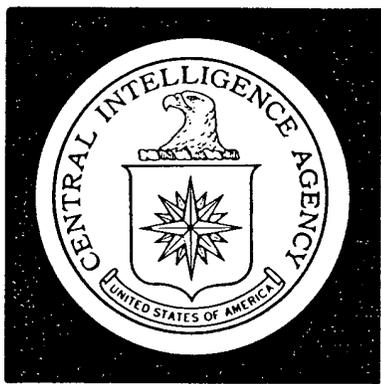
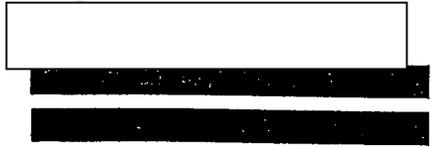


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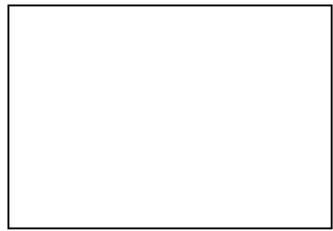
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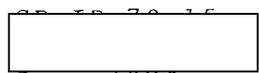
DIRECTORATE OF INTELLIGENCE

# Intelligence Report

*The Changing Shape of the Soviet Peripheral  
Ballistic Missile Force*

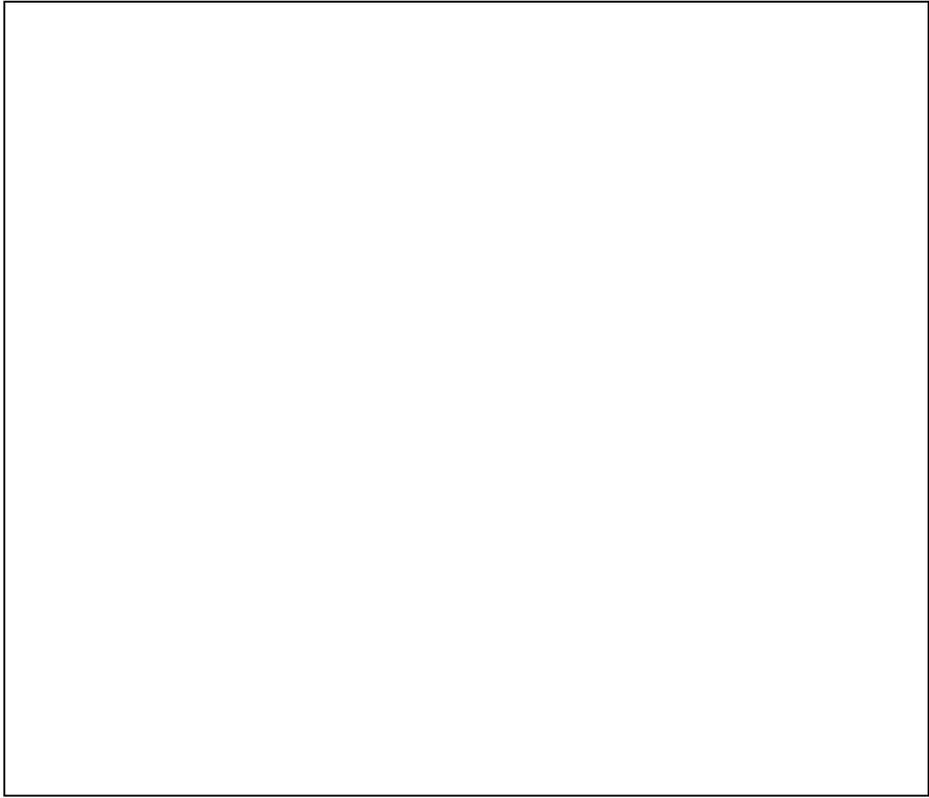


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June 1970

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CENTRAL INTELLIGENCE AGENCY  
Directorate of Intelligence  
June 1970

INTELLIGENCE REPORT

The Changing Shape of the Soviet Peripheral  
Ballistic Missile Force

Introduction

The Soviet peripheral ballistic missile force is directed against targets in areas adjacent to the USSR, filling the gap between the coverage provided by tactical missiles and that of the intercontinental ballistic missile force. The peripheral missile force is a major nuclear delivery component of the Soviet peripheral strategic attack force, which also contains jet medium bombers and diesel powered submarines carrying ballistic missiles.

Initial deployment of the peripheral missile force began in 1958 and was completed in 1965, with a total of some 700 medium range and intermediate range ballistic missile launchers deployed in hard and soft modes.

Change has been characteristic of the force since its formation--deployment programs have been under way in every year except 1966. A major

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*Note: This report was produced solely by CIA. It was prepared by the Office of Strategic Research and coordinated with the Offices of Current Intelligence and National Estimates and the Foreign Missile and Space Analysis Center.*

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transformation in force composition began in the mid-Sixties with the completion of the phaseout of the oldest component, the SS-3, and the addition of two new systems--the Scaleboard short range mobile missile deployed at bases near China in mid-1967 and the SS-11 ICBM being deployed in the western USSR since mid-1968. Some sites for the SS-4 and SS-5 systems have been deactivated recently and these systems may be phasing out of the force. Two other missiles which may form part of the future force are now being developed--the SS-14 Scamp and the PL-1 (now designated the SS-X-15), probably the Scrooge.

This report describes the evolution of the peripheral missile force, its probable mission, and the factors which may have influenced the Soviet decision to maintain a large force. It discusses changes under way and their implications for the future size, composition, and capabilities of the force. A summary begins on page 45.

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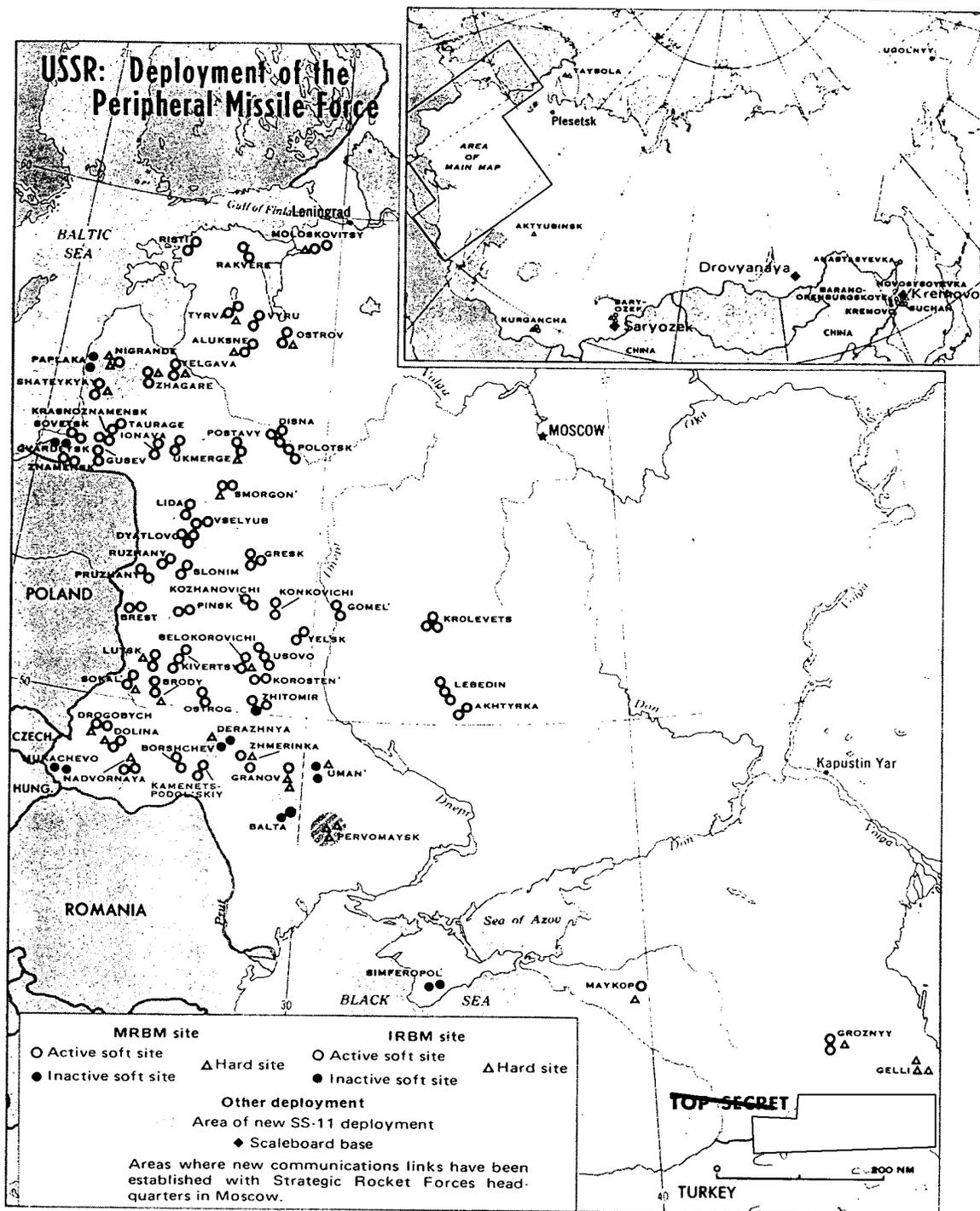
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The initial Soviet peripheral missile force was deployed mostly in the west, with some complexes in the Far East and central portions of the USSR. Since 1966 a major changeover has been under way in the composition of the force--the SS-3 has been phased out and some sites for the SS-4 and SS-5 have been deactivated. The Scaleboard mobile missile has been deployed at three bases near China, and the SS-11 ICBM is being deployed in a peripheral role at two complexes in the western USSR. [redacted] SS-11 deployment may also be under way or planned in the shaded areas.

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Evolution of the Force, 1958-65

The Soviet peripheral strategic missile force came into being in early 1958 with the deployment of the SS-3 MRBM, nicknamed the Shyster, at soft sites. The SS-4 MRBM (Sandal) and SS-5 IRBM (Skean) were subsequently added to the force in both soft sites and hard silos. Deployment of the initial force was completed in 1965, when 700 launchers were operational.

