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A STUDY OF THE SOVIET GROUND FORCES

A Second Report
of the
CIA/DIA Panel for a Special
Study of the Soviet Ground
Forces for Secretary McNamara



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A STUDY OF THE SOVIET GROUND FORCES: A SECOND REPORT

The Problem:

To re-examine the evidence and assess the level of confidence or range of uncertainty applying to the gross capabilities of the Soviet ground force in terms of land combat equipment and conventional ammunition.

The Scope of this Report

On 10 September 1963 an interim report* which had been prepared by a special CIA/DIA Panel was forwarded to Secretary McNamara. The 1963 report was, in effect, the CIA/DIA Panel's answer to the Secretary's questions regarding the number of major line elements in the Soviet ground forces and the gross capabilities and mobilization potential of the force in terms of available military manpower. This report addresses itself to the evidence on the inventory of Soviet land combat equipment and conventional ammunition currently available to the Soviet ground force and the conclusions which can be based on the available evidence. As was the case in the previous Panel report, the findings presented in this report are based on exhaustive research and analysis. The term "land combat equipment" or "land armaments" is defined to include armored vehicles, artillery and mortars, rocket launchers, small arms and other infantry weapons, and special vehicles (such as amphibians, artillery prime movers and tank recovery vehicles). It does not include

* A Study of the Soviet Ground Forces: an Interim Report of the CIA/DIA Panel for a Special Study of the Soviet Ground Forces for Secretary McNamara; 21 August 1963, [REDACTED]

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tactical missiles, army or tactical aviation, communications and other electrical or electronic gear not integral to land combat equipment, or general purpose vehicles and support equipment (such as trucks, graders, scrapers, dozers, cranes and bridges).

Summary

The Panel has examined the evidence from all sources on the inventory and rates of acquisition of land combat equipment and ammunition by the Soviet ground force*. We find that the flow of information on this subject has diminished greatly since the immediate post-world war II period with very little information becoming available in recent years. Current information is fragmentary and inconclusive.

The Panel concludes from its review that the evidence is adequate for understanding the general nature of the Soviet effort to develop, produce, and maintain various types and models of modern equipment. However, the Panel concludes reluctantly that evidence is insufficient to determine numbers of items in the existing inventory within useful confidence limits. The Panel also finds that evidence on rates of production is inadequate to determine confidently a range of inventories from possible cumulative production. The evidence permits a wide selection of assumptions concerning production capacities, rates, and duration, except for a small number of unrelated items. Various

* Very generally, the Soviet ground force is defined to include those Soviet military personnel performing functions similar to most of those performed by the US Army with the principal exception of continental air defense.

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estimating procedures were examined but none were found which would reduce the range of uncertainty to useful proportions.

Problems of quantification aside, the Panel has little doubt that the Soviets have produced and maintained large quantities of a wide selection of items. As many as 80 models of land combat equipment may have been produced in quantity since the end of World War II. There is firm evidence from a variety of sources to support quantity production of about 60 models. There is reasonably good evidence to justify the belief that the extensive land armaments industry known to be in operation in 1950 still exists and retains much of its output capacity. This capacity is almost certainly large enough to have produced in large quantities all the 80 models and types observed. In addition, the evidence has shown that the Soviets go to remarkable lengths to preserve the useful life of their inventory.

New equipment has been sent to field units at a gradual, sometimes almost leisurely, rate. The Panel has not been able to relate the rate of distribution of equipment to the rate of production. It is possible that some new equipment is sent directly to storage as combat reserve, although reason would seem to rule otherwise. The distribution pattern for new equipment has been uneven and in some cases the development and production of new models overtook the gradual issue of previous models. Soviet military leaders have spoken of the heavy cost of furnishing modern equipment to the ground

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forces and said not all units would receive the latest models.

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The Panel believes that all active units regardless of their manning levels have land combat equipment in quantities adequate for their training and commitment to combat. Very few if any are completely equipped with the latest models and some are almost certainly equipped wholly with older models. The Soviets have planned to mobilize additional forces, if need be, by splitting the cadres of existing units to form new ones and to call reserve personnel into active service. It is uncertain how many additional divisions and supporting units could be equipped. Doctrinal and technical developments and continuing budgetary stringencies may have prompted a reconsideration of mobilization plans with a resultant change in the stocks of equipment.

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I. Nature of the Evidence

The evidence available for the assessment of the levels of output or of the inventory of Soviet land armaments originates, with one exception, from those types of sources that have been discussed in the Panel's first interim report:

