch artillery projectile	U.S.
W44 ASROC warhead	U.S.
W45 Terrier warhead	U.S.
W48 155mm artillery projectile	U.S.
W50 Pershing Ia warhead	U.S.
W54 Special Atomic Demolition Munition	U.S.
W55 SUBROC warhead	U.S.
W56 Minuteman II warhead	U.S.
W62 Minuteman III warhead	U.S.
W68 Poseidon warhead	U.S.
W69 SRAM warhead	U.S.
W70 Lance warhead	U.S.
W76 Trident I warhead	U.S.
W78 Minuteman III warhead	U.S.
W79 8-inch artillery projectile	U.S.
W80 Air- and sea-launched cruise missile warhead	U.S.
W84 Ground-launched cruise missile warhead	U.S.
W85 Pershing II warhead	U.S.
W87 MX warhead	U.S.
Yankee I class SSBN	Soviet Union
Yankee II class SSBN	Soviet Union

THE AUTHORS

Dr. Thomas B. Cochran is a nuclear physicist and Senior Staff Scientist at NRDC. He is director of the Databook project and co-director of the Nuclear Program in NRDC's Washington office. He initiated and co-directs a historic project of NRDC and the Soviet Academy of Sciences to operate seismic monitoring stations near the Soviet Union and US nuclear test sites. He has served as a consultant to numerous U.S. government agencies on energy, nuclear proliferation and nuclear reactor matters, including the Department of Energy and the Nuclear Regulatory Commission.

William M. Arkin is director of the National Security Program at the Institute for Policy Studies in Washington D.C. He is a consultant to the NRDC and co-editor of the Nuclear Weapons Databook series. He is a member of the editorial board of the Bulletin of Atomic Sciences. He is author of numerous works including the Nuclear Arms Race at Sea (1987), Nuclear Battlefields (1985), and SIOP: The Secret U.S. Plan for Nuclear War

Dr. Robert S. Norris is a senior research associate with NRDC and co-author of the Nuclear Weapons Databook. He has been a senior research analyst at the Center for Defense Information and taught at universities in the U.S. and Europe. Besides the Databook volumes, he written extensively about nuclear weapons and is a regular contributor to the Bulletin of Atomic Scientists.

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