SS-3 MRBM

The Soviets began testing the SS-3 at the Kapustin Yar missile test range in 1954. Development was completed in November 1956 after about [redacted] flight tests, and the SS-3 probably became operational at deployed sites in early 1958. [redacted]

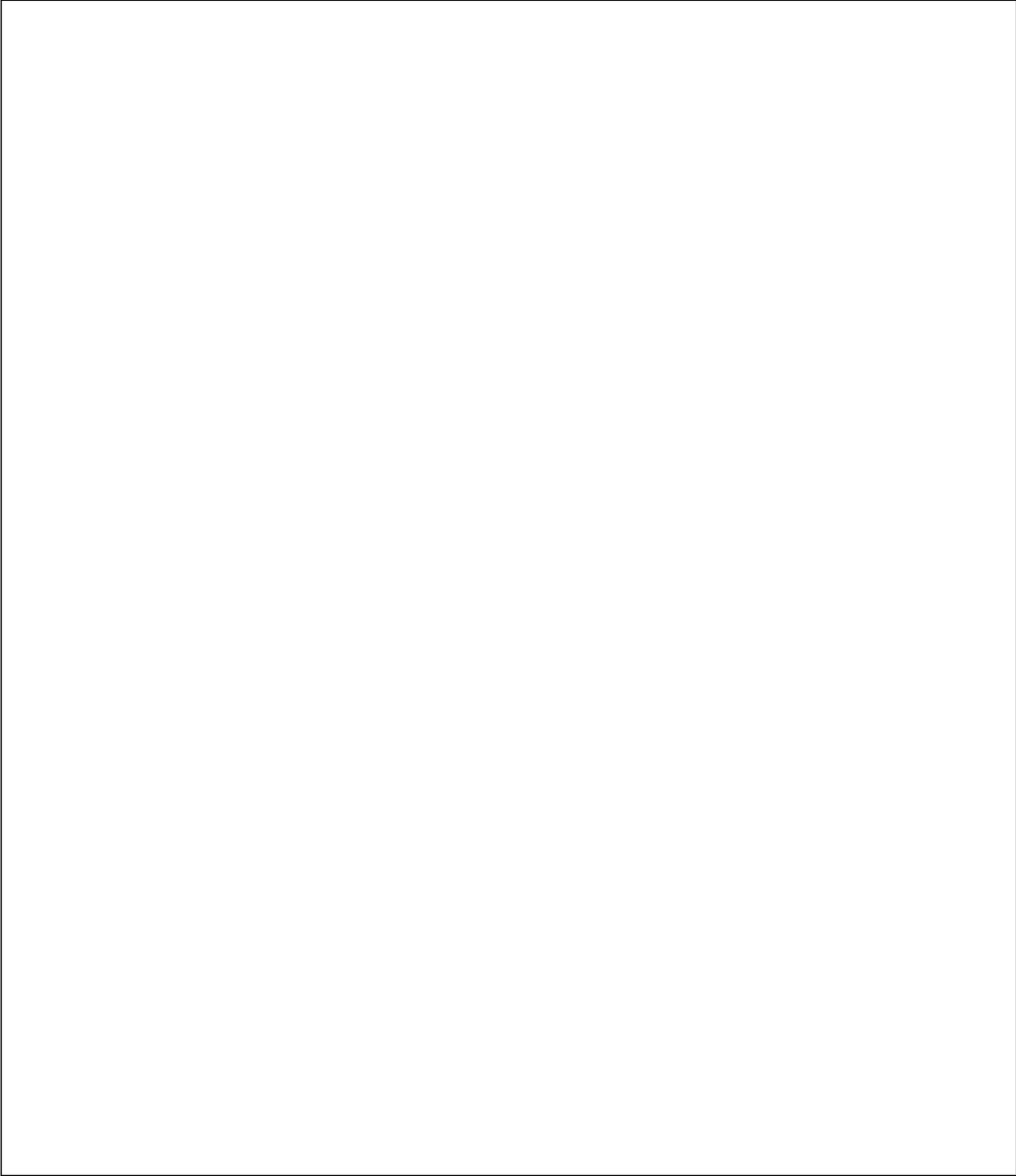
The full extent of SS-3 deployment is [redacted]

[redacted] units from Paplaka and Mukachevo (see map, facing) participated in SS-3 test range firings in 1959 and 1960 and that a unit in the Far East--possibly at Suchan--simulated firing an SS-3 during a command post exercise in 1959. [redacted] SS-3 units were probably deployed at Gvardeysk and Simferopol' and a few additional sites, principally in the military district along the Baltic Sea.

Analysis of the available evidence indicates that the Soviets deployed about 60 SS-3 launchers at 15 soft sites, each with four launch pads (see [redacted] [redacted]). Most sites were near the western

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borders of the USSR and the remainder in the Soviet Far East. Other early MRBM sites which may have been originally intended for SS-3 deployment were equipped instead with the SS-4.

The Soviets probably converted 7 SS-3 sites-- 28 launchers--to the SS-4 system in the early Sixties. The 8 remaining sites--two each at Paplaka, Gvardeysk, Mukachevo, and Simferopol'--continued to be equipped with the SS-3 until at least 1965 and possibly as late as 1967, when they were deactivated.

SS-4 MRBM

Development tests of the SS-4 began at Kapustin Yar in mid-1957 and were successfully completed in December 1958 after 20 firings.

The first sites became operational early in 1959, and the last in 1965. The system was deployed both at soft sites consisting of four launch pads and at hard sites consisting of a cluster of four silos [redacted] Two or three sites, located 2 to 10 nautical miles apart, form a complex. At its peak the SS-4 force totaled 492 soft launchers and 84 silos at 59 complexes.

About 90 percent of the force is deployed in the western USSR in a wide belt extending from the Gulf of Finland to the Black Sea. The remainder is deployed in the Far East, Turkestan, and the North Caucasus (see map on page 6).

[redacted] and [redacted] indicate that SS-4 soft sites have a refire capability. [redacted] has shown that the amount of equipment and the storage facilities at soft sites are sufficient to provide this capability. There are no indications that SS-4 hard sites have a refire capability.

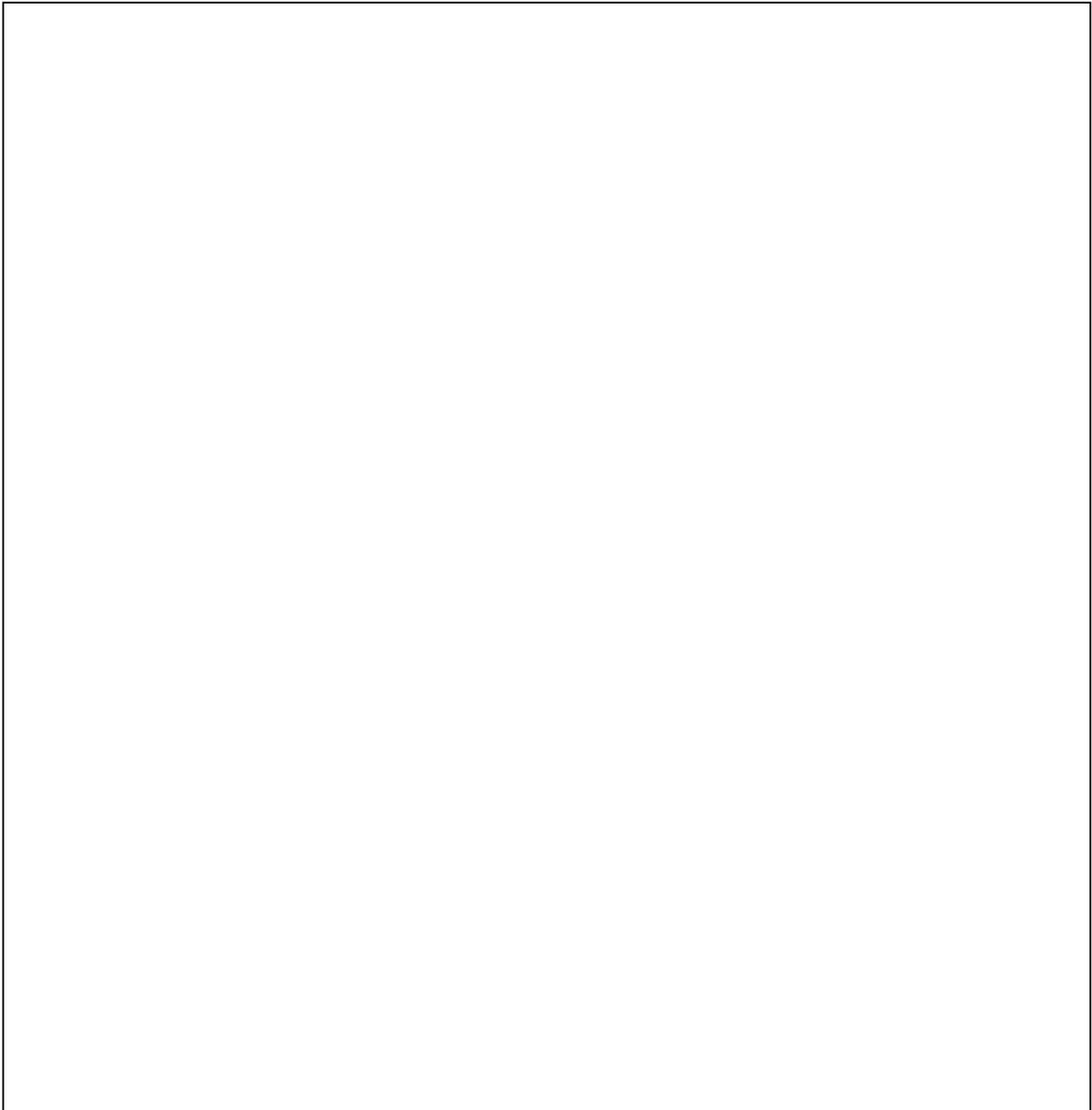
An SS-4 site is manned by a battalion and a complex by a regiment. The regiments exercise operational control over the battalions and provide

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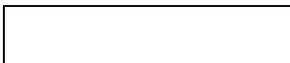


**SS-4 MRBM Sites**

**Soft Site at Ionava**



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[Redacted]

[Redacted]

The SS-4 MRBM is deployed at soft and hard sites, each with four launchers. These sites consist of a launch area, a support area, and [Redacted].  
[Redacted] At its peak, the peripheral force contained 125 soft SS-4 sites with 492 launchers and 21 hard sites with 84 launchers.

In addition to the permanent sites, SS-4 units also make use of field sites consisting of four cleared and graded launch positions without permanent support facilities. [Redacted]  
[Redacted] these sites are utilized by SS-4 units when the permanent sites are inoperable or are in danger of enemy attack.

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[Redacted]

6-70

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logistic and communications support. Three to five regiments make up a division and up to nine divisions form an army. [REDACTED] Orders normally pass down this chain of command, but can be sent from Strategic Rocket Forces headquarters in Moscow directly to a regiment.