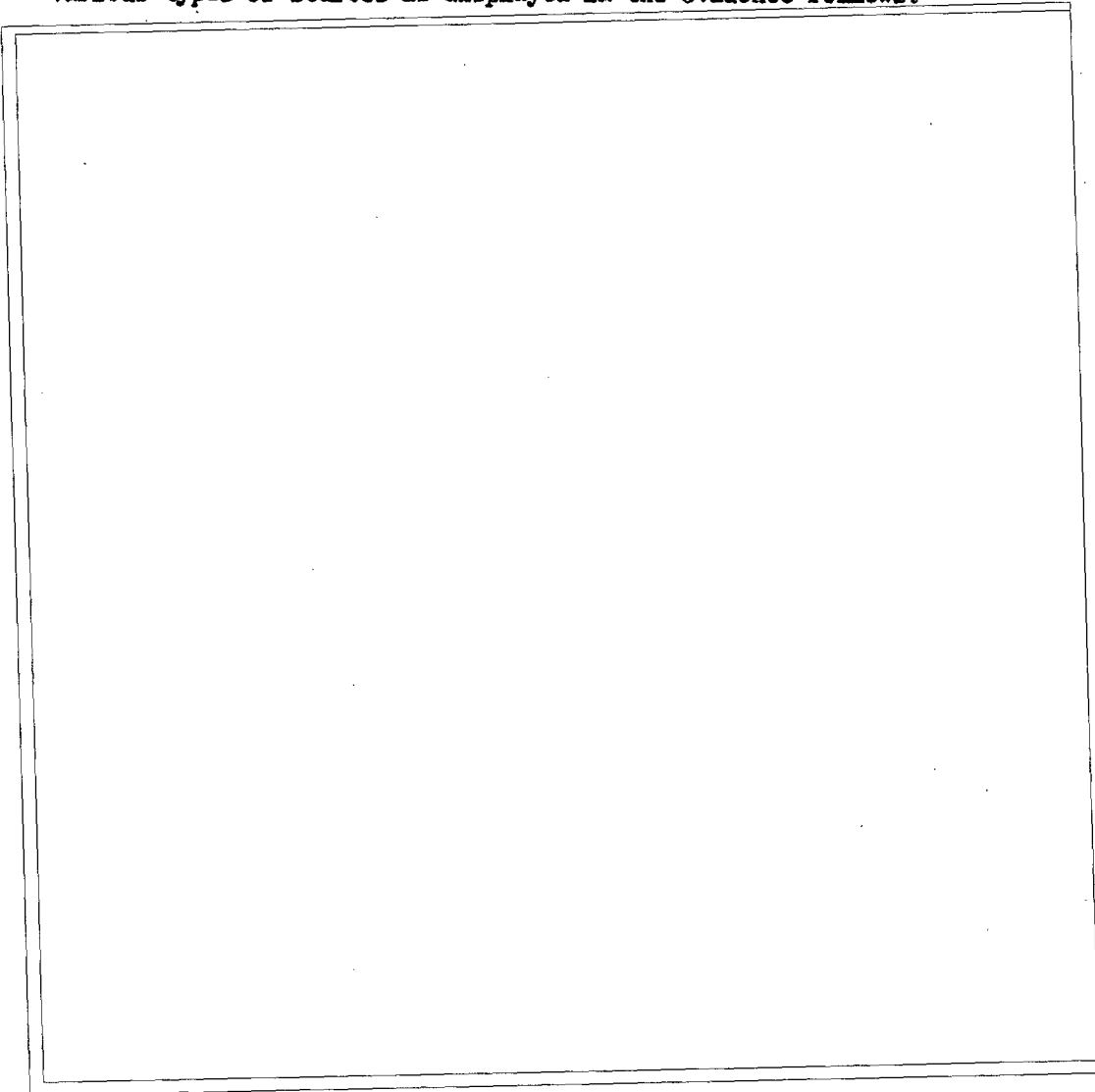
The collective output from these sources has proved disappointing in quantity, timeliness and comprehensiveness. In addition none of the sources has provided consistent coverage over the period since World War II. This situation is not surprising in view of the nature of the problem.

