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Prospects for the Development of the
Air Forces Rear Services
by
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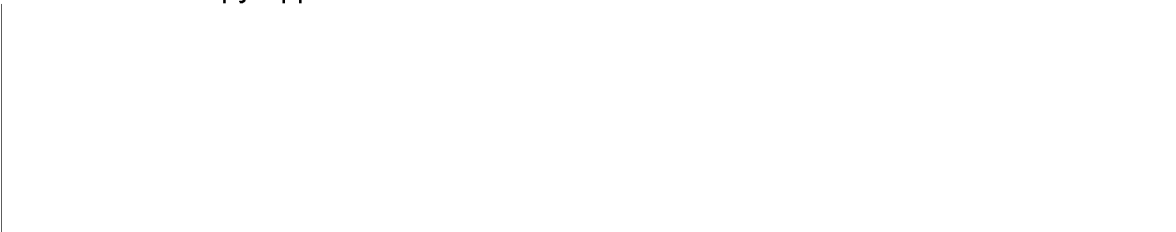
The organization of the rear services, their technical equipping, and the methods of rear services support of air large units and units are continually developing and improving simultaneously with the progress in military art, armament and the combat employment of aviation.

The presently existing system of organizing the rear services and the support of aviation combat actions by the rear services during operations basically corresponds to the requirements being levied. However, there are still a number of unresolved problems. The questions of the preparation of the necessary number of airfields during an operation, the movement of the forces and means of aviation technical units to them, and the organization of the delivery of materiel should, in our opinion, be included among the most urgent problems. As is known, all of this is extremely important for the support of a well-timed maneuver and of the combat actions of front aviation under conditions of a high rate of advance by the ground troops and the widespread employment of weapons of mass destruction.

The requirements of modern aircraft in respect to the size and surface quality of landing strips are very great. For example, fighter aircraft require airfields of the second class with a runway up to 2,200 meters long, but the newest systems of fighter-bombers need airfields of the first class with a runway up to 2,500 meters long. The average volume of earthwork during the preparation of a dirt airfield of the second class is 15 to 20 thousand cubic meters. The construction of such an airfield is a complicated engineer task. An airfield engineer battalion, manned and equipped according to its wartime T/O & E, spends two to 2.5 days on the preparation of a dirt airfield for front aviation. With such an expenditure of time, the rebasing of front aviation, whose aircraft have a relatively short tactical range, will inevitably lag behind the advancing ground troops.

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Airfield engineer support of aviation basing is further complicated by the fact that modern aircraft have relatively low ground flotation on dirt landing strips and hardening the ground of the runways currently is very



difficult.

The problem of airfield engineer support is presently being resolved in three main directions:

- by developing new types of aircraft with improved take-off and landing characteristics;
- by increasing the maneuverability and performance of airfield engineer units by means of equipping them with more modern engineer equipment;
- by researching methods to stabilize the ground with the use of chemical additives.

The successful completion of all of these measures will permit the preparation of the necessary number of airfields during offensive operations to be considerably expedited.

But it is necessary to bear in mind that not only airfields are required for support of the timely dispersal and maneuvering of air large units and units. The fact is that air units will not be able to execute combat flights from airfields which do not have all the necessary forces and means for support, fuel, ammunition and other materiel.

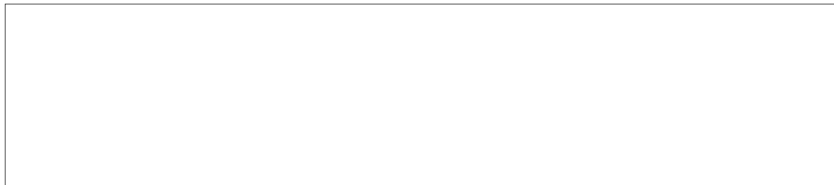
In contrast to the past war, the rebasing of air large units and units during an offensive by the ground troops will now occur more frequently. Research shows that it is necessary to rebase up to 40 to 50 percent of fighter and fighter-bomber aviation units every day. In view of this, we consider it essential to equip aviation technical units so that they can relocate to a new airfield by means of one trip by organic motor transport.