In addition to the permanent sites, there are about 100 field sites near SS-4 complexes ([REDACTED] [REDACTED]). These sites are generally 2 to 15 nm from the permanent sites and are connected with the complex by roads. Each field site usually consists of four cleared and graded launch positions without support facilities, storage, or housing. In the past several years some have apparently been abandoned and others have been constructed. About 70 field sites appear to be suitable for use at the present time.

[REDACTED] characterize field sites as alternate launch points which would be occupied under certain circumstances by SS-4 units from the permanent sites. Training exercises have been detected regularly at the field sites [REDACTED] suggesting that this concept is still applicable. A complex probably lacks sufficient ground support equipment and manpower to utilize all the pads at the permanent and field sites at the same time.

#### SS-5 IRBM

Development of the SS-5 began in mid-1960 and was completed in late 1961 after nearly 30 firings.

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Like the SS-4, the SS-5 is deployed in both hard and soft launchers. The first soft launchers became operational in 1962 and the first silos in 1963. The deployment program ended in early 1965.

At its peak, the SS-5 force consisted of 101 launchers--50 soft pads and 51 silos. All SS-5 soft sites have four launchers, except for one site which has two launchers. Hardened SS-5 sites contain three silos arranged in a cluster. ([redacted])

Field sites for SS-5 units have not been identified, probably because the SS-5 system, which is more complex than the SS-4, requires more elaborate launch positions.

About 70 percent of the SS-5 launchers are deployed at widely dispersed complexes in the western USSR. The remainder are deployed in the Far East, the North Caucasus, and Turkestan. One soft site, now inactive, is at Ugol'nyy across the Bering Strait from Alaska (see map on page 6).

The Soviets at one time evidently planned more extensive deployment of the SS-5. Construction was begun on additional hard sites in three complexes but was abandoned at an early stage in the mid-Sixties. The reason for abandoning these sites is unknown.

All SS-5 soft launchers are believed to have a refire capability primarily because of [redacted] evidence on the capacity of storage facilities at the sites, the amount of equipment present, and the apparent similarity of SS-4 and SS-5 operational procedures. The hard SS-5 launchers may have a refire capability because storage buildings and equipment at the sites also appear excessive for a single launch mission. Such possible indications of a refire capability are not evident at SS-4 hard sites.

The organizational structure for the SS-5 is the same as for the SS-4. Launch sites normally are manned

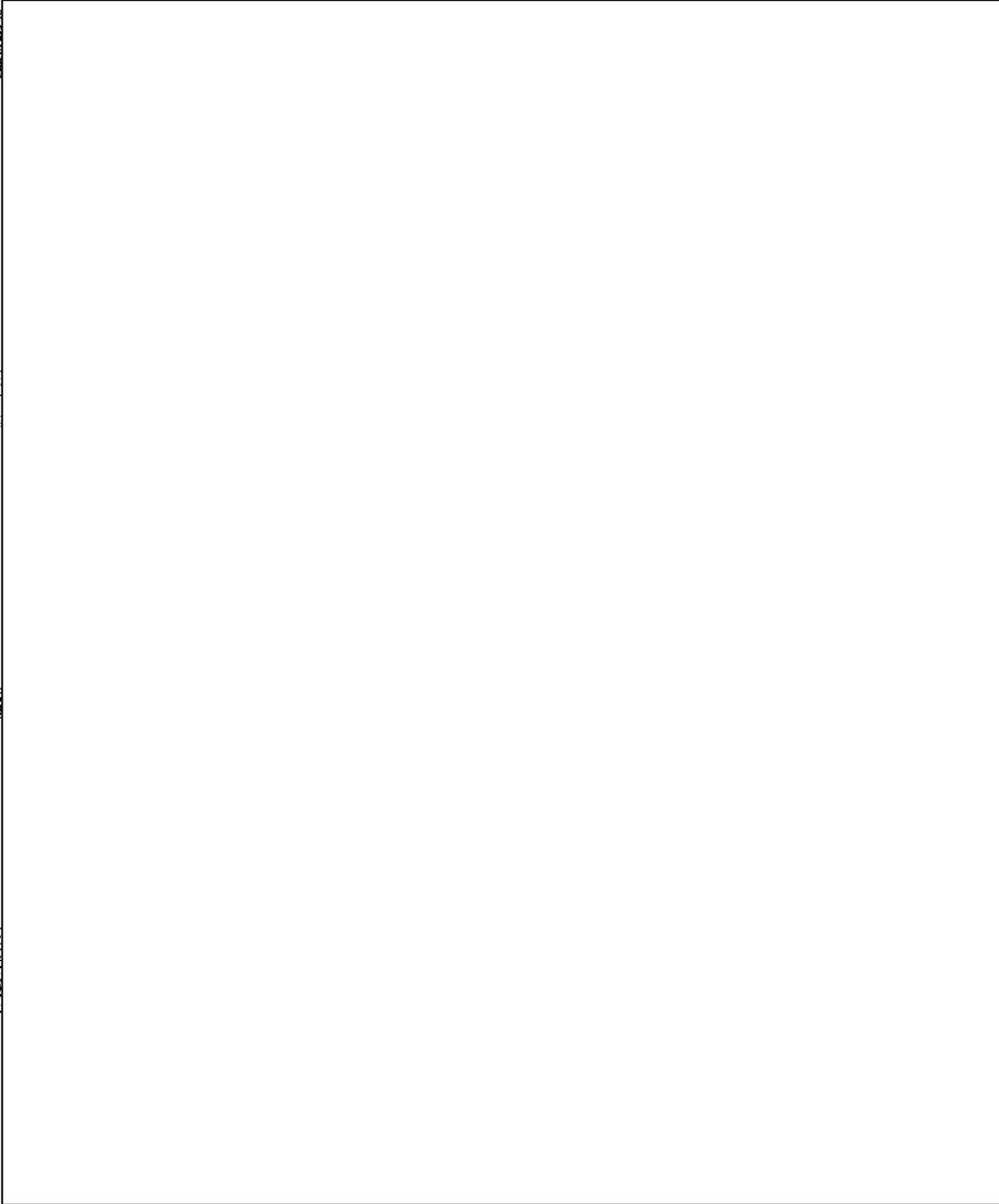
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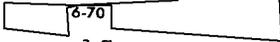
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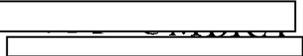
The SS-5 IRBM was deployed in limited numbers at hard and soft sites. The SS-5 sites are similar to those of the SS-4 system except that the pads are farther apart at soft sites and hard sites have three silos rather than four [redacted]



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by battalions, and groupings of two or three sites comprising a complex are regiments. In the two cases where there is only one site in a complex the manning units have been classified as independent regiments. In all, the Soviets deployed 12 SS-5 regiments, 11 of which are still operational.

#### Pattern of Changes in the Early Force

During the initial deployment of the peripheral ballistic missile force the Soviets strove to upgrade its capabilities (see illustration on page 17 for estimated technical characteristics of the three initial systems). The SS-3 was limited in range (630 nm) and in reaction time. It took an estimated 5 to 8 hours to reach a ready-to-fire status, which could be sustained for only about an hour, primarily because the missile used nonstorable cryogenic propellants.

The SS-4 provided a marked improvement over the SS-3 in range (1,020 nm) and reaction time. The use of storable propellants facilitated silo deployment, thus increasing force survivability. Silo deployment also improved the readiness posture because the SS-4 could be held in an alert condition for up to a few days.

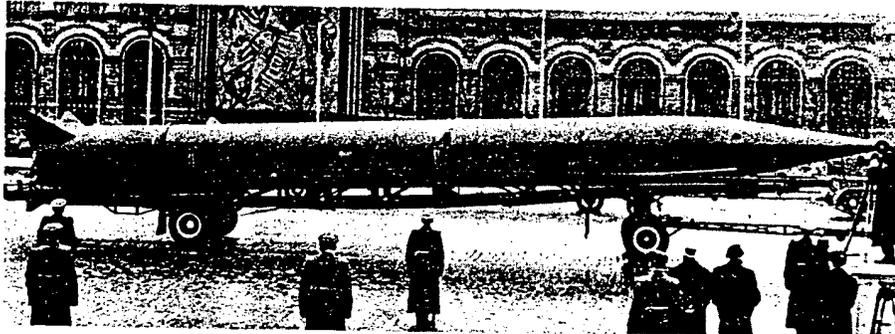
The SS-5 provided greater range (2,200 nm), improved accuracy, and a more powerful warhead to the force. With the SS-5 the Soviets could deploy launch sites farther from their borders and still strike targets the SS-4 could not reach. Like the SS-4, the SS-5 had storable propellants and could readily be deployed in hardened silos.

#### The Force in Transition, 1966-70

Since the basic deployment program was completed in early 1965 the Soviets have continued to improve the capabilities of the force. They have completely phased out the SS-3 and begun the phaseout of the vulnerable SS-4 and SS-5 soft sites. At the same time they have upgraded support facilities at many operational sites.

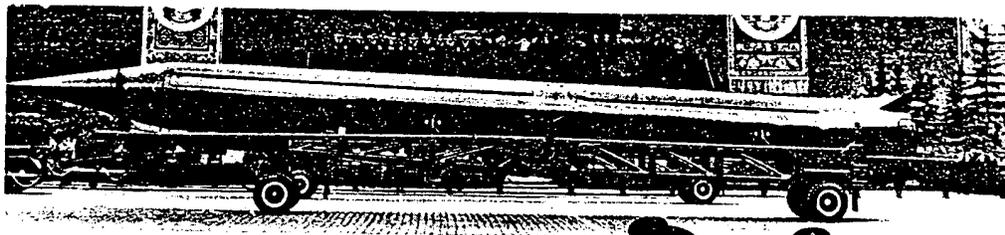
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## Initial Soviet Peripheral Missile Systems



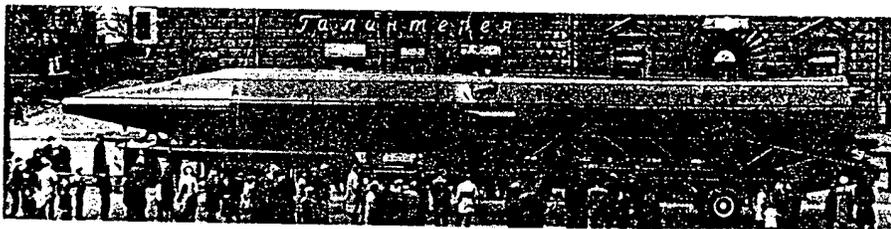
**SS-3 Shyster**

IOC *	1956
Range	630 nm
CEP	1.0 nm
RV weight	3,300 lbs
Propellant	cryogenic
Guidance	radio inertial



**SS-4 Sandal**

IOC *	1958
Range	1,020 nm
CEP	1.25 nm
RV weight	3,300 lbs
Propellant	storable liquid
Guidance	inertial



**SS-5 Skean**

IOC *	1961
Range	2,200 nm
CEP	0.5-0.75 nm
RV weight	3,500 lbs.
Propellant	storable liquid
Guidance	inertial

\*Development complete and missile ready for deployment.