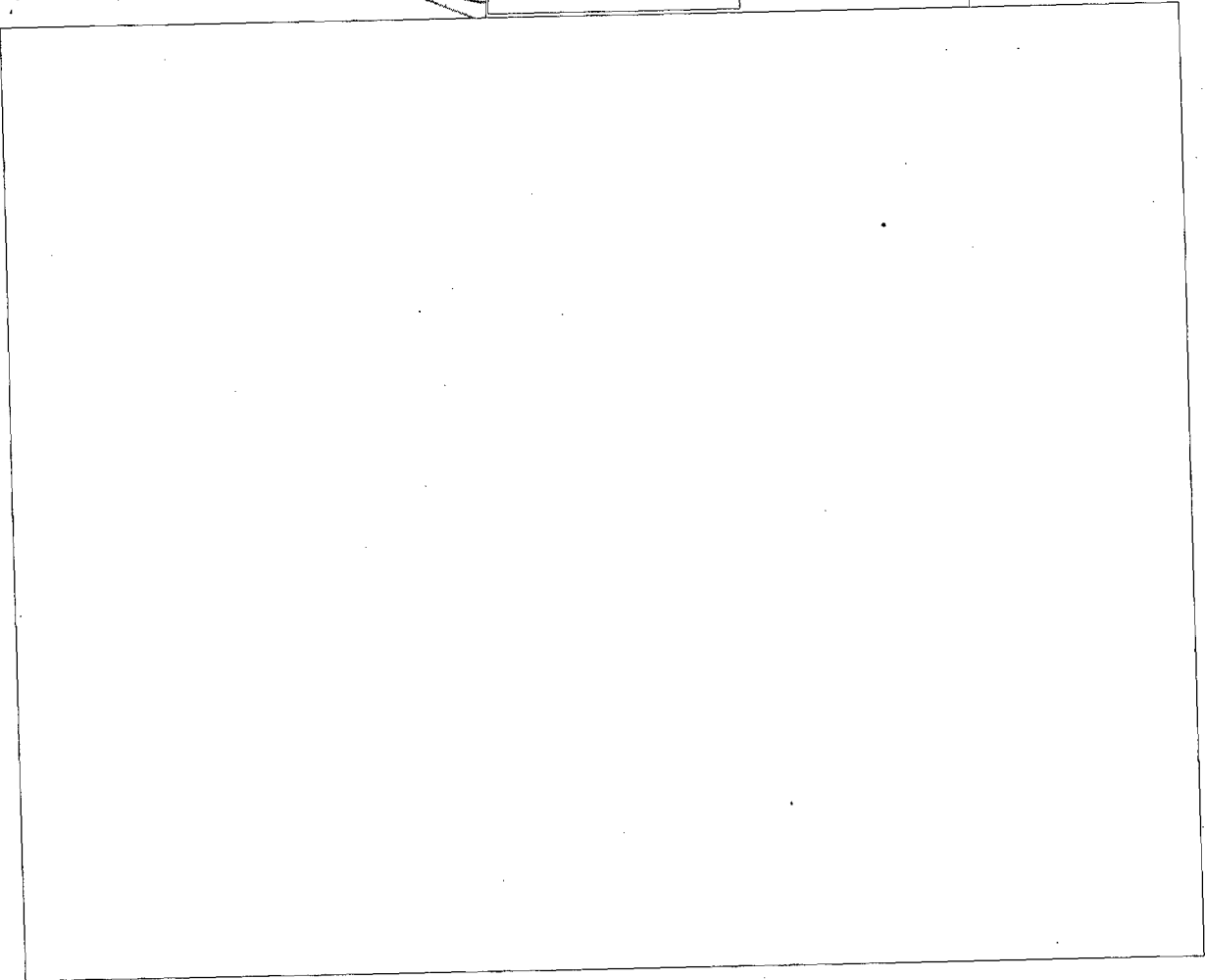
Land combat equipment and ammunition represent a wide variety of comparatively small items. Production can be dispersed widely in a number of different types of plants often indistinguishable from non-military installations. Storage can be accomplished in a variety of ways with little difficulty. Deployment can be made with little risk of observation. Introduction into units can be made piecemeal without readily recognizable changes in support arrangements or in tactical employment. Different models may appear identical to all but trained observers.

In addition to collection problems inherent in the nature of the materiel, the Panel found that the comparatively low priority enjoyed by land combat equipment in the order of collection objectives and in

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estimates of Soviet capabilities also influenced the flow of information. Recent interest in the problem has raised priorities and collection efforts, but considerable time is required to generate an increased flow of information on a subject as diffuse as land armaments and ammunition. A brief summary of the capabilities of the various types of sources as displayed in the evidence follows.





B. Soviet Documents

Classified and unclassified Soviet Documents have been obtained which contain generalized references to the supply of equipment and to economic limitations on procurement but none have been of value in assessing the quantities of items programmed, produced or maintained in inventory. The Soviets apparently do not freely disseminate such information even in classified documents. For example, the captured Secret version of the 1940 economic plan which fills some 750 pages included only two statements



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that are even superficially relevant to the question of the combined value of output of the then four People's Commissariats of Shipbuilding, Aviation, armaments and Munitions. Nor has the exploitation of the high level discussions in the classified IRONBARK series resulted in so much as a suggestion of the aggregate level of output for any item of major Soviet military equipment.

[redacted]

D. Overhead Photography

[redacted] photography is a principal source of information on the equipment held by the GSFG but is restricted to those areas beneath the air corridors [redacted] Thus, only a limited portion of the GSFG is covered, and the Soviets are conscious that it is being covered.

TALENT photography was not targeted against installations of importance to this problem and provided only a very limited amount of

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coverage of facilities where land combat equipment was produced, stored or used. Its value will be primarily in comparative analysis with KH-7 photography.

KH-4 photography is providing an excellent overall base for study of ground force problems, but requires supplementation by KH-7 before an important contribution can be made relative to equipment and ammunition. KH-7 photography offers the single best hope for an important breakthrough on overall inventories of equipment although the average resolution now provided does not allow differentiation between models and only limited differentiation between types of equipment. The increasing coverage of plants and military installations however should go far in describing the gross capabilities of the Soviets in production and storage of equipment and ammunition, and further, be revealing of inventory patterns in relation to major line units.

II. Assessment of the Evidence

After observing the absence of evidence applicable to the direct determination of inventories, the Panel proceeded perforce along very basic lines in its assessment.

A. The Direct Establishment of National Inventories

The Panel has found that at least since World War II no source has provided any direct appreciation of the overall inventory of Soviet land combat equipment and ammunition, even for a single point in time. Further, the number of combat units which have comprised Soviet mobilization goals and for which equipment and ammunition were stocked is unknown. Nor has there been any indication of the planned goals for production or for the numbers of active units to be outfitted with new pieces of equipment. In short, there is no information which is directly applicable to the statement of the probable Soviet inventories in aggregate terms.

