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NUCLEAR PLANNING GROUP (STAFF GROUP)

PUBLISHED MATERIAL RELATED TO NUCLEAR DEFENCE

Note by the Chairman

Attached are some extracts from recently published material pertaining, inter alia, to nuclear missile armaments that may be of interest to Staff Group members:

ANNEX A: US Military Posture for FY 1974
by Admiral T.H. Moorer, USN

ANNEX B: The Military Balance, 1973-74

ANNEX C: Missile Survey, 1973

2. The extracts in Annex A are based on testimony before the U.S. Congress. The extracts in Annexes B and C do not purport to reflect official positions. It should also be understood that distribution of this material under cover of a Staff Group NOTICE does not imply that the International Staff vouches for the completeness and accuracy of the information contained therein.

(Signed) H.B. SEIM.

NATO,
1110 Brussels.

This document consists of: cover : 1 page
ANNEX A: 7 pages
ANNEX B: 7 pages
ANNEX C: 4 pages

N A T O U N C L A S S I F I E D

ANNEX A to
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EXTRACTS FROM US MILITARY POSTURE FOR FY 1974

by Admiral T.H. Moorer, USN

This is an abbreviated version of Admiral Moorer's statement before the Senate Armed Services Committee on March 28, 1973. Editorial notes are in square brackets.

The statement is of particular interest as a description of US military capabilities, and also throws considerable light on US intelligence estimates of Soviet and Chinese military strength and new equipment at the beginning of 1973.

In view of the domestically increasing economic and political pressures affecting the US military relationship with Western Europe, we have cut out the section of Admiral Moorer's statement dealing with the general NATO-Warsaw Pact balance on the continent. We have replaced it with the relevant extract from the US Secretary of Defense's carefully-worded statement to the House Committee on Appropriations on April 3, which seems to us to be of greater significance. – Ed.

As President Nixon noted in his 1972 Foreign Policy Report, "Of the many elements that constitute military power in the nuclear age, strategic nuclear forces are most crucial." The US strategic forces not only provide the basic deterrent to nuclear attacks on the United States and its allies, but also strengthen the deterrent to major conventional attacks on our allies and on our forces abroad. They are a fundamental prerequisite for the deterrence of all lesser types of war involving conflicting interests between the United States and its two principal adversaries, the Soviet Union and the Peoples Republic of China. Accordingly, the sufficiency of our strategic forces must continue to be our foremost concern.

The ABM Treaty and the Interim Agreement on Strategic Offensive Arms clearly constitute a major step in our efforts to slow the momentum of the USSR strategic forces build-up and to establish some sort of mutual control over the further deployment of such forces by both the US and the USSR. It should be understood, however, that these agreements in themselves do not eliminate the serious strategic problems which have been of such great concern to us during the last few years. The ABM Treaty limits both parties to a relatively small, but equal, number of ABM launchers, and, to some extent, constrains the development of new ABM systems. The Interim Agreement, in contrast, limits both parties to a relatively large, but unequal, number of strategic offensive ballistic missile launchers, and, with but one important exception (i. e., the size of ICBM silos), places no significant constraints on the qualitative characteristics of the missiles or the launchers. Moreover, it places no limitation at all on other types of strategic offensive weapons (e.g., long-range bombers and cruise missiles). Shown [in the table below] are the strategic offensive missile systems associated with the Interim Agreement. You will recall that this Agreement deals not only with the forces already deployed, but also with the launchers still under construction or fitting-out.

In summary, the ICBM ceiling is 1,054 for the United States and 1,618 for the Soviet Union; the baseline SLBM ceiling is 656 for the United States and 740 for the Soviet Union; the maximum SLBM ceiling is 710 for the United States and 950 for the Soviet Union; and the total strategic missile launcher ceiling is 1,710 for the United States and 2,359 for the USSR.

US and USSR ICBM Forces

The USSR ICBMs are generally larger than ours. Except for the SS-9 Mod 1s and 2s, which carry a single large warhead, none of them has the combination of yield and accuracy needed to attack hard targets effectively; and there are not enough SS-9 Mod 1s and 2s deployed to constitute a significant threat to our *Minuteman* force. The Mod 3, which is the FOBs or depressed trajectory version, has a relatively large CEP (circular error probability) and is considered a soft-target weapon.

With regard to the SS-9 Mod 4, which has three warheads, another flight test occurred in January of this year, the first since November 1970. It is still too early to assess the significance of that test. As I noted last year, the Mod 4 failed to demonstrate a MIRV capability in the previous tests, but it could deploy a MRV.

I also noted last year that a new version of the SS-11 was being flight tested. These tests have continued on a very active basis during 1972, including two flights into the Pacific Ocean in November of that year. This new version of the SS-11 has

a MRV payload and is probably more accurate that the original version. Even so it does not yet have the combination of yield and accuracy needed to attack hard targets effectively. We believe that it was designed primarily to enhance the penetration capabilities of the SS-11 system against ABM-defended urban/industrial and soft military targets. In view of the large number of flight tests, we estimate that the new version of the SS-11 *is now ready* for deployment. [For a more recent, and revised, estimate see p. 283 of our last *issue – Ed.*]

Flight testing of an improved version of the SS-13 also continued in 1972, but on a very modest scale. We believe this new version of the SS-13 will be somewhat more accurate than the original version but with its relatively small warhead, it is still strictly a soft-target weapon. We believe that this missile may also be ready for deployment.

In contrast to the United States, which does not have any new ICBM systems under development at this time, the Soviet Union is actively testing three new or significantly improved ICBMs—an "SS-9 follow-on", an "SS-11 follow-on", and an "SS-13 follow-on". *It is still too early to* draw any firm conclusions as to the ultimate goals of the three new Soviet ICBM development programs. We have reason to believe, however, that these goals include increased pre-launch survivability, accuracy, and improved re-entry systems.

We have no conclusive evidence as yet that the Soviet Union has an operational MIRV. Nevertheless, we continue to believe that such payloads will be developed and deployed. The Soviet Union undoubtedly regards the achievement of a MIRV capability as an important political, as well as a military, goal. The deployment of some 300 "heavy" MIRVed "SS-9 follow-on" ICBMs, *which is permissible under* the Interim Agreement, would greatly enhance the USSR's hard-target capabilities, *particularly if the new missile turned out to* be significantly more accurate than the SS-9.

While the United States does not have any new ICBM systems under development at the present time, further improvements are being made in the *Minuteman II* and *III* systems. These include:

1. Upgrading the "hardness" of the *Minuteman II* and *III* silos.
2. Installing, on a phased basis, a Command Data Buffer system in all *Minuteman III*

US and USSR Strategic Offensive Missile Launchers Associated with Interim SAL Agreement*

United States		Soviet Union	
Titan II	54	SS-7/8	209
Minuteman I	260	SS-9 (incl. new silos)	313
Minuteman II	510	SS-11/13 (incl. new	
Minuteman III	230	silos)	1,096
Total ICBMs	1,054	Total ICBMs	1,618 (1,409)
Polaris A-2	128	SLBMs on modern	
Polaris A-3	208	SSBNs	710
Poseidon	320	SLBMs on older SSBNs	30
Total SLBMs	656	Total SLBMs	740
SAL SLBM ceiling	(710)	SAL SLBM	(950)
Total (launcher ceiling)	1,710 (1,710)	Total (launcher ceiling)	2,358 (2,359)

* Operational and under construction or conversion.

squadrons to increase the flexibility of the force [by providing rapid retargeting from the launch control centres].

