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Next 3 Page(s) In Document Denied

The Capabilities of the Reconnaissance Forces and Means of a Front and Their Employment

by

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Integrated tactical-special exercises were conducted for reconnaissance, missile, missile technical and communications units in the Baltic Military District in 1965-1966, in order to study the capabilities of the reconnaissance forces and means of a front. The participants in these exercises were the intelligence directorate of the military district staff, the intelligence departments of the staffs of the combined-arms army and the air army, SPETSNAZ and OSNAZ large units and units, the control post of the military district chief of intelligence, operational and tactical air reconnaissance squadrons, separate reconnaissance battalions of divisions, and other reconnaissance subunits. Appropriate forces and means were used to represent the enemy.

We will examine the progress and results of researching the capabilities of the different types of reconnaissance in the exercises.

Aerial reconnaissance plays a major role. As a result of joint planning by the intelligence directorate of the front staff, the intelligence department of the air army staff and by the staff of the front rocket troops and artillery, a special plan-schedule of massed sorties of reconnaissance aviation to reconnoiter targets during the initial nuclear strike, was worked out in detail. This plan indicated the subunits and units allocated for reconnaissance; the targets, methods and time periods for conducting reconnaissance; the call signs of the crews, the time and addressees for transmission of reconnaissance data from on board the aircraft and from wet negatives; and also measures for combat support of a sortie of reconnaissance aviation. The plan-schedule was approved by the front commander. We think that only such joint planning can ensure the most effective employment of the means of aerial reconnaissance.

In the exercises, a massed sortie of operational and tactical reconnaissance aircraft was carried out at the beginning of combat actions. The reconnaissance aircraft flew at altitudes of 300 to 800 meters; search and detection of "enemy" missile/nuclear means, troops and equipment were carried out visually, followed by photography.

50X1-HUM

Based on the experience of the exercises, the range at which enemy missile/nuclear weapons can be detected when a reconnaissance aircraft flies at low altitudes, varies from one-two kilometers to three-four kilometers, depending on the terrain, meteorological conditions and the nature of the target. The limited range for detecting targets and the need to determine their coordinates accurately force the crews to make two to four passes over a 10 to 20 square kilometer reconnaissance area, and even more over wooded terrain. When the enemy has a strong air defense, it is not very likely that such a number of passes can be completed, and this may result in unwarranted high losses of reconnaissance aircraft.

In the exercises the crews prepared themselves thoroughly for the flight, used a map and other materials to study the reconnaissance area and the disposition of air defense means in the flight path and in the reconnaissance area, determined the area in which the missile/nuclear means probably were located and, in accordance with these data, worked out the most desirable pattern of passes. Errors averaged no more than 200 to 300 meters when the coordinates were determined visually.

In the intelligence directorate, in the staff of the rocket troops and artillery of the front, and in the formations and large units, receivers with monitor recording of the radio messages on magnetic tape were set up to receive aerial reconnaissance data directly from on board the aircraft. A radio-relay aircraft was used to ensure reconnaissance data were received from the reconnaissance aircraft in the ultra-shortwave band. The experience of the exercises showed that the organization of communications between the combined-arms command posts and the reconnaissance aircraft, and also the technical means by which they are carried out, do not fully meet present-day requirements. In the period of the massed sortie of reconnaissance aviation these communications hardly will be able to fulfil their tasks. Practice shows that reliable communications may be achieved with the condition that one radio channel is used by no more than 10 to 12 subscribers.

An attempt was made in the exercises to overcome these difficulties within the framework of existing capabilities. For this purpose a special schedule for the transmission of reconnaissance data by the crews was worked out, in which each crew was assigned a primary and alternate time for transmitting radio messages, based on the periods for conducting reconnaissance. However, such communications by time periods delay the transmission of data already obtained, which is absolutely intolerable. 50X1-HUM

The submission to the front command post of reconnaissance reports based on the results of interpreting the wet negatives from two or three

targets took an average of one to three hours. In this, the photographic laboratories required 12 to 15 minutes to interpret, determine coordinates and draft a coded message. The passage of the report via technical communications means through the air army command post was extremely slow due to the heavy load on the communications centers and frequently took several hours. As a result, the aerial reconnaissance data lost their value and could not be utilized.