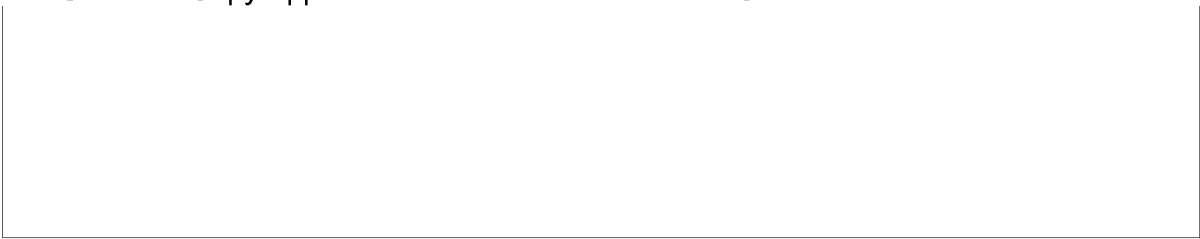
The task of improving the transportability of the authorized equipment being hauled and of introducing trailers and vehicles with a heavy load capacity and a high cross-country capability is being carried out by the Air Forces command to increase the mobility of aviation technical units.

It is necessary to state that we have serious complaints against aviation designers who until now when developing new models of aircraft have given insufficient attention to the convenience of servicing, and to the standardization of separate aircraft components and structural elements.

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The lack of standardization of a number of operating elements on various types of aircraft has led to an almost tenfold increase in the quantity of tools, benches and equipment units required for the preparation





of aircraft for flight, which restricts the maneuvering capabilities of air large units and units.

For the present, all ground equipment for aircraft is very bulky and non-transportable.

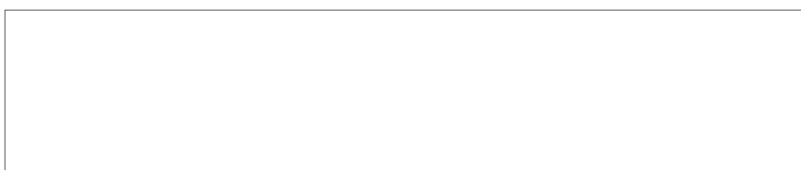
Such, as it would seem, an elementary question as the standardization of the plug and socket units of aircraft with ground means has not even been resolved. For example, nine kinds of adapters are employed when a mobile generating set is used during the maintenance of various types of aircraft, and different connections are necessary when joining with the hydraulic system.

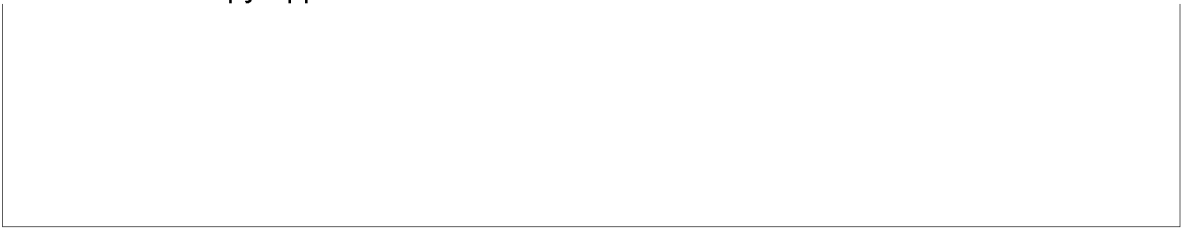
In all 40 to 70 four-ton trucks are necessary for the transport of the ground echelon of modern fighter-bomber aviation regiments, while even according to wartime T/O & E there are fewer trucks of various types in a separate airfield technical support battalion. Clearly, when a regiment together with a separate airfield technical support battalion is rebased to a new airfield, it is necessary to make several trips.