We estimate that the USSR at mid-1972 had a total of 1,527 operational ICBM launchers. By mid-1973, some 60 new small silos could be completed, raising the total to about 1,590 operational ICBM launchers. With the completion of [31] new large silos, the Soviet ICBM force would be brought up to our estimate of the Interim Agreement ceiling.

If the USSR does not exercise its option to replace the SS-7s and -8s with modern SLBMs, we would assume that the ICBM force would be maintained at or near the maximum level permitted by the Interim Agreement. *It also seems reasonable to* assume that one or more of the new "follow-on" ICBMs would be deployed in the next few years, and that at least the "SS-9 follow-on" would be MIRVed.

Much more likely, the USSR will choose to exercise its option and replace the older ICBMs with modern SLBMs. Inasmuch as the number of SLBM launchers on nuclear-powered submarines operational or undergoing sea trials is expected to reach the initial ceiling of 740 launchers by the mid-1970s, we assume the phase out of the SS-7s and -8s will begin at least by that time. In this case, the remaining ICBM force might be modernized more intensively by the deployment of all three "follow-on" ICBMs, perhaps with MIRV payloads.

The US ICBM force will be maintained at about its present level over the next several years. The number of *Minuteman IIIs*, however, will increase to 550 by mid-1975. By that time, all of the *Minuteman Is* will have been phased out of the force.

US and USSR SLBM Forces

Our estimate of Soviet SLBM launchers on modern ballistic missile submarines operational and under construction in mid-1972 is subject to some uncertainty. We estimate that about 29 *Yankee* class submarines (with 16 SS-N-6 launchers each) and one *Delta* class submarine (a modification of the *Yankee*-class with 12 SS-N-8 launchers each) had been launched by that time. We believe a mix of 12 more *Yankees* and *Deltas* were under construction in the assembly buildings at that time, making a total of 42 submarines "operational and under construction". The USSR maintained, however, that major sub-assembled sections of these submarines were being fabricated elsewhere, and that a total of 48 submarines were "operational or under construction" at that time [thus qualifying for inclusion under the overall launcher ceiling imposed by the Interim SAL Agreement].

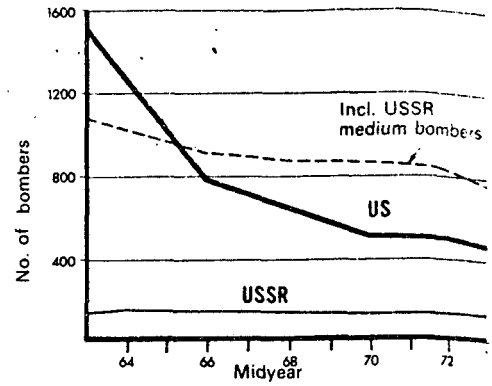
With regard to the SS-N-8 we estimate that its range is about 4,000 nm, considerably greater than the SS-N-6. Inasmuch as the SS-N-8 has been intensively flight tested in the last year, including three flights into the Pacific, we assume that it is probably ready for deployment.

None of the [operational] USSR SLBMs (i.e. SS-N-4, -5, -6 and -8] has demonstrated an effective hard-target capability, and none carries more than one RV. We estimate, however, that new "follow-on" SLBMs will be developed and that they probably will be MIRVed, particularly if the USSR develops a MIRV technology for its ICBMs.

While none of the [operational] US SLBMs [i.e. *Polaris* A-2, A-3 and *Poseidon*] has a hard-target capability, the *Polaris* A-3 carries MRVs and the *Poseidon* carries MIRVs. The new *Trident* C-4 SLBM will carry a payload comparable to that of *Poseidon,* but will have a considerably greater range—about 4,000 nm [equal to the SS-N-8]. The IOC [Initial Operational Capability] of this new [C-4] missile, however, has been slipped to late-1978, the IOC date of the first *Trident* submarine.

We estimate that the USSR by mid-1973 will have a total of about 560 SLBM launchers, excluding some 60 SS-N-4 and -5 launchers on diesel-powered submarines. These 60 launchers are excluded from all USSR strategic forces projections after mid-1972 because they are not considered "strategic missile forces" in terms of the Interim Agreement. Instead, they are included in "theater nuclear forces" after that date.

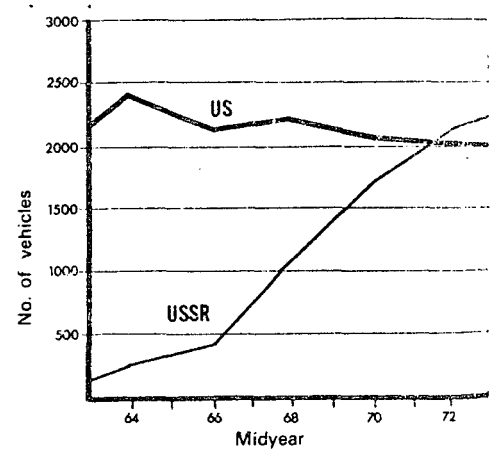
Chart 1: **US and USSR Intercontinental Bombers**



If the USSR chooses to retain the SS-7 and -8 ICBMs, it could reach its "baseline" ceiling of 740 SLBMs by the mid-1970s. Conversely, if the USSR decides to phase out the SS-7s and -8s, it could reach its ceiling of 62 modern ballistic missile submarines and 950 SLBM launchers before expiry of the Interim Agreement.

The United States is already at its initial SLBM ceiling—656 launchers. Since the first *Trident* submarine will not be available until late-1978, a decision on which systems it will replace need not be made for some time. Meanwhile, we will continue to modernize our SLBM forces with *Poseidon*. The last *Polaris* A-2 SLBM will be out of the forces by mid-1975, and by mid-1976, all of the *Poseidon* conversions will have been completed. At that time we will have 31 *Poseidon* submarines (496 launchers) and ten *Polaris* A-3 submarines (160 launchers).

Chart 2: **US and USSR Strategic Offensive Delivery Vehicles** (ICBM launchers SLBM launchers and Intercontinental bombers)



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US and USSR Strategic Bomber Forces

Shown on *Chart 1* are the US and USSR strategic bomber forces projected through mid-1973. The major uncertainty regarding the USSR bomber force is still the primary mission of the new *Backfire* variable-geometry wing, supersonic bomber. Without an appropriate tanker fleet for air-to-air refueling, a *Backfire* force would be considered best suited for peripheral attack. The *Backfire*, however, probably has an air-to-air refueling capability and, in addition to the limited number of *Bison* tankers there are at least two new jet transport aircraft which could be adapted to the tanker role. But regardless of which mission may by primary, the *Backfire* will be an important element of Soviet Long Range Aviation and will probably enter the forces this year or next.

In terms of just *intercontinental* bombers, the United States now has, and will most likely continue to enjoy, a substantial quantitative lead over the Soviet Union, even if the *Backfire* is deployed for this mission and even though the number of US intercontinental bombers will decline as some of the older B-52s are phased out during the next few years. If a decision is made next year to produce and deploy the new B-1 bomber, the first few aircraft could be operational by mid-1978.