The organization of reliable information reporting requires establishing direct communications lines, primarily cable lines, between the command posts of the reconnaissance aviation units and the front intelligence directorate, using high-speed equipment, and having an aerial reconnaissance data collection point attached to the front intelligence directorate.

Radio and radiotechnical reconnaissance. One of the main tasks of the exercises was to research the capabilities of radio direction finding, to test several theoretical propositions and calculations, and to study the capabilities and effectiveness of the direction-finding service while conducting radio reconnaissance of actual targets in the front zone. Since more improved technical means of secure troop control are constantly being introduced, and plain text radio traffic is being reduced to the minimum, radio direction finding is the only method in the radio reconnaissance system for establishing the areas in which radio sets -- and, consequently, the enemy staffs, command posts and other troop control organs -- are situated.

In the exercises the OSNAZ units deployed their radio direction-finding subunits in a line, with a distance of 45 to 60 kilometers between them. The targets of reconnaissance were field radio sets of no more than 200 watts power, operating in the two to three megahertz band and located throughout the direction-finding zone.

Analysis of the results of the direction finding of the radio sets shows that the accuracy of direction finding is affected by the distance to the sets and the frequencies on which they are operating. Direction finding of field radio sets with operating frequencies of two to three megahertz, located 70 to 80 kilometers away, can be carried out by surface radiowave with errors not exceeding plus or minus two to five degrees, but direction finding of those located in the zone 90 to 260 kilometers away hardly is feasible, especially at night, when errors increase to plus or minus 15 to 20 degrees.

50X1-HUM

In the zone 270 to 340 kilometers away the quality of radio direction finding by reflected beam improves mainly in the daytime (0500 to 1800 hours). If multiple bearings are recorded and they are averaged, direction finding with errors not exceeding plus or minus five degrees (at night up to plus or minus 20 degrees) is possible. Direction finding may be performed accurately against radio sets located at distances greater than 360 kilometers. Errors in the daytime amount to plus or minus two to three degrees, and at night approach plus or minus 10 to 15 degrees; however, when multiple bearings are taken, these errors are reduced considerably.

The reduction in direction-finding quality was greatly influenced by lack of data on the systemic errors associated with the relief of the terrain when the direction-finding means were relocated and set up in new areas. It is a difficult problem to determine such errors in the direction-finding sector in a short time, when positions are changed frequently due to the high rate of advance of the troops.

In addition, direction finding of radio sets when active jamming is being produced by SPETSNAZ means, poses considerable difficulties. It is obvious that when planning and conducting radio reconnaissance in a front operation, the most careful organization of cooperation in terms of time and tasks between the OSNAZ and SPETSNAZ units is required, and the mutual detailing of liaison officers is compulsory.

In the exercises, recommendations as to the desirable disposition of the battle formation of a radio reconnaissance regiment were researched. Since the most certain direction finding is carried out in the zones up to 80 kilometers and more than 360 kilometers away, the regiment's radio direction-finding means should be positioned in two lines. However, such a disposition severely hinders direction finding of radio sets by surface beam, since the required 400 to 500 kilometer base cannot actually be established under the current practice of placing three radio direction-finding companies in the first line. When placed a distance of 150 to 200 kilometers from each other, the flank direction-finding companies will be in different direction-finding zones, and simultaneous direction finding of the radio set will not occur.

Direction finding is feasible from the first line if the radio direction-finding companies are deployed a distance of 30 to 40 kilometers from each other. In this case it will be necessary to have no less tha[redacted] 50X1-HUM ten such companies on a 400 to 500 kilometer front, which is virtually unattainable. In the exercises the direction-finding base amounted to 90 kilometers. Even so, the regiment, which had three companies in the first

line, experienced difficulties in fixing the location of the radio sets. In addition, considering the frequent changing of positions by the radio direction-finding companies during the operation (once or twice per day) and the time normally required to close down and set up the radio direction finders, it may be assumed that one or two companies will always be in motion and, in fact, the first line of the regiment's battle formation will be absent. When direction finding is performed from the second line of the regiment's battle formation, linear errors increase, although they are smaller than in the zone 90 to 260 kilometers away.