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The one recent indication of the composition of the inventory was given by Minister of Defense Malinovsky in a pamphlet issued in 1962. He stated that commanders who might be expecting that all of their equipment would be of the newest models (before seeking to eliminate all shortcomings in battle readiness) were waiting in vain. He went on to state that some units will always have obsolescent equipment because production will never satisfy demands completely. He inferred that rapid developments in weapon technology make the complete equipping of troops with new models uneconomical because more advanced models follow so rapidly.

Unfortunately, Malinovsky was not enlightening as to the criteria used for determining new equipment inventories or reserve inventories for mobilization or war losses. Writings in the IRONBARK series did indicate that policies relative to inventory levels were being re-examined. Colonel General Malykhin wrote that arguments were in process (in 1960) concerning the size and order of echeloning of stocks created in peacetime. Marshal Rotmistrov in reference to suggestions to saturate motorized rifle divisions with tanks said that saturation of all divisions with tanks was impossible for the economy of the country to support. Colonel General Snanov said mass introduction of new types of armament and combat equipment has always come up against a country's economic potential and this alone dictates a gradual change while old types of equipment are retained.

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B. The Existence of Items and the Probability of Quantity Production

1. The Existence of Items

The Panel is satisfied that with the exception of very new items the types and models of land combat equipment and ammunition comprising the Soviet inventories since World War II have been identified by the available sources. However, the Panel has found that early discovery and identification of a new item of land armament or ammunition is a continuing problem. Because of Soviet security precautions, Western intelligence usually has not been aware of the existence of an item until the Soviets are ready to expose it. The production of ground force materiel has not generated the types of intelligence information [redacted] [redacted] which have been associated with the production of ships and aircraft. First identification of new weapons and equipment has been made most often through visual sightings. Although the Soviets have shown a number of new items in Moscow parades, sometimes they have not, and the first indication of an item's existence occurs only after it has been deployed with the Soviet groups of forces in Eastern Europe. Detection of developments in ammunition is even more difficult because the Soviets do not expose pieces of ammunition for Western inspections.

The outstanding recent exception to the situation outlined above for both equipment and ammunition was Malinovsky's description in IRONBARK documents of the T-62 tank, its gun, and ammunition. Even this information was acquired while Western intelligence was still debating the existence of the older T-55 tank. Malinovsky stated that the T-62 became

available in 1961. Although seen in East Germany in 1963, no T-62's were sighted in the USSR until late 1964.

2. The Probability of Quantity Production

Information on current activities of Soviet land armament production facilities is such that quantity production of an item of equipment must be inferred from other information -- most often its sighting is the possession of regular field troops. While new equipment displayed in Moscow parades customarily proves later to have been adopted as standard issue, no clue to the status of development or deployment of the equipment normally has been available at the time of the parade.

The field troops most frequently observed and often the only ones seen in possession of a new item of equipment are those in Eastern Europe. The information is not sufficient to determine, however, at what stage of the deployment program these troops normally receive a new weapon or, whether they consistently receive their materiel early or late in the deployment cycle. A similar lack of knowledge exists relative to the distribution of materiel within the USSR. The evidence does show that new equipment flows gradually into the forces in Eastern Europe. Troops units are equipped piecemeal with new items and years may elapse before a new item has completely replaced the old. Thus, although it eventually may become clear that more than token production has taken place, the timing and the rate of production cannot be inferred from data on deployment patterns.

C. Assessment of Cumulative Production

Analyses of the Soviet capabilities to produce land armaments and ammunition, past production patterns, known distribution of some of the items produced, and apparent length of production runs for specific items permits only an approximation of annual and cumulative production quantities within quite broad confidence limits. Insight as to a likely minimum is only suggested by [REDACTED] counts of equipment which can be seen. The Panel finds that while calculations can be made as to the cumulative production of an item, no particular claim can be made for the results of such a calculation other than its being one of a very large number of widely different and equally likely possibilities, all of which may be consistent with the limited evidence available.

1. Capabilities and Requirements

a. Production Organization and Facilities

Since the end of World War II, the organizations managing production of land combat equipment and ammunition have changed several times. At the end of World War II, Armaments and Munitions were separate ministries. In 1953, the Ministry of Armaments was combined with the Ministry of Aviation into the Ministry of Defense Industry. In 1954, Aviation became a separate ministry once again. In 1957 the Ministry of Defense Industry was combined with the Ministry of General Machine Building into the State Committee on Defense Technology which organization continued into 1965. In 1946, the Ministry of Munitions was incorporated

[redacted]

into the Ministry of Agricultural Machine Building, in 1952 into the Ministry of Machine Building, in 1954 into the Ministry of Automobile, Tractor and Agricultural Machine Building. Subordination after the general reorganizations of 1957 is uncertain, but most likely, responsibility for ammunition was placed under the State Committee for Defense Technology along with responsibility for land armaments. In March, 1965, the state committees associated with defense production were reorganized into USSR ministries, one of which is the Ministry of Defense Industry. It is likely that this ministry has resumed control of those plants subordinate to the pre-1957 Ministry of Defense Industry. A Ministry of General Machine Building has been reconstituted also. Its area of responsibility is uncertain. In none of the organizational patterns noted above have primary production facilities been known to have been subordinate to the Ministry of Defense.