They have also added new systems--the Scaleboard short range mobile missile and the SS-11 ICBM--which extend the lower and upper range capability of the force and increase its survivability through mobile and dispersed deployment. The Soviets' desire to further increase force survivability is evident in the current development of at least one and probably two follow-on mobile systems.

Deactivation of Sites

The first major change in the MRBM and IRBM force came with the phaseout of the SS-3. The 8 sites which remained equipped with the SS-3 after the early Sixties--two each at the Gvardeysk, Simferopol', Paplaka, and Mukachevo complexes--were deactivated between 1965 and early 1967. The exact date of deactivation is unknown [REDACTED]

[REDACTED] The two sites at Mukachevo were still operational in mid-1966 as evidenced by the presence of missile equipment, but all the sites were inactive [REDACTED] in early 1967.

Deactivations have also been evident in the SS-4 force. Since early 1967 at least 7 soft sites in the western USSR have been deactivated. In addition, 2 soft sites have been deactivated in the Soviet Far East but these units have apparently been relocated to another complex (see map on page 6).

The two sites--each with 4 launch pads--deactivated in the Far East were at Barano-Orenburgskoye, only 5 to 10 nm from the border with Communist China. Their deactivation in 1967 may have been prompted by the Sino-Soviet dispute. The addition of 4 SS-4 launch pads in 1967 to an existing site in the Kremovo complex some 50 nm from the border was probably related to this deactivation. [REDACTED] [REDACTED] a Barano-Orenburgskoye unit was transferred to the Kremovo area about the time of the deactivation and the new pad construction. At present, 4 more pads are under construction near Kremovo, and may be for the rest of the equipment removed from Barano-Orenburgskoye.

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The deactivations in the western USSR occurred during 1969 and 1970 and probably were related to the addition of the SS-11 to the peripheral missile force (see the section beginning on page 24). SS-4 equipment was removed from at least 7 soft sites-- 2 each at Uman', Derazhnya, and Balta and one at Zhitomir--all in the general area where new SS-11 deployment began in mid-1968. The timing of the deactivations and the proximity of the sites to the new SS-11 deployment suggest a direct relationship. The status of the SS-4 hard sites at Derazhnya and Uman' is unknown

SS-5 deployment has undergone few changes since the last site became operational in 1965. The isolated soft site at Ugol'nyy was deactivated during the summer of 1969. It was the only site in the original peripheral missile force from which missiles could be launched against the US. The deactivation of Ugol'nyy probably was due to the availability of ICBMs to cover the targets originally assigned to this site. The severe weather and logistical problems in this remote area probably were additional factors in the decision to deactivate the site.

Events in the last half of 1969 suggest that SS-5 deployment may be further reduced in the near future. The new SS-11 deployment near Pervomaysk probably will result in phaseout of the SS-5 from that complex. To date, however, no change has been detected in the operational status of the sites at Pervomaysk--normal complements of SS-5 ground support equipment have been detected

There was a slight decline in SS-5 firings during the past two years, which may indicate a cutback in crew training. Crew training launches are believed to be an indicator of the number of deployed launchers and a reduction in firings may signal a cutback in

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deployment. In 1969, 10 SS-5 launches were detected, as compared with 11 in 1968 and 14 in 1967. There were no launches from July to late December 1969, one of the longest standdowns since the SS-5 development program was completed in 1961.

SS-4 launches have remained at a relatively high rate despite the deactivations. There were 83 firings in 1967, 69 in 1968, and 81 in 1969. Many of these launches were part of the ABM test program at Sary Shagan, however, [redacted]

#### Force Improvements

The Soviets have continued to upgrade facilities at most sites despite the age of the systems and the deactivation of some sites. These changes have been primarily of two types: housekeeping improvements and force-wide modification programs. The housekeeping changes include minor additions such as small support buildings, firing ranges, and athletic fields. The force-wide projects, largely completed by 1967, have included the construction of major facilities at most complexes. Two such projects have been the addition of new vehicle maintenance facilities at 60 of the 71 SS-4 and SS-5 complexes and the construction of hardened communications facilities at 57 complexes.

In addition, major construction projects have been undertaken at certain complexes. For example, work continued on the nuclear warhead handling facilities at eight SS-5 sites for several years after the sites became operational and buildings probably are still under construction at one of these sites. Similarly, large fueling facilities have been built since 1968 at isolated SS-5 complexes at Taybola and Aktyubinsk. Missile fuel apparently was trucked to both complexes when needed, and these new facilities probably are intended to relieve this logistic problem.

The Soviets have undertaken a new program during the past two years to safeguard their peripheral

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[redacted]

missile sites from ground attack. Defensive trenches with firing points for individual and crew-served weapons have been dug at many sites throughout the force, including all but one of the sites near China. At several of these sites personnel bunkers have been added and protective walls constructed around fuel and oxidizer storage tanks.

[redacted]

The Addition of Scaleboard

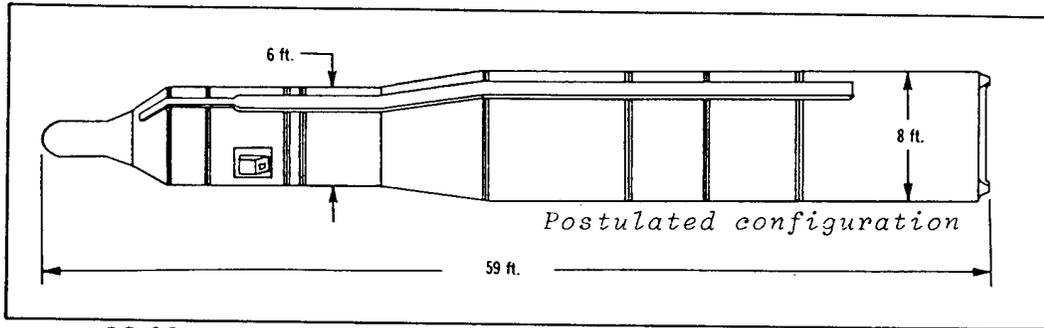
The SS-12 Scaleboard mobile missile system was added to the peripheral missile force in 1967 when it was deployed to new installations near existing Strategic Rocket Forces (SRF) facilities at Saryozek, Drovyanaya, and Kremovo [redacted] (see map on page 6). The Scaleboard installations are permanent bases consisting of a circular nine-pad launch area, support and maintenance facilities, and barracks. Although construction is continuing at each base, all the units are considered operational.

The pads at the permanent bases probably are no longer primary launch areas. Changes during the past year--the regular parking of support vehicles on some pads and the construction of facilities immediately adjacent to others--suggest that they are not intended for operational use, except under emergency conditions.

[redacted]  
[redacted] These sites--some or which have apparently never been occupied by Scaleboard units--have an unsurfaced launch area and contain no permanent facilities. They are apparently

[redacted]

### New Soviet Peripheral Missile Systems



<b>SS-11</b>	Initial flight	1965
	IOC	1969*
	Range	5,500 nm*
	CEP	[redacted]
	RV weight	1,500 ± 300 lbs
	Propellant	storable liquid
	Guidance	inertial

\*The SS-11 reached IOC in a peripheral role in 1969. The Soviets have been testing a modified version of the SS-11 which may have a range of about 6,100 nm (nonrotating earth). The CEP estimated is for the SS-11 fired in a peripheral role to ranges of 500 to 3,000 nm.



**SS-12 Scaleboard**

Initial flight	1964
IOC **	1965
Range	500 nm
CEP	[redacted] nm
RV weight	1,500 lbs
Propellant	prepackaged liquid
Guidance	inertial

\*\*Development complete and missile ready for deployment.

used for training, and may serve as primary launch areas. Simple presurveyed launch areas which have never been utilized for training exercises may also be used for launch operations.

Although apparently under SRF control, the Scaleboard appears to be a dual purpose system intended for both strategic and tactical missions. The missile in the Scaleboard system--probably the SS-12--is estimated to have a range of 200 to 500 nm. With this range, Scaleboard as now deployed can reach strategic targets only from the Kremovo area. The other two units appear to have the mission of attacking Chinese troop concentrations and of covering invasion routes.

The Scaleboard system adds mobility, improved survivability, and targeting flexibility to the peripheral missile force. It fills the gap between current operational strategic systems and the tactical system with the longest range, the 160-nm Scud B. The survivability of Scaleboard is greater than that of earlier peripheral systems because mobile launchers are difficult to detect and can move to new locations.

Scaleboard deployment may also have been planned as early as 1967 at two deactivated SS-3 sites in the western USSR--Gvardeysk and Simferopol'. New launch pads were added to both installations about the same time that construction commenced on Scaleboard bases near China. The new pads are fan-shaped, in contrast to those at the Scaleboard bases near China, which have an oval configuration.

[redacted]

The complete lack of Scaleboard equipment at Gvardeysk during the past three years and the [redacted] SS-4 training exercise there in April 1970 weakens the possibility that the Soviets still intend to deploy Scaleboard to that location.

Soviet intentions at Simferopol' are less clear. The level of activity at this site during the past three years has been low compared with that [redacted] at the Scaleboard bases on the China border. [redacted] the [redacted] single Scaleboard TEL at Simferopol' in April 1969, however, and [redacted] two TELs in April 1970 along with two Scaleboard missile dollies suggest that the Soviets will base a Scaleboard unit at this installation.