In connection with this, a reduction in the volume of hauling for the ground echelons of air regiments, along with an increase in the cargo capacity and cross-country capability of the organic motor transport of aviation technical units and in the transportability of their authorized equipment, is now extremely important. The main method of resolving this problem, in our opinion, is to develop standardized, transportable ground equipment for aircraft and to provide for hauling the ground echelon of an air regiment by air transport. It is necessary to keep in mind that in a number of cases it will simply be impossible, because of the destruction of ground transportation lines, to deliver aviation technical units and reserves of materiel to new airfields by motor transport on time. Realistically appraising the capabilities of transport aviation, the use of which for the transport of rear services units and materiel is now limited, we think the time has come to consider the issue of the establishment of special transport aviation units of central subordination and of front air armies in wartime; the Air Forces rear services and the rear services of the air armies would plan the use of these units.

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The dependence of progress in the organizational forms and technical equipping of the aviation rear services on the level of development of aircraft is completely natural. However, this, like every other conformity





to a law of public life, does not appear spontaneously. It results from the purposeful activity of people engaged in the building of the Armed Forces. For this reason, the timely and correct appraisal of the changes occurring in aircraft, and the well-timed carrying out of measures for the improvement of the organizational structure and technical equipping of the rear services in accordance with realistic requirements, have extremely great significance.

This thesis is convincingly corroborated by past experience. For example, the high maneuverability of aviation caused by the characteristics of its equipment was also known at the outset of its development. Long before the beginning of World War II it was also evident that unwieldy air bases, which were a part of air large units, reduce the maneuverability of aviation. However, the decision to establish independent airfield servicing battalions and aviation basing areas was reached only on the eve of the war. As a result, it was necessary to carry out a fundamental reorganization of the rear services under the difficult conditions of the initial period of the war, which seriously interfered with the complete utilization of the combat capabilities of aviation.

Precisely for this reason the advance and thorough research of questions on the further development of aviation rear services as regards the outlook for the development of aircraft in the next 10 to 15 years is presently acquiring great significance. This will permit a better execution of the task of rear services support for future aviation.

Taking into consideration the complexity of the problem of preparing airfields during modern operations, aviation designers now are industriously working on the development of new types of aircraft having high ground flotation on dirt and short take-off and landing runs. Along with the general tendency to resolve this problem by means of various design improvements (the use of wheel-and-ski landing gear, reverse thrust, swing wings, etc.), a new trend in the evolution of aviation, the development of vertical take-off and landing aircraft, is becoming widespread.

There is no doubt that the appearance of short and vertical take-off and landing aircraft will cause fundamental changes in the organization of rear services support for air units. First of all, the construction of large airfields and very hard airfield surfaces for front and military transport aviation becomes no longer necessary.



Research shows that it is possible to rely on the development of combat aircraft which can be based at dirt airfields with landing strips 500 to 600 meters long and with a hardness of the ground which can withstand four to six kilograms per cubic centimeter. The volume of earthwork during the preparation of such an airfield is 500 to 1,000 cubic meters which is, therefore, 20 times less in comparison with the preparation of a dirt airfield of the second class. Thus, the search for parcels of terrain for such airfields is simplified to a considerable degree.

As regards vertical take-off and landing aircraft, sometimes such aviation is called "non-airfield" aviation, i. e., not requiring airfields. Actually, for the flight support of such types of aircraft, it is still necessary to prepare small dirt landing strips approximately 200 meters long since even these aircraft will take off only after a short run in a number of situations (when overloaded, when based at a high altitude, when the surrounding air is of increased temperature).

Thus, aircraft of any type require a certain parcel of terrain where they will be able to prepare for flight and to take off and land. Whether this parcel of terrain is called an airfield or a landing strip is essentially insignificant. A landing strip is also an airfield, but a small one.

It is essential to conduct planning and survey work and construction tasks during the preparation of such an airfield (landing strip) and aircraft parking areas. It is also necessary to clear the approaches, prepare intra-airfield roads and access routes, to camouflage, and to accomplish other tasks. One also ought to keep in mind that vertical take-off aircraft heavily damage the surface of the airfield with gas jet blasts from the engine. Consequently, special measures are necessary to assure the maintenance of the airfield in constant readiness for operation.

Concerning the introduction of short and vertical take-off and landing aircraft into the armed forces, it could be advantageous to resolve the question of the great extent of the dispersal of air large units and units and the problem of their extensive maneuvering in following the advancing troops. The time for preparing airfields (landing strips) for such aviation will be significantly reduced; therefore, it will be possible to prepare a sufficient number of them in a short period of time by using the forces and means available in the rear services of the air army.