Design and development of material may be handled either jointly or separately by the responsible military arms or service and by the design institutes and plant design bureaus. Designs are allocated to plants for the production of prototypes with the developmental work and testing of the prototypes under the supervision of military representatives. General direction and final decisions on all major programs are given by the highest government officials.

This apparatus has available to it a large, well equipped industrial base for the production of conventional armaments -- seven plants have been identified as producers of armored vehicles; nine

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for artillery; seven for small arms, and 57 for ammunition.

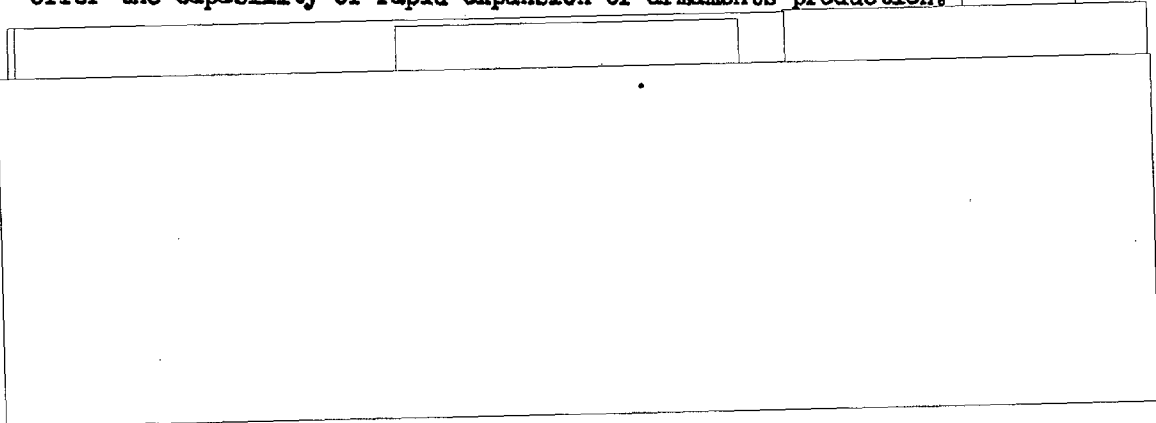
It is believed that the plants producing armaments are among the most efficient in Soviet industry having first call on new production equipment and skilled labor. According to Western technical analysts, Soviet designers have achieved an enviable record in development of simple, rugged land armaments which do the jobs for which they are designed with a minimum of weight and complex mechanisms. The record achieved by the Soviets in the design and production of land armaments during World War II borders on the incredible. This record should be taken into account in any assessment of Soviet capabilities in non-nuclear war. Soviet industry probably still has the capability to increase its production of land combat equipment and ammunition very rapidly and add significant quantities of these items to the existing inventory within a period of months.

Information on production facilities and their operations for the period 1946-53 was received in large quantities [REDACTED]

[REDACTED] Information received since the early 1950's has little more than confirmed the probability of continued production of some items and provided some small insight into the direction and scope of present activities [REDACTED]

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Most of the plants which produce land armaments also produce civilian goods such as tractors, railway equipment and machinery, and have industrial machinery. Because much of the equipment used to produce the civilian goods also is suitable for armaments, these plants offer the capability of rapid expansion of armaments production.



That evidence which is available on production policies indicates that the Soviets prefer rather long production runs of fairly constant level. Analysts believe that a period of five to ten years usually is used to schedule the production cycle for a major equipment model. The Soviets appear to prefer to make periodic major modifications on items in production rather than to re-design them completely.

Analysts believe that in most cases information is adequate ultimately to fix the date of initial quantity production to within one to two years of the actual date, and to fix the date of the end of production to within two or three years of actual termination. Some considerable time may elapse, however, before the evidence permits fixing limits with even the indicated precision. Often, the cessation of production of a given item only may be inferred from the identification of



an item which appears to be a replacement.