US and USSR Strategic Offensive Balance

The total numbers of US and USSR strategic offensive delivery vehicles, projected through mid-1973, are shown on *Chart 2*. It should be noted that, on this chart, the medium bombers are excluded and only the "deployable" ballistic missile submarines are counted (i. e., submarines in conversion or overhaul are excluded because they are not readily available for deployment).

As can be seen on the chart, the USSR has completely eliminated our very substantial lead in delivery vehicles, and now has surpassed us. This USSR quantitative advantage over the US is expected to widen further over the next five years as we continue to phase out some of our older B-52s and they complete the build-up of their SLBM force to the level permitted by the Interim Agreement.

The USSR already far surpasses the US in total strategic offensive megatons, the second measure of the strategic balance. (This measure represents the total estimated yield of all the weapons expected to be loaded in the delivery vehicles included on *Chart 2*.) US megatons declined sharply from 1966 to 1970 as the number of heavy bombers was reduced, and will continue to decline over the next few years as our missile forces are converted to MIRVs. The future trend in USSR megatons will depend importantly on the extent to which the missile forces are converted to MIRVs. But even with a relatively rapid conversion, the USSR is expected to continue to maintain its predominant lead in gross megatons for several years to come.

Only in numbers of strategic offensive warheads is the US likely to maintain its lead over the USSR during the next five years. Even here, the USSR has the potential to overtake us since its missile forces have considerably greater "throw weight" or payload capacity than our missile forces. Thus, if the USSR moves vigorously into MIRVs during the next few years it could, within the bounds of the Interim Agreement, considerably narrow our lead in numbers of warheads.

US and USSR Strategic Defensive Forces

The Treaty on the Limitation of Anti-Ballistic Missile Systems, as indicated by the title, applies only to the ABM forces of the US and the USSR. But, with respect to these forces, the terms of the Treaty are quite precise and the limitations are very tight. Each Party is limited to no more than 200 ABM missiles and 200 ABM launchers—100 of each for the defense of the national capital, and 100 of each for the defense of an ICBM area.

The Soviet Union already has an operational ABM system deployed around its national capital (i. e., the so-called *Galosh* system around Moscow), but to our knowledge, construction of an ABM defense for an ICBM area has not yet been started. The United States, in contrast, has substantially completed the facilities construction phase of an ABM defense for an ICBM area (i. e., the *Safeguard* site at Grand Forks, North Dakota), but, as you know, the Congress has refused to authorize the construction and deployment of an ABM defense for the national capital.

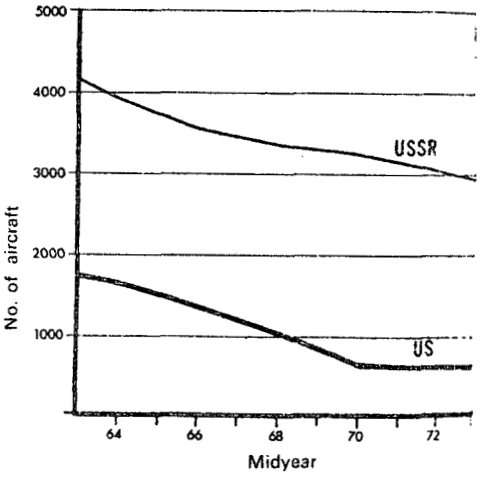
The operational ABM system deployed around Moscow consists of four complexes, each with 16 *Galosh* missile launchers and *Try Add* mechanical scan engagement radars. Target acquisition and tracking is provided by a large, phased-array *Dog House* radar near Moscow. Another radar of this type is now under construction

near Moscow and may soon become partially operational. These two phased-array radar complexes count against the Treaty limitation of six complexes for the defense of the national capital area; the *Try Add* radars in the four existing ABM complexes do not. The deployment of additional early warning radars is not prohibited by the ABM Treaty, provided that the radars are deployed along the periphery of the national territory and are oriented outward.

Last year, I informed the Committee that after a lapse of several years, work had been resumed at some of the previously started but uncompleted ABM complexes around Moscow. This work has progressed markedly during the past year. It seems reasonable to assume that during the next few years the Soviet Union will complete the deployment of the Moscow ABM system up to the Treaty limit—six ABM radar complexes (excluding the existing *Try Adds*) and 100 ABM missiles on launchers.

Although there was some decline in the number of ABM test firings last year as compared with 1971, we have good evidence of a continuing Soviet interest in ABM research and development.

Chart 3: **US and USSR Home Defense Interceptor Aircraft**



With regard to the US ABM program we now plan to complete the Grand Forks site with 100 missiles on launchers, one Missile Site Radar, and one Perimeter Acquisition Radar. This site is expected to be operationally ready before mid-1975. Construction of the Malmstrom site has been terminated. Work at the other two *Safeguard* sites planned for the defense of *Minuteman* has also been terminated.

In view of the position taken by the Congress with respect to an ABM defense for the national capital, it now has been decided to defer the start of this site pending further study. The national capital site is required for the protection of the National Command Authorities (NCA), and not for the Washington, D.C. area, per se.

As a hedge against the emergence of new threats which could gravely jeopardize our national safety, we plan to continue the development of the Site Defense system and new technological approaches to even more advanced ABM systems.

Our current projections of the US and USSR air defense forces are essentially the same as those I presented here last year. The Soviet Union's commanding lead over the United States in numbers of air defense radar sites, command and control facilities, surface-to-air missile launchers, and interceptor aircraft is expected to continue over the next five years. The first two elements of the modernized US air defense system—the Airborne Warning and Control System (AWACS) aircraft and the Over-the-Horizon Backscatter (OTHB) radars—are now scheduled to become operational in the late-1970s. The deployment of the first squadron of Improved Manned Interceptors (IMI) is tentatively planned for the early-1980s [the following modified aircraft are competing for the IMI contract: F-15, F-14, F-111-X-7, NR-349]. Although no decision has been made as yet with respect to the deployment of the SAM-D for continental defense, it could also be available in the early-1980s.

Shown on *Chart 3* are the US and USSR home defense interceptor forces projected through mid-1973. The Soviet force, although declining slowly in numbers, is being steadily modernized. By mid-1973, the four newest interceptors—*Firebar* (Yak-28), *Fiddler* (Tu-128), *Flagon-A* (Su-11), and *Foxbat* (MiG-25)—will account for about 40 per cent of the force, while the three oldest interceptors—*Fresco* (MiG-17), *Farmer* (MiG-19), and *Flashlight* (Yak-25)—will account for only 35 per cent. The *Fishpot* (Su-9), introduced in 1959, accounts for the remaining 25 per cent. This modernization effort is expected to continue, and the three oldest-type interceptors will probably be phased out of the force as the new aircraft are delivered.

Our intelligence organizations still believe that by the late-1970s the USSR may provide its advanced interceptors with a look-down/shootdown radar/missile system, and may deploy a new AWACS with a

look-down capability over land, as well as water [10 AEW Tu-114 *Moss* are deployed in the latter role]. Such an interceptor/AWACS force could pose a formidable threat to our bombers. While we have no firm evidence of the existence of either system, we are hedging against this contingency with development of the Subsonic Cruise Armed Decoy for our bombers.

The US interceptor force will be maintained through mid-1973 at about the current level, with a total active inventory of about 600 aircraft, including the air defense units of the Air National Guard. The last new production interceptors (F-106s) were delivered to the forces in 1961.