An increase in the ground flotation of aircraft on dirt will bring a manifold reduction in the dependence of combat activity by air units on the time of year and on weather conditions.

A reduction in the volume of work connected with the construction of new airfields (landing strips) will permit the basing of front aviation much nearer to the troops during offensive operations, as a result of which the flight resource of fighters and fighter-bombers will be utilized for combat actions to a greater extent, and the depth of action by bomber aviation against enemy targets will increase.

However, it would be incorrect to maintain that a decrease in the requirements for airfields simplifies in direct proportion the task of the organization of aviation airfield support. The fact is that, with the greater dispersal of basing of air units, it is necessary to significantly increase the number of airfields (landing strips).

If the deployment of an air regiment at two airfields is now considered standard, then, after the introduction of new aircraft systems, each air squadron will apparently be deployed at one or two landing strips. Therefore, five or six landing strips must be prepared for an air regiment, and 15 to 18 for an air division.

The new requirements for the basing of aviation will necessitate a fundamental reorganization of the structure of our airfield engineer units. Presently an airfield engineer battalion consists of three specialized companies (according to wartime T/O & E). During the preparation of one large airfield, this permits organization of the work by the production-line method. If it is necessary to prepare several small airfields (landing strips) simultaneously, in our opinion the airfield engineer battalion must be composed of several multipurpose companies in order that each of them would be able to independently prepare a landing strip in the course of a 24-hour period.

A reduction in the need for hardness of the ground will also make possible the replacement of a number of types of bulky, heavy engineer equipment with lighter, mobile, and sufficiently high-performance equipment. And this in turn will increase the maneuverability of our airfield engineer units.

The wider dispersal of air units to a significant degree complicates the task of materiel, airfield technical and medical support. Primarily, the need is arising for aviation technical units which will be able to



support an air regiment at several (up to six) landing strips located dozens of kilometers apart. And at each of these landing strips, the aviation technical unit will be required to accomplish an entire complex of tasks: the quartering and feeding of personnel, the delivery of ground equipment, fuel, ammunition and other materiel to the aircraft, the maintenance of the landing field in constant readiness for operation, the providing of security, ground defense and camouflage for the airfield (landing strip), etc. Of course, the appropriate forces and means must be available at each airfield.

In our view, it is most advisable to have small, maneuverable subunits of airfield technical flight support available within an aviation technical unit in accordance with the number of groups of an air regiment's aircraft which are based at separate landing strips. This will permit the rapid forming and moving out of komendaturas for the support of air subunits at separate landing strips.

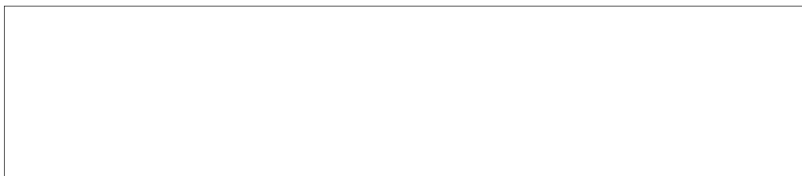
All of the main support services must be represented in the komendaturas. For this reason, each service must have the capability to allocate its representatives and essential technical means to all komendaturas. The structure of an aviation technical unit must contain a basic nucleus which provides control over the komendaturas, organizes the delivery of materiel to them, the repair of equipment, and other measures which are accomplished on a unit-wide basis.

The issue of the organization of control of forces and means of an aviation technical unit is more critical in view of the high degree of dispersal of an air regiment at several airfields (landing strips).

It appears to us that the existing regulations on the control of komendaturas and on the responsibility of the personnel in charge for their operation can also be basically retained in the future. At the same time it is necessary to keep in mind that the volume and nature of their work will vary considerably with changes in the number and composition of the komendaturas.

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It is necessary to achieve an organizational structure for the aviation technical unit which is conducive to the unit's autonomy of action in the main task areas. But in a number of matters the degree of autonomy of a komendatura will apparently be less than it is at present. For example, it is hardly advisable to maintain a complete range of supplies of personal and aviation technical equipment in every komendatura. Obviously, it is better to locate this materiel, and also the workshops, laundry and





medical point of the aviation technical unit and some other installations, at one of the airfields (landing strips) situated at the center of the regimental airfield complex. The main motor transport means for supply and a small reserve of supplies of fuel and ammunition, which could be urgently needed at other airfields (landing strips), also will be located here.