b. Program Requirements for Production of Equipment

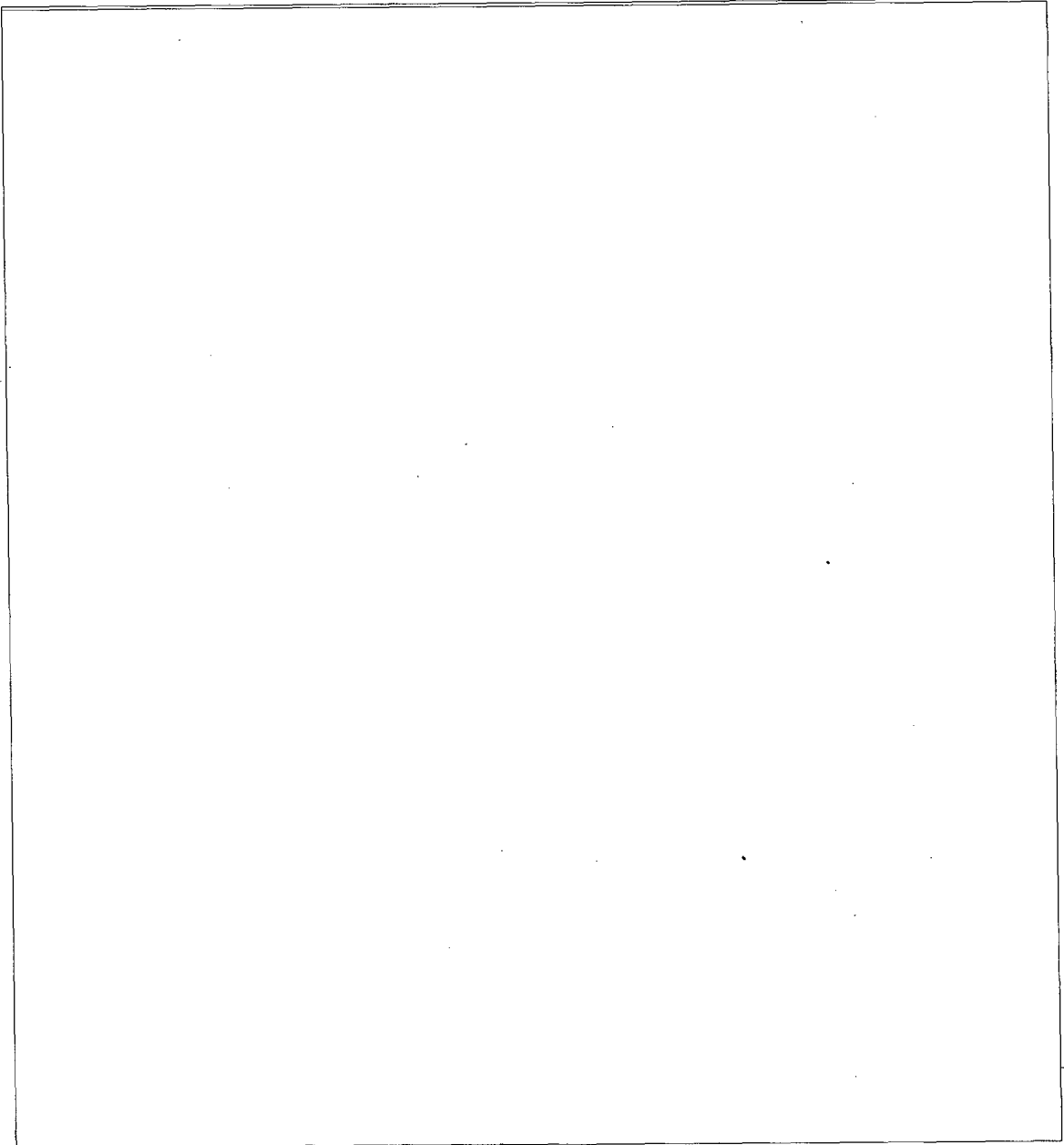
Little is known about how the Soviets program production of land armaments and ammunition. Available information has yielded no evidence as to the level of new equipment generally programmed for the active field forces or reserves, the size of the inventory required to keep a given quantity operational, or whether Bloc and non-Bloc military trade requirements are included. Response in the production programs to changes in force levels, force composition and units' tables of equipment is unknown.

Malinovsky has told his officers that not all would receive any given item of new equipment but it is uncertain how his statement relates to the issuance of new equipment to the various strength categories of divisions or combat support units. How the ground forces fare in competition with other forces which also may use the same model of equipment is not known. Air defense forces received some models of antiaircraft guns before the ground forces. Both Bloc and non-Bloc forces also have appeared with some Soviet equipment before the Soviet groups of forces were fully equipped with the same items. It would be expected that normally as first-line ground force units are re-equipped with new items, displaced items in good condition move back through the forces and perhaps eventually to the mobilization reserves. If this is the typical practice, reserve units are probably to be equipped almost wholly with obsolescent or obsolete items. It is possible also that some new material

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is placed in reserve to provide for replacement of early combat losses. As yet, however, there is no confirmation of long-term storage by the Soviets of new land combat equipment.