SS-11 in a Peripheral Role

The SS-11 ICBM apparently is being added to the peripheral missile force. SS-11 deployment was begun in 1968 at an IRBM complex at Pervomaysk and an MRBM complex at Derazhnya (see map on page 6). Previously, SS-11 deployment had occurred only at ICBM complexes. [redacted]

A peripheral attack role for the SS-11 at Derazhnya and Pervomaysk [redacted] [redacted] The new silos are farther south than any previous SS-11 deployment and are not optimally located for launches against the United States. Standard SS-11s at Pervomaysk and Derazhnya can still reach the US, but they are within range of fewer targets than SS-11s deployed at ICBM complexes.\*\*

[redacted]

*\*\* The Soviets have been testing a modified version of the SS-11 which may have a range of about 6,100 nm (nonrotating earth). Because the modified missile is still undergoing tests, it is unlikely that it has been deployed at Pervomaysk and Derazhnya. Silos still under construction there may be equipped with the modified version or presently operational groups may eventually be retrofitted. If so, SS-11s at Pervomaysk and Derazhnya could cover virtually the entire US.*

[redacted]

Another indication of a peripheral role for the SS-11s is the deactivation of seven SS-4 soft sites (28 pads)--two at Derazhnya itself, two each at Uman' and Balta, and one at Zhitomir. These sites are all near the new deployment and were all deactivated after the start of the new SS-11 deployment at Pervomaysk and Derazhnya, many about the time the first SS-11 silos became operational.

The status of other sites in the same general area is unknown [redacted].  
[redacted] It is not yet clear whether the new SS-11s are assuming the role previously assigned to the deactivated SS-4 launchers and if the SS-4 deactivations detected so far are part of a general phaseout of that system.

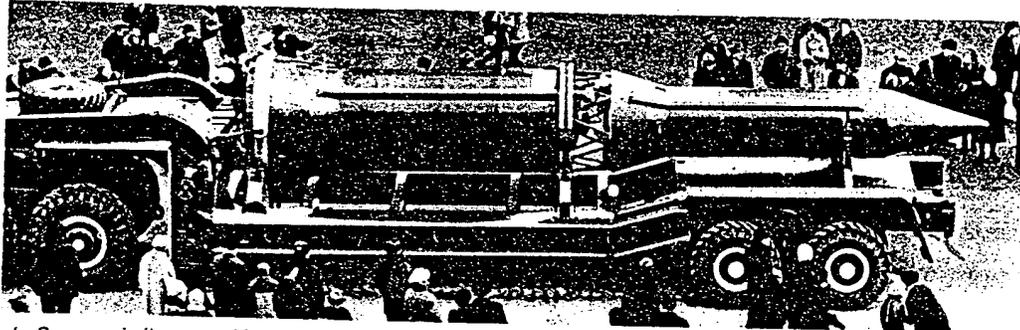
The new silos at Pervomaysk and Derazhnya, like SS-11 silos at ICBM complexes, are deployed in groups of ten. A total of 12 groups have been [redacted] under construction, 6 at Pervomaysk and 6 at Derazhnya. At present, 5 of the groups--50 silos--are operational and the remainder will become operational within the next twelve months. The full extent of the deployment planned at these locations is unknown, but the spacing between groups and past Soviet deployment practice indicate that there will be several more groups at each complex.

[redacted] suggest that SS-11 deployment may be taking place at other MRBM and IRBM complexes (see map on page 6). [redacted]

[redacted]

[redacted]

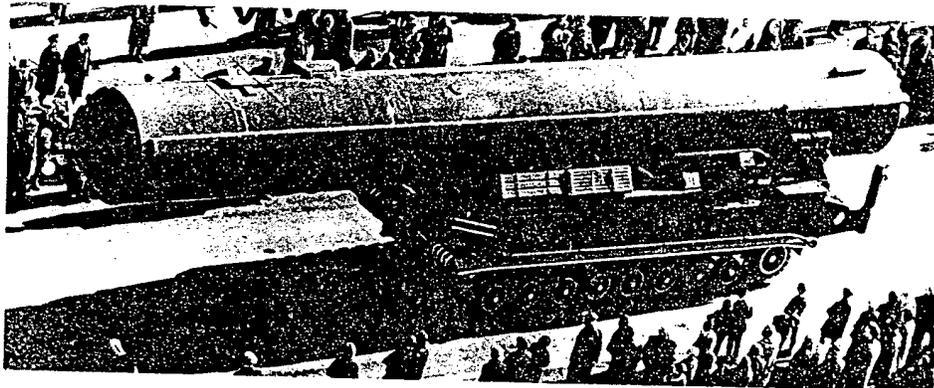
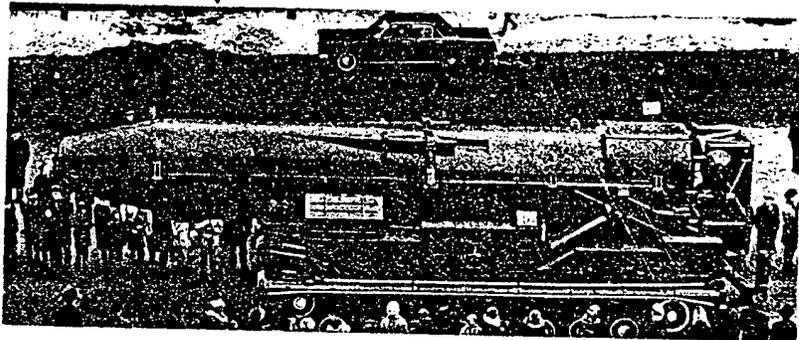
## Future Soviet Peripheral Missile Systems



▲ Scamp missile . . . and its transporter-erector-launcher ▼

### SS-14 Scamp

Initial flight	1965
IOC (projected)	1970
Range	1,500 nm
CEP	□ nm
RV weight	1,000 lbs
Propellant	solid
Guidance	inertial



### Scrooge

(Probably the PL-1,  
now called the SS-X-15.)

Initial flight	1968
IOC (projected)	1971-1972
Range	4,000 nm (approx.)
CEP	□ nm
RV weight	750-1,100 lbs.
Propellants	liquid in second stage, first stage unknown
Guidance	inertial

The SS-11 will significantly upgrade the capabilities of the peripheral missile force. The SS-11 can cover more peripheral targets than either the SS-4 or the SS-5. It will also increase the survivability of the force. SS-4 and SS-5 silos are in closely spaced clusters of three and four while individual SS-11 silos are 3 to 4 nm apart. One incoming warhead could attack only one SS-11 silo, but the same warhead could attack an entire cluster of SS-4 or SS-5 launchers.

#### Follow-on Systems

Two possible additions to the peripheral missile force are now being tested--the SS-14 (nicknamed Scamp) and the PL-1\*, probably the missile for the system nicknamed Scrooge (see photographs on page 26).

The SS-14, a mobile missile probably composed of the second and third stages of the solid propellant SS-13 ICBM, has been under development at Kapustin Yar since late 1965. To date, 17 test firings have been identified. Two firings in 1969 and one in 1970 may have been for troop training--an indication that research and development of the system is nearing completion. If so, the SS-14 could be deployed in 1970.

The SS-14 will probably be deployed in a mobile mode. Fixed deployment of this system probably is not intended, at least initially. Prototype silos were started for the SS-14 at Kapustin Yar in 1967 but have not been completed. In addition, no new silos which might be for this system have been detected in the field.

The other possible addition to the force--the PL-1, probably the Scrooge--is not as advanced in development as the SS-14. There have been 8 firings of this system from Plesetsk since the program began in 1968, 5 of which were successful. No firings have been identified since August 1969. At least one more year of testing probably would be required before the PL-1 could be ready for deployment.

\* *Now designated the SS-X-15.*

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Little is known of the PL-1's characteristics, but it appears to be a two-stage vehicle with at least the second stage utilizing liquid propellants. The PL-1 could be either an IRBM or possibly an ICBM. The maximum range of the missile appears to be about 4,000 nm. If this estimate is correct, the missile probably would be deployed only as an IRBM--an ICBM with this range would have to be deployed in the far northern area of the USSR to strike many US targets, creating difficult problems of maintenance, support, and operations.

Several factors suggest that initial deployment of the PL-1 will probably be in a mobile mode. First, [REDACTED] indicate [REDACTED] launch point at Plesetsk is a soft pad where the Scrooge transporter-erector-launcher has been [REDACTED]. Second, construction has been halted on possible prototype silos adjacent to the soft pad. Finally, no silo construction which might be intended for the PL-1 has been evident in the field.

#### Mission of the Force

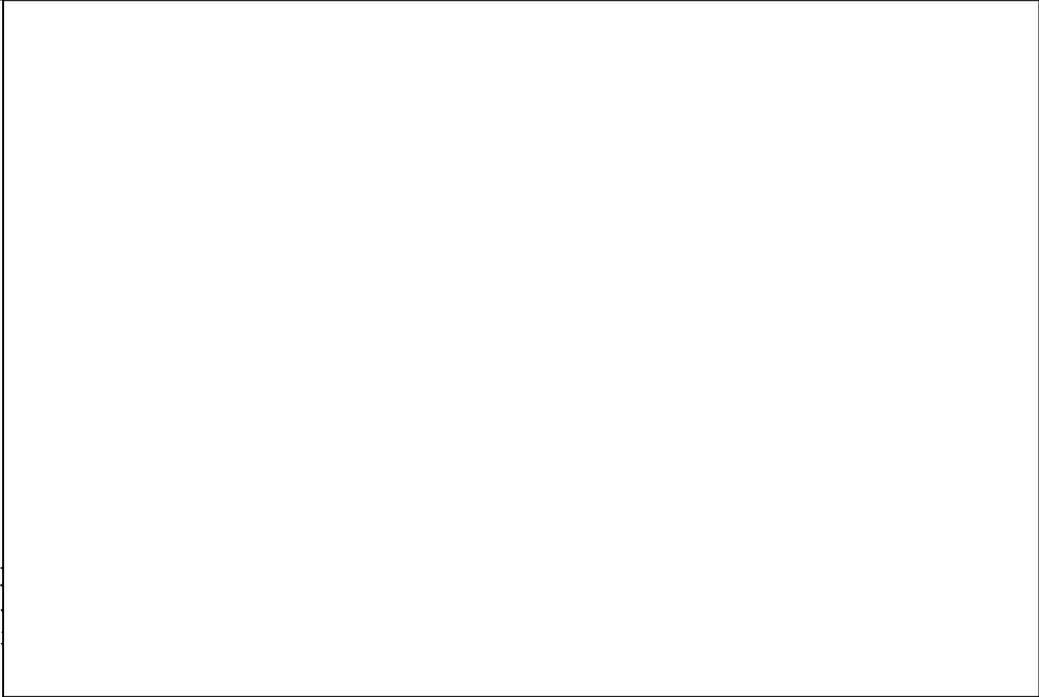
The primary mission of the peripheral ballistic missile force as stated [REDACTED] is to destroy nuclear and other strategic targets of the enemy in areas near the borders of the USSR. Its secondary mission probably is support of theater forces.