With the phase out of *Bomarc*, the number of US SAM launchers has declined to about 500, the level at which it will be maintained at least over the next few years.

The Soviet SAM force increased slightly during the past year as additional SA-3 low-altitude SAMs and SA-5 long-range, high-altitude SAMs were deployed. However, the long term build-up of this force may be nearing completion [at about 10,000 launchers]. While some additional SA-3s and -5s, or possibly more advanced SAMs, may be deployed during the next few years [the triple-mounted SAM-6 mobile low-level system is entering service], this increase may be offset, or even exceeded, by the phase out of older SAMs.

PRC Strategic Offensive Forces

The Peoples Republic of China (PRC), during the past year, continued to make steady progress in the build-up of its nuclear forces. The production of fissionable materials continues to expand as new facilities come on-line, thus permitting a more rapid increase in the stockpile of nuclear weapons.

The PRC has a variety of nuclear delivery systems operational or under development, including both aircraft and missiles. The aircraft will be discussed later in context with the theater nuclear forces. The missile systems will be discussed here because of their strategic implications.

Last year, I informed the Committee that the PRC had developed and tested a MRBM and an IRBM, and that the former, and possibly the latter, could be ready for deployment. We now have reason to believe that both of these systems have been operationally deployed. Moreover, a third system, which I referred to last year as a multi-stage longer range IRBM, may also be nearing operational deployment. This last system might more properly be termed a limited range ICBM; it could reach deep into the Soviet Union, but it could not reach the Continental United States (except for the western part of Alaska).

The PRC, however, is also developing a full range ICBM and this program is moving forward at a slow, but steady, pace. We are still estimating that this missile could reach an IOC as early as 1975, but more likely, a year later. Its range, carrying a 3 MT warhead, could be about 6,000 nm, sufficient to reach virtually all major targets in the Continental United States. Inasmuch as an ICBM cannot be tested at full range within the confines of the PRC, we would expect that eventually this new missile will be tested out into the Pacific or the Indian Ocean. If it is so tested, we will know much more about its characteristics.

In addition to these liquid fuel missiles, we believe the PRC has also been working for some time on the development of solid fuel missiles. While we do not as yet have a good basis for estimating an IOC, a solid fuel MR/IRBM-class missile and/or a solid fuel SLBM would probably not be available for deployment before the mid-1970s. The PRC has one Soviet-type *Golf*-class diesel-powered missile launching submarine which it built during the early 1960s, but to our knowledge, it has never been equipped with missiles. If the PRC is indeed developing a solid fuel SLBM, it is reasonable to assume that this submarine would be used as the test platform. No other PRC ballistic missile submarines are known to us; however, we cannot preclude the possibility that one or more may be under construction [up to 3 nuclear-powered ballistic missile submarines have been reported to be in production, although there is no unclassified confirmation of this].

PRC Strategic Defensive Forces

The PRC air defense system, notwithstanding the relatively large number of interceptors, is quite limited in capability as compared with that of the Soviet Union. By mid-1973, the PRC is expected to have about 3,400 operational home defense interceptors, but except for a small number of Mig-21s, most of these aircraft are of the older types—Mig-15s, -17s, and -19s. The PRC still has only a few hundred SAM [-2] launchers deployed, mostly around a few key cities. The rate of de-

ployment is increasing, however, and this force is expected to grow more rapidly in the future. [The air defense system also includes early warning/control radar.]

The fundamental shift in the overall strategic balance, resulting from the Soviet Union's attainment of relative strategic parity with the United States, has significantly increased the importance of the general purpose forces (including the theater nuclear forces) in the deterrence of conflict below the level of strategic nuclear war.

While this new situation of relative strategic parity logically warrants a greater emphasis on general purpose forces than heretofore, we have had to take into account in the planning of those forces the political, fiscal, and manpower realities which prescribe smaller, but more efficient, US general purpose forces, and require a much greater degree of self-reliance and burden-sharing by our allies in the common defense.

Theater Nuclear Forces

In addition to the strategic nuclear forces discussed earlier, both the US and the USSR have large theater nuclear forces. In this regard, the PRC is still far behind the US and the USSR, both qualitatively and quantitatively. As noted earlier, however, the PRC nuclear weapons stockpile is expected to increase rapidly over the next few years, as fissionable material production facilities are expanded.

The US theater nuclear-capable land forces include fighters in tactical air units, tactical surface-to-surface missile launchers, artillery, SAMs, and atomic demolition munitions (ADMs) in ground units, but no MR/IRBMs or medium bombers. The Soviet theater nuclear-capable land forces include MR/IRBM launchers, medium bombers in Long Range Aviation, light bombers and fighters in tactical air units, and tactical surface-to-surface missiles (and possibly artillery and ADMs) in ground units.

The US theater nuclear-capable naval forces include carrier-based aircraft, SAM launchers on surface ships, and a wide variety of anti-submarine warfare (ASW) weapons, but no cruise missile launchers. The Soviet theater nuclear-capable naval forces include cruise missile launchers on surface ships and submarines, medium bombers in naval aviation units, and possibly ASW weapons, but no carrier aircraft.

The PRC theater nuclear-capable forces include MRBM and IRBM launchers, medium and light bombers, and possibly some fighters. We do not believe the PRC has nuclear-capable weapons for its naval forces at this time.

It is difficult to draw precise conclusions as to the relative balance between the US and the USSR in theater nuclear weapons. Nevertheless, I continue to believe that the US is at least the equal of the USSR in overall capability, and probably still the superior in nuclear weapon technology. The PRC, while still far behind the US and the USSR, is now a significant nuclear power in its region.

Source: International Defense Review (August, 1973). Vol. 6, No. 4, pp. 447-451

ANNEX B to
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EXTRACTS FROM
THE MILITARY BALANCE, 1973-74

The United States and the Soviet Union

The year after the May 1972 Soviet-American Interim Agreement on the limitation of offensive missiles provided little evidence of super-power restraint in that field. Both governments seemed determined to reach the limits set by their Agreement as soon as possible, while also obtaining the maximum qualitative capability.

The United States has deployed 350 *Minuteman 3* ICBM, each with three MIRV, and is now moving towards completing that programme, involving 550 *Minuteman 3* with up to 1,650 warheads by 1975. Meanwhile, all the 1,000 *Minuteman* silos are being substantially strengthened ('hardened') against nuclear attack and a new Command Data Buffer system is being installed to provide rapid ICBM retargeting. At sea, about 320 *Poseidon* SLBM, each with 10-14 MIRV, have been deployed in some 20 submarines. Conversion of another 11 submarines to *Poseidon* is in train and will be complete by 1975–76, at which time only 10 submarines with *Polaris A3* SLBM will remain in service. Thereafter, the *Trident 1* SLBM, with a 4,600-mile range, could become operational in late 1978, either in *Poseidon* submarines or in the new *Trident* boats, probably with 24 missile tubes each, which are being developed to enter service, apparently in the Pacific, in the same year. By using the freedom allowed by the Interim Agreement to replace *Titan 2* ICBM with *Trident* SLBM, the United States could thus have 1,000 ICBM and 710 SLBM, carrying well over 8,000 warheads, by the end of the 1970s.