2. Establishing Minimum Production



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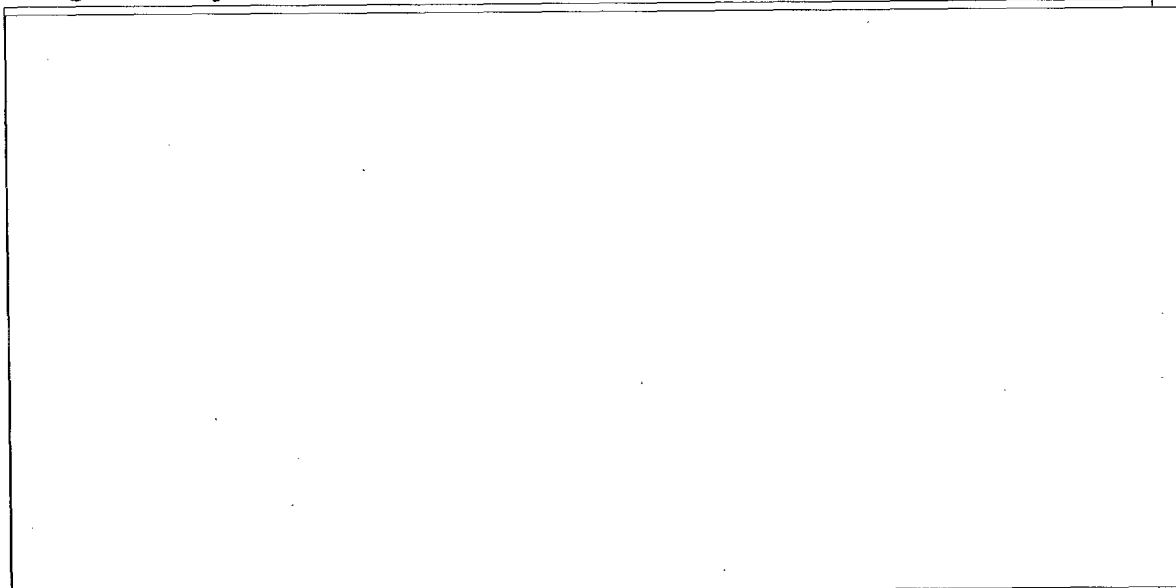
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b. Equipment in Hands of Troops

The Panel has surveyed the possibility of identifying quantities of equipment in the hands of troops to gain an appreciation of minimum production and inventories of equipment. The information available on all troop areas except East Germany was clearly inadequate for the purpose. While the information on Soviet units in East Germany greatly exceeds that from other areas, it was found to be severely restricted in scope and failed to prove generally rewarding for establishing minimum production.



On the basis of the information that is available, the troops of the Group of Soviet Forces, Germany (GSFG) seem to have no notable deficiencies in equipment. In some instances, however, models which are known to have been in production for years have not completely replaced earlier models. The outstanding example is the medium tank. As shown in

Table 1, in 1962 some 900 T-34 tanks were estimated to be still in troop units although production ceased in the 1940's and a second generation successor, the T-55 was present in some units in East Germany. The presence of only 340 PT-76 tanks could be attributed to the GSFG in 1962 although the TOE requirements were believed to be 480 and the tank had been in production 12 years. Only 200 BTR-50p APCs could be identified despite the estimated TOE requirement of more than 3,000 and the fact that production started in 1954. About half of the expected number of BTR-40 APC's was estimated to be in East Germany although production started in 1950. The validity of the figures shown in Table 1 are subject to ranges of error believed to be as wide as 10 to 40 percent, and no definite correlation between supply to GSFG and production can be established.

Information [REDACTED]

indicates that new ground combat materiel is sent to the GSFG initially in small numbers and is used for demonstration, familiarization, and initial training at large-unit headquarters. Some field testing also may be accomplished in the GSFG.* Subsequently, additional shipments are used for re-equipment on a unit by unit basis within priorities based on types of units and location. [REDACTED] new equipment is not issued to troops near the border. If the policy were applied to all areas where Western observation is likely, a part of the GSFG

* It is possible that some of the items first identified by sighting in the GSFG may be in this category. If so, the type of testing done is likely to be of a final nature immediately before large-scale series production. Unfortunately the evidence is too sparse to confirm early sightings of small numbers of an item as a guide to the initiation of series production.

Table 1

Quantities of Selected Items Estimated
For Troop Units, GSFC, 1962

	<u>Quantity Required by Estimated TOE's of Divisional Force 1962</u>	<u>Quantity Estimated To Be in Hands of Troops 1962a/</u>	<u>Quantity Confirmed by Count of Imports 1954-62b/</u>
Light Tanks PT-76	480	340	120
Medium Tanks T-34	4190	900	-
T-4/55		3790	4240
Heavy Tanks IS-2/3	950	770	-
T-30		200	280
Armored Personnel Carriers			
APR-40	1070	560	510
APR-152	2380	3240	1040
APR-50p	3020	200	290
Other			
160mm Mortar	180	180	340
100mm Gun	240	-	110
85mm Gun		240	-
57mm AA, S-60	540	720	80
ZSU-57-2 SPAA	240	160	340

a/ Estimates based on the equipment counts of sample units

b/ Counts of imports by model are available for the years 1954-63. Coverage over the period is variable with an estimated 80 percent coverage for the years 1954-60 and 40 percent for the years 1961-63. Some equipment imported may have been subsequently returned to the USSR or turned over to the East German army as well as being subject to normal attrition.

could be re-equipped with an item not known by Western observers to exist.

Inspection of the general pattern of equipment imports into GSFG during the years 1954-64 does lead to the conclusion that for whatever reason, the supplying of new equipment is indeed a gradual process regardless of when production started or the rates of production believed to obtain. Information on areas other than the GSFG is not adequate to confirm this as a general procedure. Another curious aspect of this situation is that some models of equipment have been exported in quantity to other countries, both Bloc and non-Bloc, before the GSFG was fully re-equipped. This raises a question of the relative priority of the GSFG for new equipment which the Panel has not been able to resolve.