#### The Initial Target Mix

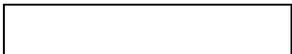


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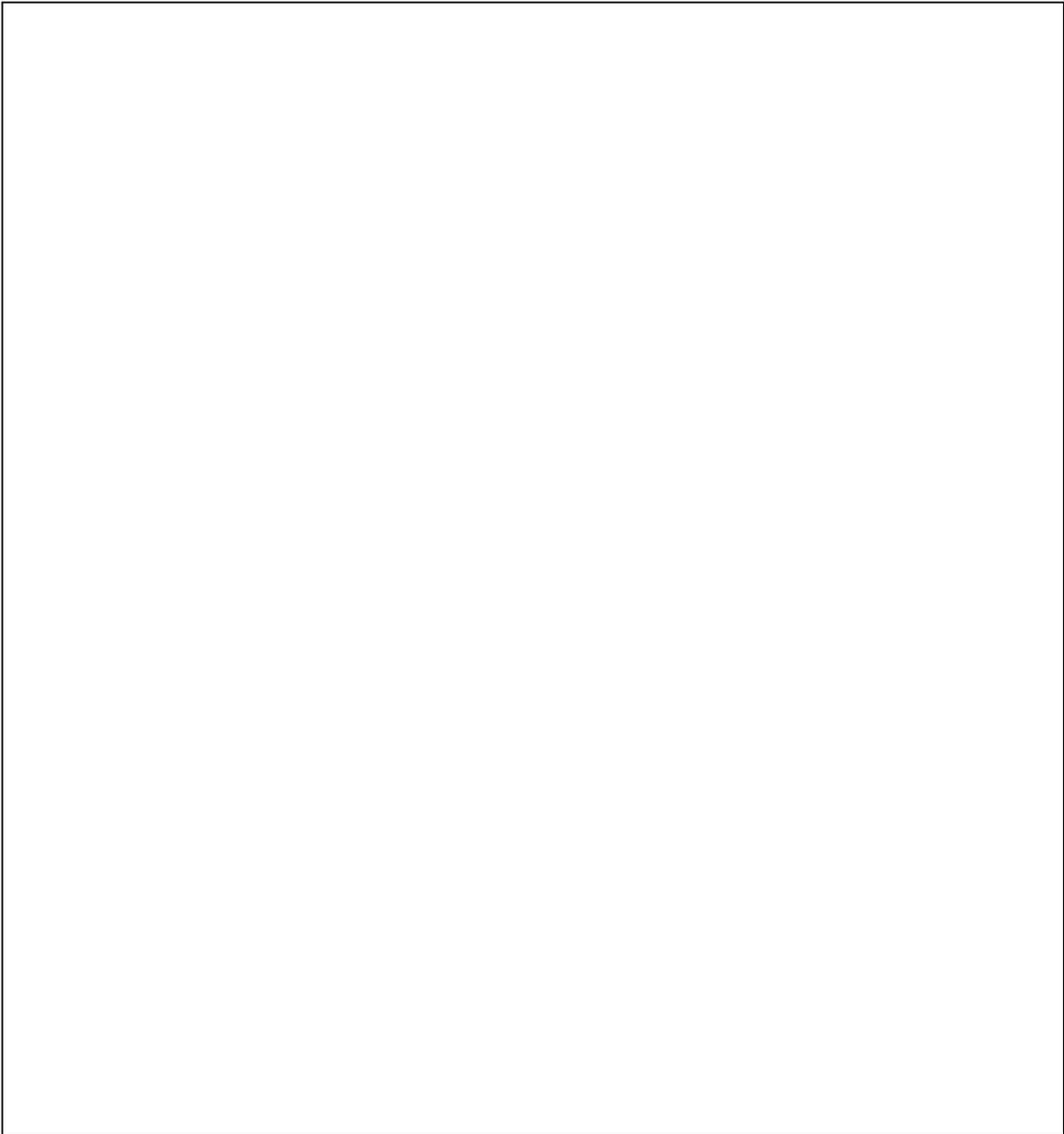
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Rationale for the Force

In relation to the number of probable primary targets, the size of the Soviet peripheral missile force has always seemed excessive. The initial force contained about 700 launchers plus about 600 refire missiles. The Soviets have maintained about the same

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force level despite the deactivation of many facilities which probably were targets.

One explanation for the size of the force is that the Soviets plan to use more than one missile for some targets. This explanation is consistent with a claim made by Premier Khrushchev in 1960 that as many as three missiles were assigned to some targets. It is also consistent with Soviet MRBM exercises conducted in the Far East during the late Fifties, in which initial strikes were to be followed by second launches against some targets. The abundance of Soviet peripheral missile launchers probably also made allowance for the loss of some sites to enemy action.

The size of the initial force may also have been affected by a shift in Soviet military strategy evident at the beginning of the Sixties. Premier Khrushchev announced plans in January 1960 to reduce Soviet conventional forces by one-third, while increasing the size of the missile forces.

Until then, the ground forces had been the dominant element in Soviet military planning. Under Khrushchev's "new military policy," which was strongly debated in the Kremlin, strategic missiles would have replaced many of these forces. Khrushchev justified this shift on the grounds that nuclear weapons would deliver the decisive blow in any future war and consequently the requirement for ground forces was greatly reduced. Although these ground force reductions were never fully implemented, this strategy may have influenced the extent of peripheral missile force deployment.

#### Relationship to Other Strike Forces

##### Peripheral Forces

Strategic missiles are only one component of the Soviet peripheral attack force, which also includes medium bombers and diesel powered ballistic missile submarines (see table on page 32). The Soviets probably developed this tri-service peripheral

Soviet Peripheral Attack Forces  
1 June 1970

Land-based missiles

SS-4 MRBM	544
SS-5 IRBM	97
SS-11 ICBM	50*
Scaleboard	27-36
Total	<u>718-727</u>

Diesel powered ballistic missile  
submarines (launchers)

G-I, G-II	19 submarines with total of 57 launchers**
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Medium bombers

TU-22 Blinder	175
TU-16 Badger	550
Total	<u>725</u>

\* Seven more launch groups of 10 silos each are under construction.

\*\* Nine additional launchers are in three submarines now being modified.

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strike force to take advantage of the unique capabilities of each component, including the relative survivability of submarines on patrol, the short reaction time of missiles and their relative invulnerability to existing defensive measures, and the accuracy and multipurpose munitions delivery capability of the bombers.

The relationship among the missions of each of the components of the peripheral strike force is not clear. Soviet command exercises in 1959 indicated that one mission of the medium bombers is to make follow-up nuclear strikes on targets previously attacked by land-based missiles. It is also likely that medium bombers are assigned missions against targets which do not need to be destroyed at the very onset of hostilities. The bombers can also deliver nonnuclear munitions against peripheral targets in a conventional or limited nuclear war.

The principal mission the Soviets have assigned the diesel powered ballistic missile submarines probably is attacking US island bases and strategic coastal targets in Eurasia.

#### ICBM Forces

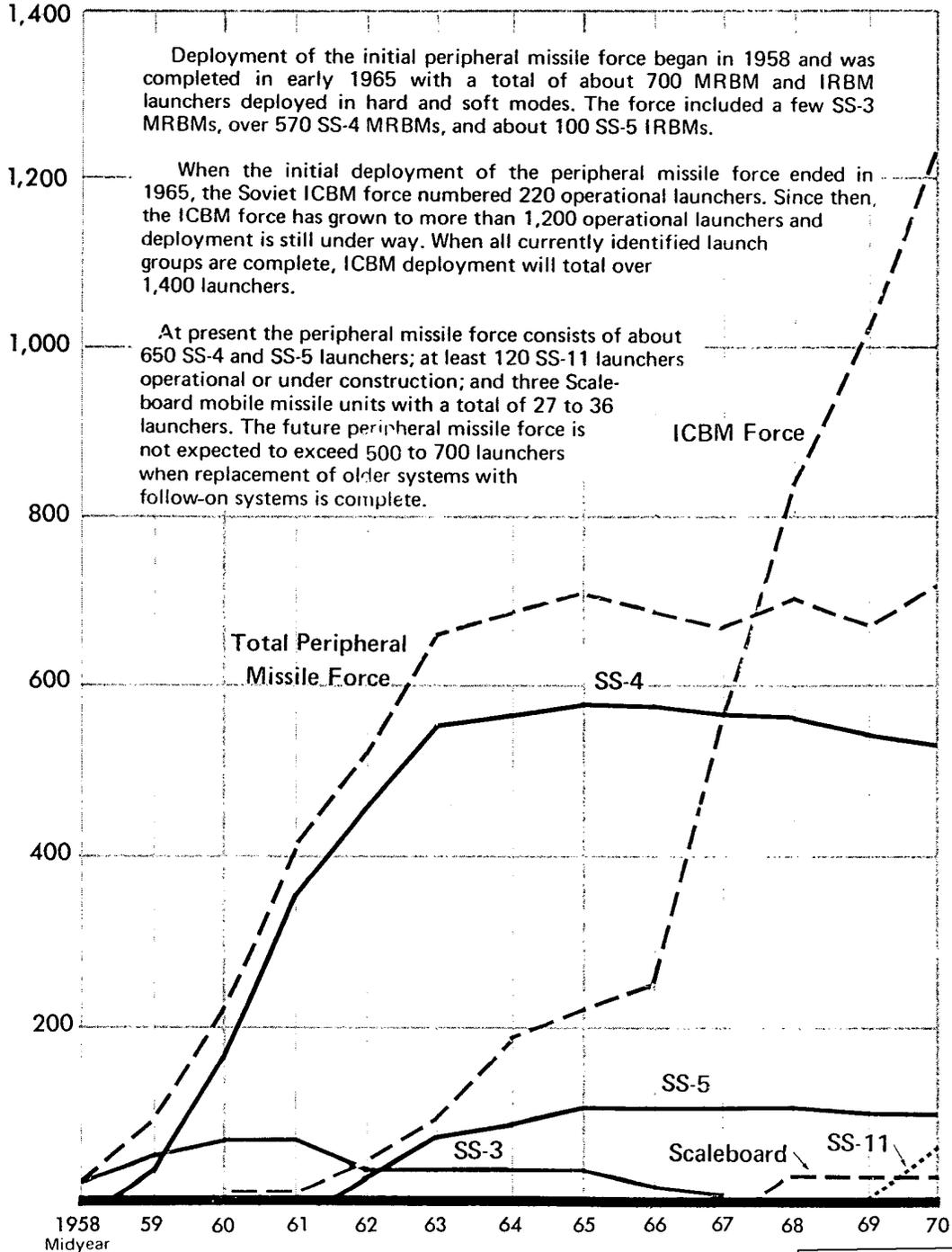
The initial peripheral missile force was essentially complete before significant numbers of ICBM launchers were operational. When deployment of the SS-5 ended in early 1965, the Soviet ICBM force numbered only 224 operational launchers--4 SS-6s, 197 SS-7s, and 23 SS-8s (see chart on page 34). The disparity in size between the peripheral missile and ICBM forces probably resulted from political and strategic considerations prevailing in the Fifties. At that time, the Soviets were faced with nuclear forces based both in the US and on the periphery of the USSR--all capable of striking the Soviet Union.