Such a procedure of deploying the forces and means of an aviation technical unit in the airfield complex of the air regiment being supported requires that the commander, staff and chiefs of the services more efficiently control the activity of the komendaturas, constantly monitor their status and capabilities, and assist them according to the tasks assigned and the developing situation.

The staff of an aviation technical unit must have reliable communications with the komendaturas in order to assure the timely transmission of instructions to them and the receipt of essential information from them. For economy it is advisable to more extensively use the communications of the air regiment staff with the air squadrons (groups) based at the corresponding airfields (landing strips). Along with this, the possibility of direct radio communications between the staff of an aviation technical unit and the subordinate komendaturas must also be kept in mind.

The justness of this requirement becomes especially clear, if one considers the great flow of information connected with the specifics of the operation of aviation technical units and the characteristics of their redeployment: they are deployed in new areas before the arrival of subunits of the air units.

The basing of aviation in small groups significantly complicates control of the activity of aviation technical units and the organization of the delivery of materiel to airfields (landing strips). In connection with this, it is also very important to examine the middle level of rear services -- the aviation technical large unit.

As is known, aviation technical divisions are designated in wartime for the materiel, airfield technical and medical support of two or three air divisions, i.e., six to nine air regiments. When each regiment is based at five or six landing strips, the staff of the aviation technical division is required to have information on the status of the supply of basic materiel at more than fifty landing strips, and to organize the delivery of materiel to each of them. Such a task will be extremely difficult under conditions of the highly maneuverable combat actions of





aviation.

At the same time, the commander of an air division, having made a decision for maneuver and combat actions by the subordinate air units and subunits, must know the extent to which they are supplied at each landing strip, and have the capability to influence decisions on matters of rear services support in a timely manner. Of course, with the existing organization of aviation technical divisions, these capabilities are limited.

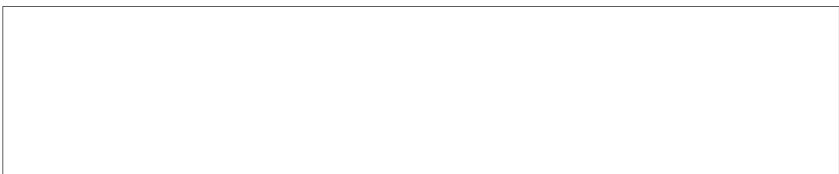
In connection with this, in our view, it appears more desirable to establish a rear services organ with materiel depots and with means of communications and transport for the support of one air division, in place of the aviation technical division which is relied upon for the support of two or three air divisions. Although for the present we will not decide upon a name for this organ, we will conditionally call it the "aviation technical brigade". The number of separate airfield technical support battalions within the brigade must correspond to the number of regiments in an air division.

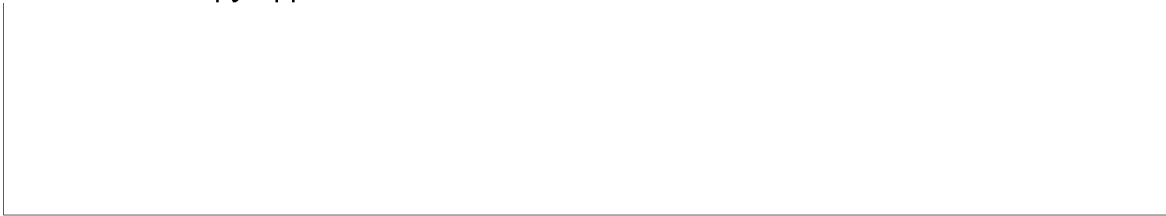
Brigade headquarters could consist of the command, staff, the basic supply services, the motor vehicle and tractor service, the electric-gas service, and the airfield operating service. The number of personnel at brigade headquarters will certainly be less than that at the headquarters of an aviation technical division.