The Soviet Union has also shown every sign of reaching the Interim Agreement's limits. On land, where 1,527 Soviet ICBM are already deployed, development has continued of three new ICBM types: the SS-16 (an improved version of the solid-fuel SS-13), the SS-17 (an improved SS-11) and the SS-18 (an improved SS-9). The last two have both been tested with re-entry systems of three MRV, and are reportedly being prepared to carry full MIRV systems at a later stage. The SS-18, tests of which began in 1968, is an obvious candidate for installation in the 25 large silos started in 1970 but still incomplete, thus bringing the Soviet total of 'heavy' ICBM to the 313 permitted by the Interim Agreement. The SS-17, which has been fired over a range of some 4,500 miles, may equip the remaining 66 incomplete silos, raising the overall ICBM total to the permitted ceiling of 1,618. At sea, the ceilings of 62 'modern' ballistic-missile submarines and 950 'modern' SLBM are further away. Some 31 Y-class submarines, each with 16 SS-N-6 SLBM (1,500–1,750 mile range), have been launched, as have about 3 of the new D-class boats, each with 12 SS-N-8 SLBM (4,600 mile range). Only these count against the submarine ceiling, although another 30 SLBM in older nuclear-powered submarines bring the current number of missiles relevant to the SLBM ceiling to about 560. Even if the Soviet Union decides to exercise her option to replace SS-7 and SS-8 ICBM with new SLBM, it thus seems likely, at expected building rates, to be at least 1977 before she could reach the two ceilings now established. No Soviet SLBM has as yet been tested with MRV.

Soviet and American determination to build ABM systems up to the limits in the ABM Treaty of May 1972 is less certain. The United States is completing her one permitted *Safeguard* site for defence of ICBM silos at Grand Forks, to be operational in late 1974, and has also continued research on what is now known as the *Site Defense* (formerly *Hard Site*) ABM system for the more economical defence of ICBM silos with short-range missiles alone, but she has not yet taken any substantial step towards deploying ABM launchers around Washington. The Soviet Union has continued to develop a more effective ABM missile to replace the *Galosh* in the defence of the Moscow area, and has also showed signs of expanding that defence from 64 to 100 launchers, but there is no clear evidence that she has yet decided to construct the second permitted site for ICBM defence.

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In one of the areas still unconstrained by SALT, strategic bomber aircraft, the emphasis has been largely on development rather than deployment. The American force is actually to be reduced during 1973–74, from 30 squadrons to 28 (24 of B-52s and 4 of FB-111s), while the Soviet force is expected to remain at little more than a quarter of that strength. The United States, however, is pressing ahead with the B-1 programme, which should bring that new supersonic bomber into service from 1978, while the Soviet Union has been actively testing her *Backfire* prototypes which, although not fully 'inter-continental', have a range comparable to that of the FB-111. The United States is also greatly increasing the striking power of her existing bombers by equipping them with the Short-Range Attack Missile (SRAM), a nuclear air-to-ground missile with a range of 35–100 miles. SRAM entered operational service in August 1972 and should be fully deployed, with 1,500 missiles in 21 bomber squadrons, by 1974–75. Meanwhile, air defence forces on both sides are also subjects for qualitative improvement. The American F-14 and F-15 fighters are moving towards full operational deployment, possibly to be followed in the early 1980s by a new Improved Manned Interceptor (IMI), while the Soviet Union is already introducing new types, including the MiG-25 *Foxbat* and the variable geometry MiG-23 *Flogger* into her fighter forces. Both countries are also seeking to improve static and mobile radar coverage, with equipment such as the American Over-The-Horizon Backscatter (OTH-B) radar and Airborne Warning and Control System (AWACS) aircraft.

Qualitative improvement is, in fact, the keynote in all non-strategic forces. The United States, in particular, having ended her combat role in Vietnam in 1972, is moving towards all-volunteer armed forces by mid-1975 (when the last conscript will be released) amid doubts about her ability thereafter to maintain more than about 1.8 million men under arms: a prospect which demands qualitative excellence, something which the Soviet Union will, for its own reasons, clearly wish to match. In addition to new aircraft, development programmes for new armoured equipment, tactical missiles and naval vessels all show signs of acceleration. The Soviet Union has launched her first conventional aircraft carrier of 40,000 tons and is actively deploying new *Kara*-class cruisers, *Krivak*-class GM destroyers and C-class cruise-missile and V-class attack submarines. The United States has committed funds to her fourth nuclear-powered aircraft carrier, to 37 new DD-963 destroyers and to the first 28 688-class nuclear-powered hunter/killer submarines. Both are developing a range of new battlefield equipment, including new battle tanks: the Soviet M-1970 and the American XM-1. Further ahead, more exotic technical possibilities appear. Just as precision-guided munitions, such as 'smart' bombs and remotely piloted vehicles (RPV), may change the calculus of tactical air/land warfare in the later 1970s, so, in the 1980s, laser weapons may begin to influence aerial combat. In the first year of strategic arms limitation, it was thus also possible to identify many of the elements which could figure in a continued strategic and tactical arms race if political constraints should prove inadequate.

Source: The Military Balance, 1973-1974. London: International Institute for Strategic Studies, 1973.

1. NUCLEAR DELIVERY VEHICLES: COMPARATIVE STRENGTHS AND CHARACTERISTICS

(A) UNITED STATES AND SOVIET UNION

(i) *Missiles and Artillery*

		United States					Soviet Union				
	Category[a]	Type	Max. range[b] (statute miles)	Estimated warhead yield[c]	First deployed	Number deployed (July 1973)	Type[d]	Max. range[b] (statute miles)	Estimated warhead yield[e]	First deployed	Number deployed (July 1973)
Land-based missiles	ICBM	LGM-25C *Titan 2* LGM-30B *Minuteman 1* LGM-30F *Minuteman 2* LGM-30G *Minuteman 3*	7,250 7,500 8,000 8,000	5–10 MT 1 MT 1–2 MT 3 × 200 KT	1962 1962 1966 1970	54 140 510 350	SS-7 *Saddler* SS-8 *Sasin* SS-9 *Scarp* SS-11[g] SS-13 *Savage*[g]	6,900 6,900 7,500 6,500 5,000	5 MT 5 MT 20–25 MT[h] 1–2 MT[h] 1 MT	1961 1963 1965 1966 1968	209 288[f] 970[f] 60
	IRBM						SS-5 *Skean*[j]	2,300	1 MT	1961	100
	MRBM						SS-4 *Sandal*[k]	1,200	1 MT	1959	500
	SRBM	MGM-29A *Sergeant*[l,m] MGM-31A *Pershing*	85 450	KT range KT range	1962 1962	(500) (250)	SS-1b *Scud A*[l] SS-1c *Scud B*[l] SS-12 *Scaleboard*	50 185 500	KT range KT range MT range	1957 1965 1969	(300)
	Long-range cruise missiles						SS-N-3 *Shaddock*	450	KT range	1962	(100)
	Unguided rockets	MGR-1B *Honest John*[l,m]	25	KT range	1953	n.a.	*FROG* 1-7[l]	10–45	KT range	1957–65	(600)
Sea-based missiles	SLBM (nuclear subs)	UGM-27B *Polaris A2* UGM-27C *Polaris A3*[n] UGM-73A *Poseidon*	1,750 2,880 2,880	800 KT 1 MT or 3 × 200 KT 10 × 50 KT	1962 1964 1971	336 320	SS-N-5 *Serb* SS-N-6 SS-N-8	750 1,750 4,000	MT range MT range MT range	1964 1969 1972	30 496 36
	SLBM (diesel subs)						SS-N-4 *Sark* SS-N-5 *Serb*	350 750	MT range MT range	1961 1964	36 30
	Long-range cruise missiles (subs)						SS-N-3 *Shaddock*	450	KT range	1962	338
	Long-range cruise missiles (surface vessels)						SS-N-3 *Shaddock*	450	KT range	1962	48

Category		United States					Soviet Union				
		Type	Max. range[b] (statute miles)	Estimated warhead yield[c]	First deployed	Number deployed (July 1973)	Type[d]	Max. range[b] (statute miles)	Estimated warhead yield[c]	First deployed	Number deployed (July 1973)
Artillery	Self-propelled	M-110 203mm (8in) how[t]	10	KT range	1962	102					
		M-109 155mm how[t]	10	2 KT	1964	306					
	Towed	M-115 203mm (8in) how[t]	10	KT range	1950s	n.a.	M-55 203mm gun/how[t]	18	KT range	1950s	n.a.

n.a. = not available.