The evidence from East Germany, supported also by evidence from other areas, has shown that the Soviets follow practices in the use of equipment which are intended to maximize its combat life. Some of these practices are questionable by Western standards. The Soviets place very limited annual norms on the use of most combat equipment, particularly vehicles. Daily training is accomplished through the use of either a small part of the regular unit inventory or with surplus older equipment retained solely for training. The remainder of the line inventory is kept in unit storage where the vehicles, although fueled and combat loaded, are kept on blocks. The tanks in unit storage are actually segregated in a separately secured areas. Although it receives regular attention from the crews which would operate it in combat, the

equipment in unit storage is used only during large scale unit exercises. In Western experience, deterioration of equipment is not necessarily a function of the days used or miles travelled. In addition, crew competence is related to the use and familiarity with the piece of equipment to which the crew is assigned. The Panel cannot judge the degree to which the Soviets have overcome these negative aspects of the storage of unit equipment, but the Soviets do manage to keep the equipment in East Germany in operable condition without notably high failure rates in road marches. Also, older equipment has been shipped to non-Bloc countries on very short notice without unusual complaints about the state of maintenance from buyers.

c. Other Approaches

In view of the inadequacy of the available information for basing estimates of inventories on direct evidence, calculations of cumulative production, or sightings of equipment, the Panel sought other approaches which might yield estimates with narrower ranges of certainty. Among the approaches examined was a reckoning of equipment levels from requirements indicated by the tables of organization and equipment (TOE) and order of battle (OB). It was found that in this approach, as with all others tried, that the lack of evidence forced resort to a number of assumptions such as those on production scheduling and replacement policy which had a critical influence on the inventories calculated. Changes in these basic assumptions, permissible within limits established by the evidence, could result in widely varying inventories. Thus no approach examined improved the situation so far as yielding inventories which

could be claimed to be more solidly based on evidence. Inventories could be calculated which seemed to have improved internal consistency as between types and models of equipment. The Panel cannot be sure, however, that the Soviets have followed production and inventory policies which are both consistent and reasonable by Western standards.

III. Findings

The Panel concludes from its review of the evidence on land combat equipment and ammunition that the evidence is adequate only for a general appreciation of the subject. In these terms, the evidence is useful for an understanding of the general dimensions of the Soviet effort to develop and produce modern equipment for its ground forces and the degrees of emphasis placed on various types and models of equipment. Even in these respects however the situation with respect to the coverage and currency of the information received is similar to other aspects of the Soviet ground forces - our state of knowledge lags some two to three years behind the current period and is restricted in scope. Thus at any given time, the Soviets could offer a surprise with a piece of equipment as they did when first employing the T-34 tank during World War II. Ordinarily display in a parade is the most likely means of first observation.

The evidence reviewed by the Panel has proved unsatisfactory for quantifying the production and inventory of land combat equipment and ammunition within useful confidence limits. Crucial elements are missing from the available evidence forcing the use of assumptions in estimating procedures. The reasonable variations in assumptions permitted by the

[redacted]

evidence can cause large differences in the sizes of inventories calculated. The Panel examined various approaches to estimates but found none which would reduce the very wide ranges of uncertainty. Thus, the Panel feels that with the exception of a few items, formulation of estimates of production and inventory by the Panel at this time would be misleading and would be a disservice because such estimates could not be justified by the evidence at hand.

The failure of the evidence to support useful quantitative estimates does not mean however that the Soviets have found to have neglected development and production of new land combat equipment and ammunition. The uncertainties are relative to the Soviet inventory objectives, rates of production and replacement, and disposition and extent of the inventory. In the Panel's opinion there is no doubt that the Soviets have had an extensive, continuing program for the design, development and production of land combat equipment and ammunition since World War II. As many as 80 models may have been in production at some time or other during the period 1946-1963 and there is firm evidence relating to about 60 of these models of equipment. By major category, these models are as follows:

<u>Category</u>	<u>Number of Models</u>
Armored vehicles	15 or 16
Field Artillery	15
AA Artillery	3
Mortars	3
Rocket Launchers	6
Missile Launchers (FROG)	2
Small Arms and Infantry Weapons	11
Tracked Prime Movers and Amphibians	4

[redacted]

Of the above items, 10 (excluding small arms) probably entered production in the period 1955-63. Appendix B presents in summary form the sources of information and the indicated dates of production for each item. Fourteen types of ammunition have been identified by observation or from Soviet documentary sources. Most of the weapons shown in the table required ammunition of a new caliber or of a configuration different from that previously manufactured.

Although the materiel appears to reach the troops in a gradual flow and some troops elements may never have the latest models, no troop units on which there is direct information have been noted to have significant materiel deficiencies when measured by the estimated TOE's. The Panel believes it probable that all active units, including cadre units, have sufficient combat materiel to fill out their TOE's, although it cannot judge the proportion of current models.

Resolution of the problems of quantification of the inventory by type and model cannot be foreseen based on the types of information to be expected [redacted]

[redacted]

[redacted] The plants known to produce land combat equipment can be observed for signs of activity and possible verification of continued military production. [redacted]

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