Having considered the positive and negative aspects of the disposition of the battle formation of a radio direction-finding regiment, we believe that a two-echelon disposition of radio direction-finding companies is permissible only prior to the beginning of a front offensive operation. During the operation, however, it is most desirable to employ the single-echelon disposition of the regiment's battle formation and deploy the radio direction-finding companies in one line located more than 260 kilometers from the forward edge, which according to calculations ensures continuity of reconnaissance. Direction finding of radio sets via surface beam should be the responsibility of army OSNAZ radio battalions. This requires establishing a unified front radio direction-finding net. The regiment's battle formation may be relocated by echelons, e. g., three radio direction-finding companies and a radio intercept battalion conduct reconnaissance while two radio direction-finding companies and a second radio intercept battalion are relocated to new positions. The conclusions and calculations presented require further study and practical verification in exercises.

In the exercises, the capabilities of a separate OSNAZ radiotechnical regiment to conduct reconnaissance of ground-based radar sets from the ground and air, were researched. Artillery radars and the radars of air defense units were used as the targets of reconnaissance. The experience showed that it is desirable for reconnaissance of enemy ground-based radiotechnical means to be conducted on the most important axes by platoons of light radiotechnical sets, which in our opinion should be deployed a distance of five to 15 kilometers from the forward edge of one's own troops and no farther than 40 kilometers from each other. Long-range detection radars are monitored at a distance of 60 to 70 kilometers and in a large scanning sector, which makes it difficult to take bearings and results in errors on the order of six to 15 degrees. 50X1-HUM

The exercises confirmed that aerial radiotechnical reconnaissance is an effective means of obtaining reconnaissance information on ground-based

radar sets located 40 to 150 kilometers from the line of troop contact. In this way, up to 50 percent of the operating "enemy" radar sets were detected, as a rule.

One of the difficult problems is to maintain the continuity of the conduct of radiotechnical reconnaissance and control of the subunits while they are being relocated during an offensive operation. In order for the radiotechnical subunits not to lose touch with the reconnaissance targets, they must be relocated right behind the attacking troops. While heavy radiotechnical sets are being relocated, their tasks should be assigned to aerial radiotechnical reconnaissance.

To ensure continuous control of the OSNAZ units and rapid transmission of reconnaissance information, radio communications in the exercises were organized through the control post of the chief of intelligence of the front via radio printer links utilizing coding machines. The coded punched tapes were taken directly from the cipher organ to the transmitter of the regiment's communications center, which reduced radio message delivery time by five to ten minutes. Aerial radiotechnical reconnaissance data were transmitted directly from the aircraft, using a coded map and a signal table, which considerably reduced their passage time.

The passage of radio and radiotechnical reconnaissance data is characterized by the following time periods: transmission of the direction-finding command (from the moment the operation of the enemy radio set is detected) through the communications centers of the regiment and the radio direction-finding company -- one to two minutes; measuring the bearing, evaluating it, and transmitting the magnitude of the bearing to the regiment command post through the communications centers of the radio direction-finding company and the regiment (taking the parameters of the detected radar and transmitting them to the regiment command post) -- two to three minutes; collection, processing and analysis of the reconnaissance data at the regiment command post -- five to ten minutes; drafting reports and giving them to the cipher organ -- three to seven minutes; coding -- five to ten minutes; transmission of the punched tapes through the regiment's transmitter to the control post of the front chief of intelligence -- three to eight minutes. The total time spent on passage of the information is 19 to 40 minutes.

50X1-HUM

As we have seen, a great deal of time is expended at the regiment command post, in the cipher organs, and in transmitting the reports to the front intelligence directorate. Experience shows, however, that when the personnel are well trained and the work is better organized, the total time

may be reduced to 15 to 25 minutes. Organizing communications using the communications means already in service with the OSNAZ radio regiments, makes certain demands on the placement of elements of the battle formations of these regiments. Thus, it is desirable to place the radio intercept battalions no more than 70 kilometers from the front staff (and the regiment command post should be colocated with one of the battalions). A radio printer link must be set up between the regiment command post and the control post of the front chief of intelligence, using the appropriate radio sets and coding machines.