(ii) *Aircraft*[o]

Category[p]	United States						Soviet Union					
	Type	Max. range[q] (statute miles)	Max. speed (Mach no.)[r]	Max. weapons load (lb)	First deployed	Number deployed (July 1973)	Type[o]	Max. range[q] (statute miles)	Max. speed (Mach no.)[r]	Max. weapons load (lb)	First deployed	Number deployed (July 1973)
Long-range bombers	B-52 D-F	11,500	0.95	60,000	1956	442[t]	Tu-95 *Bear*	7,800	0.78	40,000	1956	100
	B-52 G/H	12,500	0.95	75,000	1959		Mya-4 *Bison*	6,050	0.87	20,000	1956	40[u]
Medium-range bombers	FB-111A	3,800	2.5	37,500	1969	74[t]	Tu-16 *Badger*	4,000	0.8	20,000	1955	800[v]
Strike aircraft (incl short-range bombers): land-based	F-105D	2,100	2.25	16,500	1960	(1,300)[w]	Il-28 *Beagle*	2,500	0.81	4,850	1950	(1300)[w]
	F-4	2,300	2.4	16,000	1962		Su-7 *Fitter*	900	1.7	4,500	1959	
	F-111 A/E	3,800	2.2/2.5	25,000	1967		Tu-22 *Blinder*	1,400	1.5	12,000	1962	
	A-7D	3,400	0.9	15,000	1968		Yak-28 *Brewer*	1,750	1.1	4,400	1962	
							MiG-21MF *Fishbed J*	1,150	2.2	2,000	1970	
							MiG-23 *Flogger*	1,800	2.5	n.a.	1971	
Strike aircraft: carrier-based	A-4	2,055	0.9	10,000	1956	(1,300)[w]						
	A-6A	3,225	0.9	18,000	1963							
	A-7A/B/E	3,400	0.9	15,000	1966							
	F-4	1,997	2·4	1,600	1962							

(iii) *Historical Changes of Strength, 1963–73 (mid-years)*

		1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973
USA	ICBM	424	834	854	904	1,054	1,054	1,054	1,054	1,054	1,054	1,054
	SLBM	224	416	496	592	656	656	656	656	656	656	656
	Long-range bombers[p]	630	630	630	630	600	545	560	550	505	455	442
USSR	ICBM	100	200	270	300	460	800	1,050	1,300	1,510[t]	1,527[t]	1,527[t]
	SLBM	100	120	120	125	130	130	160	280	440	560	628
	Long-range bombers[p]	190	190	190	200	210	150	150	150	140	140	140

NOTES

[a] ICBM = inter-continental ballistic missile (range 4,000 + miles); IRBM = intermediate-range ballistic missile (range 1,500–4,000 miles); MRBM = medium-range ballistic missile (range 500–1,500 miles); SRBM = short-range ballistic missile (range under 500 miles); SLBM = submarine-launched ballistic missile. Long-range cruise missile = range over 250 miles.

[b] Operation range depends upon the payload carried; use of maximum payload may reduce missile range by up to 25 per cent.

[c] MT = megaton = million tons of TNT equivalent (MT range = 1 MT or over); KT = kiloton = thousand tons of TNT equivalent (KT range = less than 1 MT); figures given are estimated maxima.

[d] Numerical designations of Soviet missiles (e.g. SS-7) are of US origin; names (e.g., *Saddler*) are of NATO origin.

[e] SS-9 missiles have also been tested with (i) three warheads of 4–5 MT each, (ii) a modified payload for use as a depressed trajectory ICBM (DICBM) or fractional orbit bombardment system (FOBS).

[f] There are also 25 large silos under construction, possibly to receive SS-18 missiles, an improved version of the SS-9, fitted with MRV.

[g] There are also 66 smaller silos under construction, which are expected to receive SS-16 missiles, an improved version of the SS-13; or SS-17 missiles, an improved version of the SS-11, with MRV.

[h] SS-11 missiles have also been tested with three smaller warheads.

[i] Including those deployed within IRBM/MRBM fields.

[j] A mobile IRBM (SS-XZ *Scrooge*) has been displayed and tested but is not known to be deployed operationally.

[k] A mobile missile (SS-14 *Scapegoat*), apparently with MRBM range, has been displayed and tested but is not known to be deployed operationally.

[l] Dual capable (i.e., capable of delivering conventional explosives or nuclear warheads).

[m] To be replaced by *Lance*, an SRBM with a maximum range of 70 miles and a warhead in the KT range.

[n] Most *Polaris A3* missiles have been modified to carry three warheads.

[o] All aircraft listed are dual-capable and many, especially in the categories of strike aircraft, would be more likely to carry conventional than nuclear weapons.

[p] Long-range bomber = maximum range over 6,000 miles; medium-range bomber = maximum range 3,500–6,000 miles, primarily designed for bombing missions.

[q] Theoretical maximum range, with internal fuel only, at optimum altitude and speed. Ranges for strike aircraft assume no weapons load. Especially in the case of strike aircraft, therefore, range falls sharply for flights at lower altitude, at higher speed or with full weapons load (e.g., the combat *radius* of A-7 at operational height and speed, with typical weapons load, is approximately 620 miles).

[r] Mach 1 (M = 1.0 = speed of sound).

[s] Names of Soviet aircraft (e.g., *Bear*) are of NATO origin.

[t] Including approximately 8 FB-111A and 45 B-52 aircraft in active storage.

[u] Excluding approximately 50 Mya-4 aircraft configured as tankers.

[v] Including approximately 300 Tu-16 aircraft in the Naval Air Force, configured for attacks on shipping, which could, in theory, deliver nuclear weapons.

[w] These aircraft are nuclear-capable but may not necessarily have a nuclear role.