The depots of a brigade will have a capacity two or three times smaller than the depots of an aviation technical division. This will enable them to become more mobile, which is especially important under modern conditions. At the same time, reserves of materiel at this level of the rear services will be closer to the airfields, since the basing area of one air division is considerably less than that of three divisions. Thus, the system for the organization of the delivery of materiel will become more reliable.

In order to increase its mobility, in our opinion, a brigade should not contain a hospital, and it is advisable to reorganize the mobile field hospitals of aviation technical divisions into mobile army medical detachments.

Thus, the new organizational structure of tactical aviation rear services will permit the more efficient accomplishment of matters of materiel and airfield technical support for the combat actions of units of





an air division under conditions of the units' dispersed basing and extensive maneuvering.

In evaluating the advisability of the reorganization of the rear services as discussed, one must also take into consideration the fact that this measure will make it possible for the system of control of the rear services in peacetime to approach that of wartime, which is also extremely important.

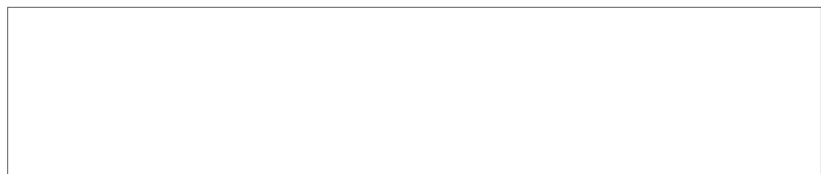
The fact is that in almost all air armies there are no aviation technical divisions during peacetime. With the declaration of mobilization, a certain time period is required for their establishment, and they, as the experience of exercises shows, actually cannot fulfil their functions during the first operation.

Of course, considerably less time will be expended on forming and organizing an aviation technical brigade based on the air division rear services presently available.

An air division deputy commander for the rear now actually controls the activity of the aviation technical units within the division, knows their status and capabilities, the level of training and the organizational abilities of the commanders and chiefs of the services. Thus, it is not necessary to substantially alter the existing system of control of aviation technical units during the reforming of the air division rear services into an aviation technical brigade.

In resolving questions of further improvement in airfield technical flight support means, the deficiencies which have existed up until now in this highly important matter cannot be tolerated. In connection with this, it is necessary to approach the issues of the development of support equipment differently.

While new types of aircraft are still in the planning stage, and beginning with the working out of tactical-technical requirements for them and their consideration by the model committee, it is, obviously, very important to clearly define the entire system of ground means required for the maintenance of the aircraft, to work out the tactical-technical requirements for the new means in a timely manner, and to assure that experimental models of them are produced simultaneously with experimental models of aircraft. Only with such an organization of experimental and design work will the development of airfield technical support means not lag behind the level of development of aircraft.





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The extensive maneuvering of air large units and units from one airfield to another and their basing at dirt airfields urgently require the development of standardized technical means having a high cross-country capability on dirt and usable for the support and maintenance of any type of aircraft and helicopter. This requirement is not only retained, but becomes especially critical when short and vertical take-off and landing aircraft are introduced into service.

In addition, the basing of small groups of aircraft at numerous landing strips necessitates a review of our attitude toward the combining in one specialized vehicle of several related aircraft servicing functions.

In its time the idea of developing combined means of airfield technical flight support was studied and rejected because of its high price and complexity of operation. Moreover, a substantial reduction in the number of vehicles allocated for flight support did not occur since one vehicle could not be operated for the simultaneous fulfilment of various functions.

As a result, improvement in means of airfield technical flight support proceeded along the line of specialization, which in turn inevitably led to an increase in the number of types of various specialized vehicles as aircraft developed.

Although recognizing the considerable deficiencies of combined specialized vehicles, it is still essential to study this question again based on the new conditions of the basing of air units.

Progress in science, technology and economics in our country has created the real possibility of the extensive introduction of electronic computer equipment into the armed forces. Experimental models of specialized computers have already been developed for the center and for operational formations. Research which has been conducted has established that all of the primary tasks of aviation rear services can be performed on these computers: the collection and processing of information about the status and capabilities of rear services organs, accounting and bookkeeping of all types, planning for the ordering, supply and delivery of materiel, and other tasks. Also, the flow of information concerning aviation technical equipment is enormous: up to 80,000 designations of different items of supply. In 1964, the Air Forces rear services received approximately three million requisitions for listed inventory items, during the processing of which 30 million bookkeeping operations were performed.