In a radio reconnaissance regiment it is desirable to set up two parallel radio nets (one for each radio intercept battalion), which will ensure that fixes are received from four to five direction finders. Assuming the coding and transmission of each command takes 20 to 25 seconds and the pause between them five seconds, then 1,200 to 1,400 commands may be transmitted on each radio net in one day. The proposed procedure for organizing radio communications ensures that direction finding is performed continuously, even while the regiment is being relocated by echelons. To control the radio direction-finding companies, it is necessary that the regiment commander have a separate radio net. Communications with the regiment's subunits operating on isolated axes are organized via independent radio links.

Special reconnaissance in the enemy rear is a basic and effective type of reconnaissance. In the exercises a limited range of the most important problems associated with the use of special-purpose reconnaissance groups was researched. The experience of the exercises showed that such a group composed of seven men is capable of conducting reconnaissance of targets in an area of up to 300 square kilometers in one day. In the exercises ten groups detected 11 actual targets, including six missile launching sites, in the course of 12 hours after landing.

The average error in determining the coordinates was 100 to 200 meters, which is sufficiently reliable to permit planning the neutralization of a target. However, due to the lack of special portable geodetic devices, the assessment of the target and determination of its coordinates took a great deal of time -- eight to 15 minutes. Coding the radio message required three to six minutes, transmitting it three to four minutes, and decoding at the control post and plotting the data on a map -- three to six minutes. As a result, the information was reported to the command 17 to 31 minutes from the moment the target was detected.

50X1-HUM

Obviously, it is a major task to reduce the time spent on determining coordinates and to increase their accuracy. This may be accomplished by the simultaneous fixing of the target from two or three points, and through improving the quality of the technical equipping of the reconnaissance groups. Reconnaissance personnel must have more improved means for surveillance and for automatic determination of target coordinates. Further improvement of secure troop control documents and improvement of radio set tactical-technical specifications are needed, so that the radio sets can be made smaller and communications carried on while on the move or from short halts.

In our opinion, the reconnaissance groups must be provided with transistorized receivers with a 2,000 to 6,000 kilohertz shortwave sub-band, which will give them a capability for continuous reception of instructions from the center, without taking the time to set up the cumbersome radio set antennas the groups have in their table of equipment. In turn the front chief of intelligence and the commander of the special-purpose unit will be able to issue priority instructions to the groups at any time.

We also need to positively resolve the problem of rapid transmission of commands to withdraw the reconnaissance groups and extricate them from the areas in which there are situated targets we plan to deliver nuclear strikes against.

The front chief of intelligence communicated with the special-purpose units and the radio center via radio links. Up to 10,000 groups of information were passed on each of them daily. However, the information flow was irregular, and in the maximum load period information was unavoidably delayed. For more reliable and efficient communications, radio-relay communications -- being more stable -- are required.

In the exercises, to ensure that communications with the special-purpose reconnaissance groups and individual sources were highly reliable, round-the-clock parallel monitoring of above-precedence calls was organized, and the data were received by the separate radio center and by the control post of the front chief of intelligence. This organization of simultaneous monitoring of the correspondents entirely proved its worth. To maintain reliable communications with especially important correspondents, and to increase the efficiency of control of special reconnaissance, the control post, like the radio center, needs a specially assigned receiver vehicle with the appropriate receivers and radio sets.

50X1-HUM

The conduct of integrated tactical-special exercises for reconnaissance units of division, army and military district subordination helps improve teamwork in all the reconnaissance organs and units, makes it possible to more fully work out the problems of cooperation among them, and also improves their level of field training under conditions which approximate actual combat.

The data of the exercises indicate that further improvement of the organization of reconnaissance and its technical equipping is needed. To increase efficiency in the control of reconnaissance and reduce the passage time for reconnaissance data, it is necessary for the chiefs of intelligence of the divisions, armies and front to have mobile control posts equipped with modern communications means, including radio-relay means, and also equipment for automating the collection and processing of reconnaissance information.

The state of the aerial photographic service of the reconnaissance aviation units and its technical equipping do not ensure that the results of aerial photography are processed quickly. Photographic materials have to be developed on board the reconnaissance aircraft in order to take the coordinates of targets from the wet negatives and transmit them to the interested staffs right in flight.

The technical reconnaissance means which are in service with the OSNAZ and SPETSNAZ units do not provide the required accuracy for determining the coordinates of targets, and require improvement.

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