NATO UNCLASSIFIED

- B-5 -

NATO UNCLASSIFIED

- B-6 -

(B) OTHER NATO AND WARSAW PACT COUNTRIES

(i) *Missiles and Artillery*

	Category[a]	NATO (excluding USA) Type[b]	Operated by[c]	Max. range[d] (statute miles)	Estimated warhead yield[e]	First deployed	Number deployed (July 1973)	Warsaw Pact (excluding USSR) Type[f]	Operated by[c]	Max. range[d] (statute miles)	Estimated warhead yield[e]	First deployed	Number deployed (July 1973)
Land-based missiles	IRBM	SSBS S-2	FR	1,875	150 KT	1971	18						
	SRBM	MGM-29A *Sergeant*[g]	GE	85	KT range	1962	19	SS-1b *Scud A*[h]	BU CZ	50	KT range	1957	n.a.
		MGM-31A *Pershing*[g]	GE	450	KT range	1962	72	SS-1c *Scud B*[h]	EG PO	185	KT range	1965	n.a.
	Unguided rockets	MGR-1B *Honest John*	[i]	25	KT range	1953	(150)	*FROG* 1-7[h]	All	10–45	KT range	1957–65	n.a.
SLBM	SLBM	UGM-27C *Polaris A3*	BR	2,880	3 × 200 KT	1967	64						
		MSBS M-1	FR	1,380	500 KT	1972	32						
Artillery	Self-propelled	M-110 203mm (8in) how	[j]	10	KT range	1962	n.a.						
		M-109 155mm how	[k]	10	2 KT	1964	n.a.						
	Towed	M-115 203mm (8in) how	[j]	10	KT range	1950s	n.a.						

NOTES

[a] IRBM = intermediate-range ballistic missile (range 1,500–4,000 miles); SRBM = short-range ballistic missile (range under 500 miles); SLBM = submarine-launched ballistic missile.

[b] All NATO vehicles are of American origin, with the exception of the SSBS IRBM and the MSBS SLBM, which are of French origin.

[c] BR = Britain, FR = France, GE = West Germany, BU = Bulgaria, CZ = Czechoslovakia, EG = East Germany, PO = Poland.

[d] Operational range depends upon the payload carried; use of maximum payload may reduce missile range by up to 25 per cent.

[a] KT = kiloton = thousand tons of TNT equivalent (KT range = less than 1 MT;) figures given are estimated maxima.
[f] All Warsaw Pact vehicles are of Soviet origin. Numerical designations (e.g., SS-1b) are of American origin; names (e.g., *Scud A*) are of NATO origin.
[g] These SRBM are operated by West Germany but the nuclear warheads for them are in American custody. *Sergeant* is dual-capable (i.e., capable of delivering conventional or nuclear weapons).
[h] These dual-capable systems are operated by the countries shown but nuclear warheads for them are in Soviet custody.
[i] *Honest John* is dual-capable and is operated by Belgium, Britain, Denmark, West Germany, Greece, Italy, the Netherlands and Turkey, but with the nuclear warheads held in American custody. In the case of Denmark, there are no nuclear warheads held on Danish soil. France also operates *Honest John* but the nuclear warheads for it were withdrawn in 1966 and its nuclear role is to be taken over by the French SRBM *Pluton*, which will have a French nuclear warhead.
[j] The 203mm how is dual-capable and is operated by Belgium, Britain, Denmark, West Germany, the Netherlands, Italy and Turkey but any nuclear warheads for it are in American custody.
[k] The 155mm how is primarily a conventional artillery weapon but is dual-capable. It is operated by Belgium, Britain, Canada, Denmark, West Germany, Greece, Italy, the Netherlands, Norway and Turkey but in very few cases is it likely to have a nuclear role, certainly not in the case of Canada. Any nuclear warheads would be in American custody, none on Danish or Norwegian soil.

(ii) *Aircraft*[a]

	NATO (excluding USA)							Warsaw Pact (excluding USSR)						
Category[b]	Type[c]	Operated by[d]	Max. range[e] (statute miles)	Max. speed (Mach no.)[f]	Max. weapons load (lb)	First deployed	No. deployed (July 1973)	Type[g]	Operated by[d]	Max. range[e] (statute miles)	Max. speed (Mach no.)[f]	Max. weapons load (lb)	First deployed	No. deployed (July 1973)
Medium-range bombers	*Vulcan* B2	BR	4,000	0.95	21,000	1960	56							
Strike aircraft (incl short-range bombers)	F-104	[h]	1,300	2.2	4,000	1958	n.a.[i]	Il-28 *Beagle*[i]	BU, PO, RU	2,500	0.81	4,850	1950	n.a.[i]
	F-4	BR, GE	1,600	2.4	16,000	1962	n.a.[i]	Su-7 *Fitter*[i]	CZ, PO	900	1.7	4,500	1959	n.a.[i]
	Buccaneer S2	BR	2,000	0.95	8,000	1962	n.a.[i]							
	Mirage IVA	FR	2,000	2.2	8,000	1964	58							

NOTES
[a] All aircraft listed are dual-capable and many would be more likely to carry conventional than nuclear weapons.
[b] Medium-range bomber = maximum range 3,500–6,000 miles, primarily designed for bombing missions.
[c] *Vulcan* and *Buccaneer* are of British origin; F-104 and F-4 are of American origin; *Mirage* is of French origin.
[d] BR = Britain, FR = France, GE = West Germany, BU = Bulgaria, CZ = Czechoslovakia, PO = Poland, RU = Rumania.
[e] Theoretical maximum range, with internal fuel only, at optimum altitude and speed. Ranges for strike aircraft assume no weapons load. Especially in the case of strike aircraft, therefore, range falls sharply for flights at lower altitude, at higher speed or with full weapons load (e.g., combat *radius* of F-104, at operational height and speed, with typical weapons load, is approximately 420 miles).
[f] Mach 1 (M = 1.0 = speed of sound).
[g] All Warsaw Pact aircraft are of Soviet origin. Names (e.g., *Beagle*) are of NATO origin.
[h] The dual-capable F-104 is operated by Belgium, Canada, Denmark, West Germany, Greece, Italy, the Netherlands, Norway and Turkey, but the Canadian aircraft no longer have a nuclear role. The warheads of these aircraft are held in American custody.
[i] Nuclear warheads for these dual-capable aircraft are held in Soviet custody.
[j] The absence of figures here reflects the uncertainty as to how many of these nuclear-capable aircraft actually have a nuclear role.

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EXTRACTS FROM MISSILE SURVEY 1973

Although it has long been common practice in Western defence literature to use such terms as 'strategic weapon' to describe certain kinds of armament, these terms have not been very well defined and—since they are not in such general use among the nations of the Warsaw Pact—can easily be misunderstood.

The idea of classifying certain kinds of weapon as 'strategic' appears to have originated in the United States at the time when, being clearly the most powerfully-armed nation in the world, they had developed their strategy of deterrence based on the threat of 'massive retaliation'. The major-nuclear-weapons that formed the cornerstone of this strategy were then referred to as 'strategic' weapons: at first they were the free-fall bombs carried by 'strategic' aircraft; but nowadays they are the intercontinental and submarine-launched ballistic missiles and the stand-off bombs.

In normal US parlance, indeed, a strategic offensive weapon is one which, as normally deployed in 'peacetime' conditions, can be used without appreciable delay to mount a severe attack on an enemy country—particularly the USSR. At one time, medium-range (about 1,200 miles) ballistic missiles were included in this category; such US missiles being deployed in NATO countries within range of the USSR; but all such missiles have now been withdrawn from US service. In recent years it has become customary also in the USA to refer to a class of 'strategic' defensive weapons a class which includes only those weapons which can be used to counter an attack by enemy 'strategic' missiles.