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For several years the rear services of the air forces have employed punchcard calculators for the planning of supply, the working out of the underlying calculations for the plans for orders, the processing of materials from inventory-taking and the compiling of comprehensive accounts on the separate types of equipment. In comparison with 1959, in 1965 the use of these means permitted a threefold increase in the volume of planning of the inventory list along with a significant reduction in the number of accountants.

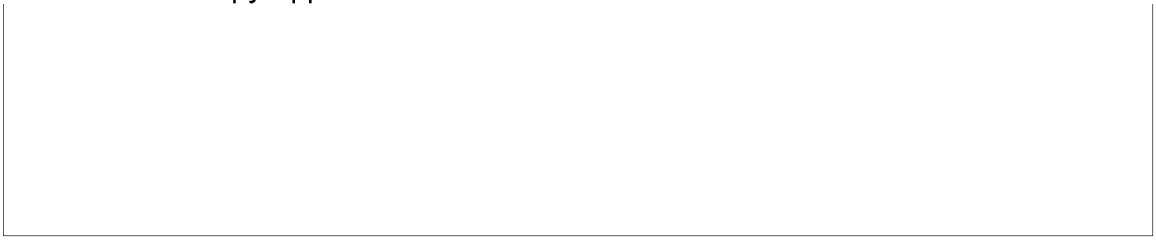
However, it is necessary to recognize that this is merely the first step in the replacement of manual labor by machines. While continuing the mechanization of the processes of accounting and planning of supply on the basis of punchcard calculators, it now is already necessary to set up rear services tasks for performance by specialized computers. This will enable us to more quickly and effectively utilize electronic computer equipment as it is received from industry.

In conclusion we shall mention that having matters of development of aviation rear services determined by the development of short and vertical take-off and landing aircraft, and also by the introduction of electronic computer equipment into the rear services system, is the prospect for the next 10 to 15 years.

While conducting necessary theoretical research which is directed toward preparation for the performance of tasks which are expected to arise in the near future, we must devote our attention, first and foremost, to today's problems:

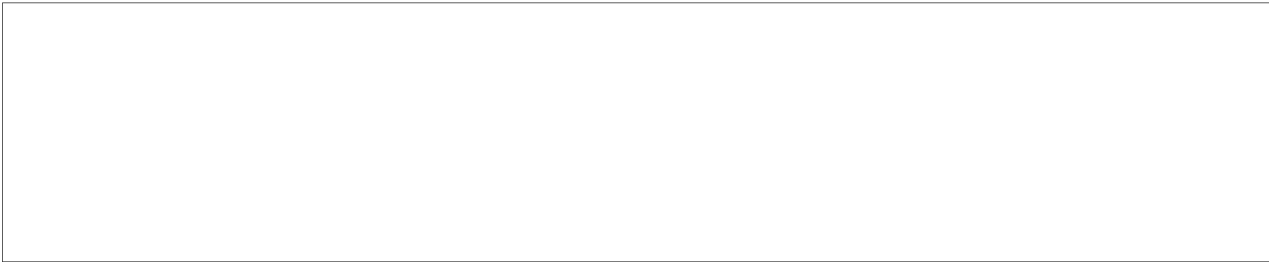
- to improve the organizational structure and technical equipping of rear services units while increasing their maneuverability and performance;
- to carry out all work necessary for better support of aviation at dirt airfields;
- to continue to improve the organization and methods for the high-speed construction of dirt airfields suitable for the flight of aircraft in service with the Air Forces;
- to increase the combat readiness of rear services units and facilities of the Air Forces in every possible way;
- while preparing the rear services to support the combat actions of aviation during a missile/nuclear war, to simultaneously provide the capability to support combat actions under conditions of the employment of conventional means of destruction.

The task of commanders and chiefs at all levels is to do everything possible to resolve the existing problems, and simultaneously with this to



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effectively work out the long-range questions of the future development of the aviation rear services.



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