To counter the threat the Soviets probably would have preferred to deploy a strategic attack force with a capability to strike targets in the US. Their heavy bomber force was small, however--only 110 aircraft

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## Growth of Soviet Strategic Missile Forces, 1958-1970

Number of  
Operational Launchers  
(Cumulative)



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in 1958--and they had not yet developed an effective ICBM which they could deploy soon enough or in sufficient numbers to provide a credible deterrent. The Soviets could have expanded their long range bomber force but apparently took a calculated risk by deferring a greater intercontinental capability until an effective ICBM was ready for deployment.

The Soviets chose instead to build a large peripheral strategic attack force, probably hoping to deter the US by holding Europe hostage. Their decision probably was influenced by the fact that the technology and capability to produce and deploy a large number of MRBMs was already at hand.

The Soviets did not rely entirely on the peripheral missile force as a deterrent. They also utilized tight security and propaganda about their ICBM capability to deter the US. After the first successful test firing of the SS-6 ICBM in mid-1957, Khrushchev and other Soviet leaders made numerous public statements about their growing ICBM force. These pronouncements, coupled with a lack of hard intelligence about Soviet ICBM deployment, led to the missile gap controversy of the late Fifties.

The shutdown of a U-2 reconnaissance plane in May 1960 provided the Soviets with photographic evidence that the myth of their ICBM force could be exposed. In subsequent statements, Premier Khrushchev attempted to minimize the significance of these flights by claiming that Soviet ICBMs were deployed in areas not covered by U-2 flights. By mid-1961, however, the US was fully aware [redacted] that the Soviets had only a few operational ICBMs. This disclosure, coupled with the rapid buildup of the US ICBM force, almost certainly was a factor in the Soviet decision to deploy SS-4 and SS-5 missiles in Cuba during 1962. The MRBM and IRBM launchers in Cuba probably were intended to give the Soviets an interim missile capability against the US until more ICBM launchers were operational.

Following the Cuban missile crisis, the Soviets began an orderly buildup of their ICBM force--a buildup which has continued unabated. At present, the

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Soviets have more than 1,240 operational launchers at ICBM complexes, including 197 SS-7s, 23 SS-8s, 222 SS-9s, 780 SS-11s, and 20 SS-13s. When all currently identified launch groups are complete, Soviet ICBM deployment will total 1,422 launchers. Because of this buildup, the relative importance of the peripheral missile force as a Soviet deterrent to US attack has greatly diminished.

Force of the Future\*

Changes now under way in the peripheral missile force will result in a follow-on force of considerably improved capabilities. The remaining components of the original force--the SS-4 and the SS-5--will probably be removed in favor of systems which will extend force range and increase survivability. The future force probably will eventually consist entirely of missiles in dispersed single silos and mobile launchers--the SS-11, the Scaleboard, the SS-14, and possibly the PL-1. Although this force will contain a greater mix of systems, its size probably will be on the order of 500 to 700 launchers.

Phaseout and Replacement

Phaseout of the current force of SS-4s and possibly of the SS-5s now appears to be under way. Improvements at several deployed sites during the past two years, however, coupled with the relatively constant number of troop training firings for both systems suggest that the phaseout will be spaced over several years.

The Soviets probably will first deactivate the more vulnerable soft sites, as they have the SS-4 soft sites at complexes near Derazhnya and Pervomaysk. Although deactivations of only a few SS-4 sites--and the remote SS-5 soft site at Ugol'nyy--have been detected, it is likely that additional sites not covered recently [redacted] are also no

\* *The discussion in this section considers what might develop in the absence of a strategic arms limitation agreement including the peripheral ballistic missile force.*

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longer operational. The SS-4 and SS-5 hard sites probably will be the last elements of the present force to be deactivated.

The rate of SS-4 and SS-5 phaseout will depend on the introduction of new systems. Soviet practice in the present SS-11 deployment at Pervomaysk and Derazhnya suggests that follow-on missiles will be deployed before or concurrently with phaseout of the older systems. As more of the new SS-11s become operational, additional soft sites will probably be deactivated.

More SS-11 deployment in a peripheral role is expected but the extent cannot be determined on the basis of the evidence now available. If the SS-11 will be a total replacement for both the SS-4 and the SS-5 launchers, SS-11 deployment in a peripheral role could be on the order of 500 to 600 launchers. In view of the greater capabilities and increased survivability of the SS-11, however, it is more likely that its deployment in a peripheral role will be limited to 250 to 400 launchers.

Part of the current force may be replaced by the SS-14, which probably will be introduced in a mobile mode in 1970. Part of the force might also be replaced by the PL-1 if it is intended as a peripheral system. The extent of mobile deployment will depend on whether the Soviets view mobile systems as a major component of the force or as a supplement to fixed deployment.

Mobile systems may be based at deactivated MRBM and IRBM sites where existing facilities could be utilized for support. Such basing would be consistent with Scaleboard deployment, where some buildings at adjacent Strategic Rocket Forces installations have been utilized.

The SS-14 and the PL-1 may also be deployed later in a fixed mode, but inasmuch as the SS-11 is being deployed in a peripheral role in fixed sites this likelihood is not great.

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Mix of Systems

During the transition between the phaseout of old systems and new deployment there might be as many as six different missiles in the force. This interim force would include some SS-4s and SS-5s as well as the Scaleboard, SS-11, and SS-14 and possibly the PL-1. Such a conglomerate of systems would be costly to maintain and would pose considerably more logistical and training problems for the Soviets than the present force.

Even after older systems have been phased out, the force of the future will contain a greater mix of systems and types than the original force. By the mid-Seventies there apparently will be at least three and possibly four missile systems in the force--the Scaleboard short range ballistic missile, the SS-14 MRBM, the SS-11 ICBM, and possibly the PL-1 IRBM. In contrast to the original force, it may contain only one fixed system, the SS-11, and possibly three mobile systems.

The ratio of fixed to mobile launchers is difficult to project. It will depend in part on whether refire is still an essential element in Soviet operational planning for the peripheral missile force--refire added almost 600 additional missiles to the original peripheral force. If the Soviets still see the need to have a force of about 1,300 missiles--initial launch plus refire--mobile deployment might number several hundred launchers because SS-11 silos do not have a refire capability and the mobile launchers probably do.

The SS-11 may be the only silo-launched peripheral system in the future because systems currently under development do not appear intended for fixed deployment. A new development program would take at least 18 months before a system would be ready for deployment. Another six months or so would be required before the first field launcher would become operational even if--as is Soviet practice--silo construction is concurrent with the test program.

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The Soviets also have the option of deploying other ICBMs in a peripheral role. Of the current operational ICBMs, the SS-13 is the only system for which new sites might be constructed for use in that role. The SS-7 and SS-8 are probably no longer in production and the SS-9 carries warheads with yields far in excess of most peripheral requirements. Any operational ICBM, however, could be used against peripheral areas from existing complexes.

#### Improved Capabilities and Survivability

The new systems will greatly improve the capabilities of the future force. The addition of Scale-board reduces the minimum range of the force to about 200 nm, and the SS-11 extends the maximum range to at least 5,500 nm. The force will be able to engage targets on the periphery of the Soviet Union and also cover all of Europe, Asia, Africa, the Middle East, and much of the United States. Mobile systems probably will be used against soft targets and will be able to relocate for survivability or move in support of ground forces.

Single silos and mobility will enhance the survivability of the future forces. One incoming nuclear warhead could destroy all three or four SS-4 or SS-5 launchers at a hard or soft site. The dispersion and hardness of follow-on fixed systems will make each launcher a separate aiming point. Only when a mobile launcher is located in its base area will it be vulnerable--in the field it will be able to move frequently to avoid detection and targeting.

The reaction time of the new force should also be better than that of the current one. Reaction time for the SS-4 and SS-5 soft launchers varies from 30 minutes to several hours depending on the state of readiness and silo-launched SS-4 and SS-5 missiles can be fired in 3 to 5 minutes. In contrast, SS-11 reaction time is estimated to be half a minute to 3 minutes and mobile systems probably have

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a launch capability on the order of one minute at peak readiness. If at less than peak, the reaction time for the mobile systems would vary considerably and could be as much as several hours.

#### Size and Distribution of the Future Force

The overlap between phaseout of older systems and the introduction of new ones may cause the number of operational peripheral launchers to increase during the transition period. There is no firm basis for judging the future size of the follow-on peripheral missile force, but the fact that the Soviets maintained a large and costly force of SS-4 and SS-5 launchers despite significant changes in the target mix suggests that they regard a force of at least 500 to 700 launchers as essential.

Since almost all the launchers in the original force probably had a refire capability, the number of launchers in the future force could be larger. The ultimate size of the future force will depend in large measure on three factors: the Soviet view of the threat from the West, the state of Sino-Soviet relations, and the capabilities of follow-on systems (and, of course, on the timing and nature of any arms limitation agreement with the US).

The future peripheral missile force probably will be more evenly dispersed throughout the Soviet Union than the present one. Improved force capabilities and a more widely distributed target structure may cause some geographical shifts in deployment. More launchers probably will be deployed in the central and Far Eastern USSR to target Chinese missile deployment and US facilities in Southeast Asia. A large number of launchers will remain deployed against Western Europe because of the number of targets in that area. Deployment of the SS-11 in a peripheral role will permit the Soviets to target both Asian and European targets from the same complex.