When the USA engages in strategic arms limitation talks (SALT) with the USSR, therefore, the dialogue relates only to the long-range weapons that each can use to threaten the other's territory and the defence systems, such as the US Safeguard: the mobile 500-mile-range guided missiles with nuclear warheads which both sides possess in quantity are not covered by the SALT agreements nor are the Russian mediums-range ballistic missiles which still remain in service. It is not, indeed, the habit of the Russians to distinguish between 'strategic' and 'tactical' weapons (though they do have 'strategic rocket forces') and any idea that the SALT agreements directly modify Russia's capabilities regarding or intentions towards Europe or Asia is wholly illusory.

The accompanying tables list currently available data on 'strategic' weapons, including the Chinese, French and Russian medium-range missiles, but excluding missiles with maximum ranges not much in excess of 500 miles.

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STRATEGIC MISSILES

Country	Name or NATO Code	US Code	Stages	Propellant	Warhead	Range (statute miles)	Status	Deployment
	1. Intercontinental Ballistic Missiles (ICBM)							
China	Not known	—	?	?	MT range	3,500 (limited)	Development	In 1975?
U.S.A.	Minuteman 1	LGM-30B	3	Solid	1 MT	7,500	Obsolescent	250-300
U.S.A.	Minuteman 2	LGM-30F	3	Solid	1-2 MT	8,000	Operational	500
U.S.A.	Minuteman 3	LGM-30G	3	Solid	1-2 MT or 3x200 KT	8,000	Operational	200-250
U.S.A.	Titan 2	LGM-25C	2	Liquid	5-10 MT	7,250	Obsolescent	54
U.S.S.R.	Saddler	SS-7	2	Storable	5 MT	6,000	Obsolescent	about 200
U.S.S.R.	Sasin	SS-8	2	Storable	5 MT	7,000		
U.S.S.R.	Scarp	SS-9	3	Liquid	20-25 MT	7,500 +	Operational	290
U.S.S.R.	Scrag	SS-10	3	Storable	?	'Global'	Believed Experimental	Believed None
U.S.S.R.	—	SS-11	?	Storable	1-2 MT	6,500	Operational	970
U.S.S.R.	Savage	SS-13	3	Solid	1 MT	5,000	Operational	60
	2 Intermediate Range Ballistic Missiles (IRBM)							
China	Not known	—	?	Storable	KT range	2,500	Operational	15-20
France	SSBS S-2	—	2	Solid	150 KT	1,900	Operational	18
France	SSBS S-3	—	2	Solid	1 MT	1,900	Development	None
U.S.S.R.	Skean	SS-5	1	Liquid	1 MT	2,300	Obsolescent	about 100
U.S.S.R.	Scapegoat	SS-14	2	Solid	1 MT	2,500	Operational	Mobile
U.S.S.R.	Scrooge	SS-XZ	?	Solid?	1 MT?	3,000?	Operational	Mobile
	3 Medium Range Ballistic Missiles (MRBM)							
China	Not known	—	1	Liquid	KT range	1,200?	Operational	about 50
U.S.S.R.	Sandal	SS-4	1	Liquid	1 MT	1,200	Obsolescent	about 450

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Country	Name or NATO Code	US Code	Stages	Propellant	Warhead	Range (statute miles)	Status	Deployment
	4 Submarine Launched Ballistic Missiles (SLBM)							
France	MSBS M-1	–	2	Solid	500 KT	1,400	Operational	32
France	MSBS M-2	–	2	Solid	500 KT	2,000?	Development	None
France	MSBS M-3?	–	2	Solid	MT range	2,000?	Development	None
U.K.	Polaris A3	UGM-27C	2	Solid	3x200 KT	2,880	Operational	64
U.S.A.	Polaris A2	UGM-27B	2	Solid	800 KT	1,750	Operational	80
U.S.A.	Polaris A3	UGM-27C	2	Solid	1 MT or 3x200 KT	2,880	Operational	368
U.S.A.	Poseidon	UGM-73A	2	Solid	10 50 KT	2,880	Operational	208
U.S.S.R.	Sark	SS-N-4	2	Solid	MT range	350	Obsolescent	36
U.S.S.R.	Serb	SS-N-5	2	Solid	MT range	750	Operational	60
U.S.S.R.	Sawfly	SS-N-6	2	Solid	MT range	1,750	Operational	464
U.S.S.R.	–	SS-N-8	2	Solid	MT range	2,500	Development	None
	5 Air Launched Nuclear Missiles							
U.S.A.	Hound Dog	AGM-28 A/B	–	Turbojet	?	600	Operational	600
U.S.A.	SRAM	AGM-69A	2	Solid	1-2 MT	100	Production	5-600
U.S.S.R.	Kipper	AS-2	–	Turbojet	?	100	Operational	Bear (Tu-20) bombers
U.S.S.R.	Kangeroo	AS-3	–	Turbojet	?	300	Operational	Badger (Tu-16) bombers
U.S.S.R.	Kitchen	AS-4	1	Rocket or Ramjet	?	300	Operational	Blinder (Tu-22) bombers
	6 Anti-Ballistic Missile Missiles (ABM)							
U.S.A.	Spartan	XLIM-49A	3	Solid	MT range	Possibly 400+	Production	One complex in hand at Grand Forks
U.S.A.	Sprint 1	–	2	Solid	?	25	Production	
U.S.A.	Sprint 2	–	2	Solid	?	25?	Development	None
U.S.S.R.	Galosh	SA-7	2?	Solid	MT range	200+	Operational	64

ANNEX C to
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Mobile rocket systems for use as heavy artillery were among the earliest of post-war missile developments in both the USA and the USSR and have since been developed, with varying success, by several other countries.

Maximum ranges vary from as little as 10 to as much as 500 miles: the longer-range types are all guided (usually employing some form of inertial guidance) but most of the short-range missiles are not.

America and Russia have developed almost the same number of different types of battlefield support missile; but whereas the Russians appear to have kept all theirs in service, either in the USSR or in one of the satellite countries, the USA has retired three of its missiles (Corporal, Little John and Redstone). The UK's one attempt, Blue Water, was cancelled before the programme was completed; Egypt displayed three missiles some years ago, at least two of which were certainly intended for battlefield use.

The accompanying table gives information on battlefield missiles currently or imminently in service.

BATTLEFIELD SUPPORT MISSILES

Country	Name or NATO Code	US Code	Warhead	Guidance	Range (statute miles)	Status
France	Pluton	–	10-15 KT	Inertial	75	Nearing deployment
Israel	Jericho	–	Nuclear?	Inertial	280	Production
Italy	–	–	?	Inertial	25	Study
U.S.A.	Honest John	MGR-1B	KT range	None	25	Large numbers deployed
U.S.A.	Sergeant	MGM-29A	KT range	Inertial	45	About 500 deployed
U.S.A.	Pershing 1A	MGM-31A	High KT range	Inertial	450	About 250 deployed
U.S.A.	Lance	MGM-52A	KT range	Inertial	70	Replacing Honest John and Sergeant
U.S.S.R.	FROG 1-7	SS-1a	KT range	None	10-45	About 600 deployed
U.S.S.R.	Scud A	22-1b	KT range	Command	50	About 300 deployed
U.S.S.R.	Scud B	SS-1c	KT range	Inertial	185	
U.S.S.R.	Scud C or Scaleboard	SS-1d or SS-12	MT range	Inertial	500	

Source : Defence (March, 1973) Vol. 4, No. 3, pp 15 ff