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Cost Implications

Spending Through 1970

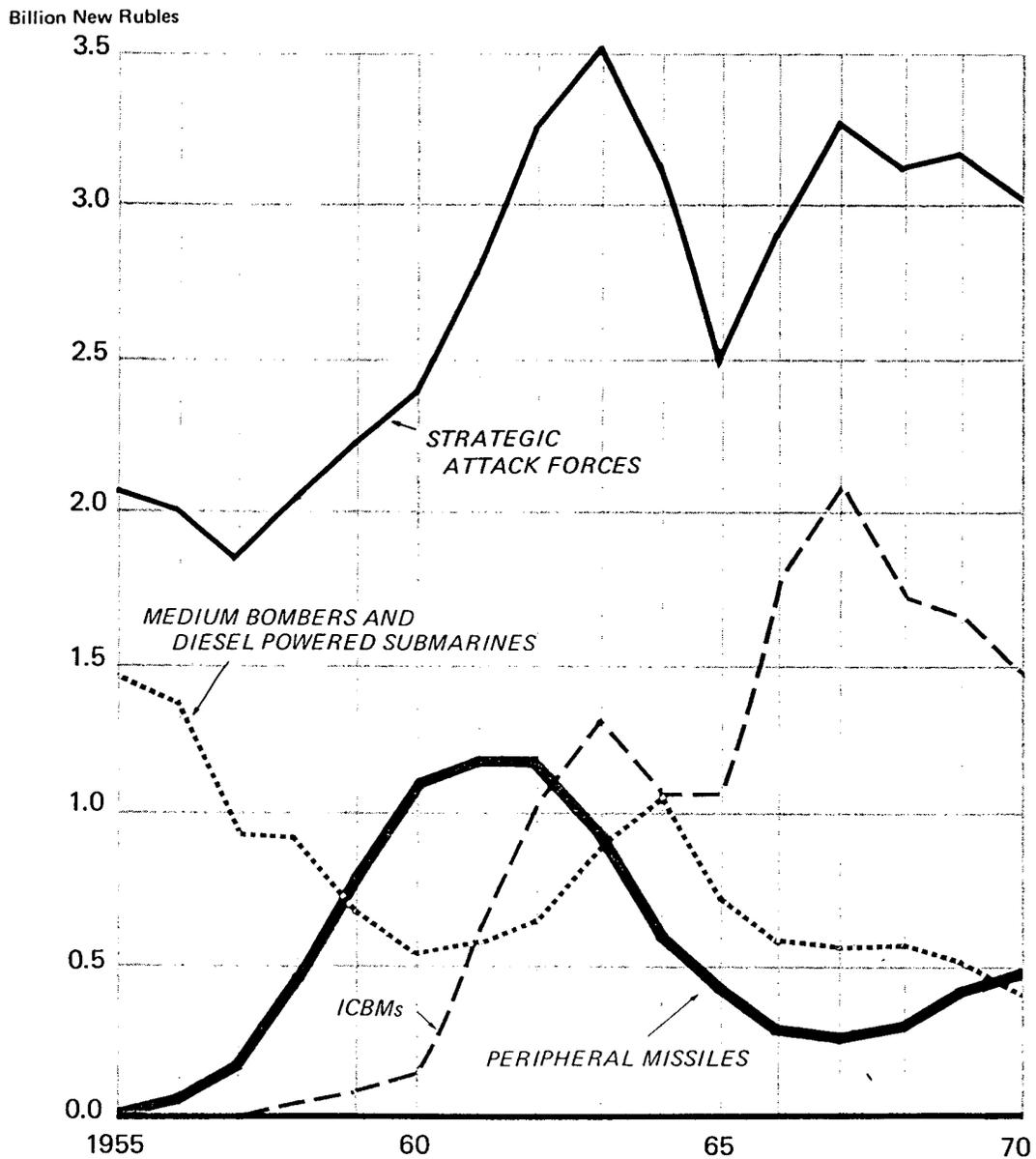
Estimated Soviet spending for the peripheral ballistic missile program from its inception in the middle Fifties through 1970 amounts to about 9 billion rubles (the equivalent of about 19 billion dollars).<sup>\*</sup> This is nearly half the spending for the entire peripheral strike force--which also contains medium bombers and diesel powered ballistic missile submarines--during this period.

Spending for peripheral missiles exceeded that of the other elements of strategic attack forces during the late Fifties and early Sixties, but cumulative expenditures through 1970 account for only about 20 percent of total strategic attack spending. A sharp decrease in the spending for the peripheral missile force was reflected in the strategic attack expenditures for the Sixties (see chart on page 42). The most pronounced change occurred in 1963 when the SS-4 and the SS-5 deployment programs began to taper off and ICBM programs were pursued with greater emphasis.

*<sup>\*</sup> The dollar figures (appearing in parentheses after the rubles) are approximations of what it would cost to purchase and operate the estimated Soviet programs in the US. A specific ratio of rubles to dollars is used for each resource input to Soviet military programs. As the mix of these resources changes during a program, the overall ratios of spending change.*

*With the exception of expenditures for research, development, test, and evaluation, all costs of the peripheral missile force and the total strategic attack mission are reflected in the expenditure figures in this section.*

### Soviet Expenditures for Strategic Attack Forces, 1955-1970



This chart shows estimated Soviet expenditures (operating and investment) for the three components of the peripheral strike forces--peripheral missiles, medium bombers, and diesel powered ballistic missile submarines--and for ICBMs. The total expenditures for strategic attack forces include heavy bombers and nuclear powered ballistic missile submarines as well as the components shown. Expenditures for research, development, test, and evaluation are not included.

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After reaching a peak level of 1.2 billion rubles (2.4 billion dollars) in both 1961 and 1962, when the peripheral missile force was a prime element of the Soviet nuclear attack capability, annual spending for MRBMs and IRBMs steadily declined to a low of 260 million rubles (820 million dollars) in 1967. This decline in spending reduced the peripheral missile force share of total strategic attack spending from just over one-third in 1962 to less than 10 percent in 1967. These lower levels of spending reflected the reduction in investment resulting from the completion of deployment of the SS-4 and SS-5 by the middle Sixties. The complete phaseout of the SS-3 system in the middle Sixties contributed to the reduction but to a lesser extent.

The beginning of the phaseout of the initial force components and their replacement with new systems is reflected in the pattern of expenditures during 1968-70. Investment spending increased during 1968 and 1969 as a result of deployment of the SS-11 at IRBM and MRBM complexes and of construction at Scaleboard bases near the Sino-Soviet border. Operation of SS-4 and SS-5 sites still accounted for most of the spending, although the deactivation of some sites is gradually reducing the amount being spent.

In 1970 further deployment of the SS-11 in a peripheral role and the probable introduction of the SS-14 in a mobile configuration will cause investment to continue to rise and to exceed operating costs for the first time since 1964. This upturn in spending for new systems during 1970 probably will more than offset any savings that may result from cutbacks in SS-4 and SS-5 deployment.

#### Expenditure Outlook

The peripheral missile force of the future may require average annual outlays as low as about 450 million rubles (1.1 billion dollars) or as high as 600 million rubles (1.4 billion dollars) for 1971-75, depending on the quantitative and qualitative improvements that are made. The lower level assumes that the Soviets will retain some of their older

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SS-4 and SS-5 launchers, deploy about 300 SS-11 launchers in a peripheral role, and supplement these with about a hundred mobile launchers. The higher level of expenditures would pertain if the older systems were phased out completely, the mobile element of the force were as large as 375 launchers, and SS-11 deployment ranged from 300 to 400 launchers.

These levels of spending are higher than the average annual expenditure of about 350 million rubles (1.0 billion dollars) for the force that was maintained during the 1966-70 period. They are, however, substantially below the annual costs incurred during the early Sixties when deployment of the original force was at its highest level.

It is almost certain that the Soviets plan to continue to deploy new peripheral missile systems through the middle Seventies. The actual size and composition of the future force will be influenced largely by changes in the military situation on both the western and eastern frontiers of the USSR (and, of course, on the timing and nature of any strategic arms limitation agreement with the US).

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Summary

The Soviet peripheral ballistic missile force fills the gap between the tactical and intercontinental missile forces. It is directed principally against US and allied nuclear delivery systems and other strategic targets around the periphery of the Soviet Union. It is a major component of the Soviet peripheral attack force, which also includes medium bombers and some of the USSR's ballistic missile submarines.

The peripheral missile force was established in early 1958 with limited deployment of the SS-3. Over the next seven years it grew to a force of over 700 launchers, including a few SS-3s, over 570 SS-4 MRBMs, and about 100 SS-5 IRBMs. Deployment in hard silos consisted of 84 SS-4 and 51 SS-5 launchers. About 90 percent of the force was deployed in the western USSR, with the remaining launchers located near border areas in the rest of the country. From its inception, the Soviets continually upgraded force capabilities.

Major changes have been under way in the composition of the force since the mid-Sixties. The SS-3 has been completely removed from the operational inventory and one SS-5 soft site and several soft sites for the SS-4 have been deactivated.

These reductions have been offset by the addition of the Scaleboard mobile missile and the SS-11 ICBM to the peripheral force. At present, Scaleboard deployment is limited to three units near China with a total estimated complement of 27 to 36 launchers. Current SS-11 deployment consists of 12 groups (120 silos) at Pervomaysk and Derazhnya--6 groups (60 silos) at each complex--with more deployment likely at both locations and possibly in other areas.

Tests are currently under way on two systems which may be added to the force in the near future--the solid propellant SS-14 Scamp and the PL-1, probably the missile used in the Scrooge system. The SS-14 is well advanced in testing and could be operational in a mobile mode in 1970. The PL-1 probably will also be deployed in a mobile mode, but could not enter service before mid-1971.

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The follow-on force which is now being formed will contain a greater mix of systems and have considerably greater range and survivability than the original force. The main components of this force probably will be the SS-11, the SS-14, the Scaleboard, and possibly the PL-1. Deployment of these systems will take place over the next several years, and the SS-4 and the SS-5 will probably be removed from the operational inventory. Currently, there is no good basis for estimating the extent of deployment for each new system or the ratio of mobile to fixed launchers.

The overall size of the peripheral missile force probably will be about 500 to 700 launchers, but the total will depend on factors such as the changing target structure in peripheral areas, the capabilities of follow-on systems, the state of Sino-Soviet relations, and the timing and nature of any strategic arms agreement with the US. Whatever the size, the future force probably will be more evenly dispersed throughout the Soviet Union than the current one. The new systems will improve force reaction time and survivability, in addition to providing range coverage from 200 to at least 5,500 nm.

To date, the Soviets have spend about 9 billion rubles (the equivalent of 19 billion dollars) on their peripheral missile force. The largest expenditures occurred in the early Sixties when deployment of the initial force was at its peak. Spending levels declined in succeeding years to a low of 260 million rubles (820 million dollars) in 1967. Since then, investment spending has increased as a result of the deployment of Scaleboard and the SS-11 in a peripheral role. Investment probably will continue to increase in the early Seventies with the deployment of follow-on peripheral systems.

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