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CENTRAL INTELLIGENCE AGENCY
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MEMORANDUM FOR: The Director of Central Intelligence

SUBJECT : MILITARY THOUGHT (USSR): Assessing the Radiation and Chemical Contamination Situation

1. The enclosed Intelligence Information Special Report is part of a series now in preparation based on the SECRET USSR Ministry of Defense publication Collection of Articles of the Journal "Military Thought". This article stresses the need to consider the effect of the radiation and chemical situation on the combat operations of the troops and the combat effectiveness of personnel. This need has raised essentially new demands to establish a special system of collecting, processing and reporting radioactive and chemical contamination data which is consistent with the nature of modern warfare. Such a system, as envisioned by the authors, is described and two diagrams illustrate the time periods needed for the collection and processing of information by analytical-calculating stations and the special radio nets which must be established. This article appeared in Issue No. 2 (81) for 1967.

2. Because the source of this report is extremely sensitive, this document should be handled on a strict need-to-know basis within recipient agencies. For ease of reference, reports from this publication have been assigned

William E. Nelson
Deputy Director for Operations

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[redacted]

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SUBJECT

MILITARY THOUGHT (USSR): The System of Collecting and Processing Data on the Radiation and Chemical Situation

SOURCE Documentary

Summary:

The following report is a translation from Russian of an article which appeared in Issue No. 2 (81) for 1967 of the SECRET USSR Ministry of Defense publication Collection of Articles of the Journal 'Military Thought''. The authors of this article are General-Mayor of Technical Troops N. Rumyantsev and Lieutenant-Colonel Yu. Vaulin. This article stresses the need to consider the effect of the radiation and chemical situation on the combat operations of the troops and the combat effectiveness of personnel. This need has raised essentially new demands to establish a special system of collecting, processing and reporting radioactive and chemical contamination data which is consistent with the nature of modern warfare. Such a system, as envisioned by the authors, is described and two diagrams illustrate the time periods needed for the collection and processing of information by analytical-calculating stations and the special radio nets which must be established.

End of Summary

[redacted] Comment:

The late General-Mayor Nikolay Fedorovich Rumyantsev was also head of an unspecified department of the Military Chemical Defense Academy, Red Star, 16 September 1967. Lt.-Col. Yu. Vaulin co-authored an article on commanders' estimates of radiation situation, Voyennyy Vestnik, No. 6, 1967. The SECRET version of Military Thought was published three times annually and was distributed down to the level of division commander. It reportedly ceased publication at the end of 1970.

[redacted]

The System of Collecting and Processing Data on the Radiation and Chemical Situation

by

General-Mayor of Technical Troops N. Rumyantsev and
Lieutenant-Colonel Yu. Vaulin

The highly mobile nature of combat actions and the complex radiation, chemical and bacteriological situation in modern operations have necessitated rapid collection and processing, on a unit, large unit and operational formation scale, of all kinds of information, and in particular, data on the radiation, chemical and bacteriological contamination of terrain, personnel and combat equipment.

Because of this, they are taking measures in the troops to sharply reduce the time required to obtain these data. However, as demonstrated by the experience of operational command-staff exercises, war games and exercises with troops, the collection of reconnaissance data on an actual radiation and chemical situation has been given insufficient attention, even though decisions regarding combat actions of troops in the radioactive and chemical contamination zones and eliminating the aftereffects of an attack must be made on the basis of this information. At the same time, forecasting the radioactive and chemical contamination of terrain is essential. Sometimes decisions on the combat actions of the troops and on carrying out all measures to eliminate the effects of nuclear-chemical attack are made on the basis of forecast data without regard for reconnaissance data.

Meanwhile, the results of radioactive contamination forecasting, which is carried out in the troops and in military training institutions on the basis of nuclear burst parameters and mean high-altitude wind velocity, do not give a true contamination picture. There is no reliable, actual basis for ensuring the acquisition of precise initial data. Plotting nuclear bursts and determining their parameters, as we know, is the responsibility of the air defense troops. However, according to the experience of several exercises and war games, they cannot fulfil this task completely, since the task is an additional one for them and is combined with the detection and tracking of air targets. Sufficiently precise cooperation has not been organized between the air defense means and the information collection

centers, i.e., the front and army analytical-calculating stations (RAST) forecasting the radiation situation.

A unified net for collecting and processing meteorological information, also basic to forecasting the radiation and chemical situation, is not, as a rule, established. The front and armies have many meteorological stations, but they still have not been consolidated under unified control. These stations operate according to different programs, considering only the narrow requirements of their respective branches of the armed forces and troop arms, although all of them, as a matter of fact, obtain the same kind of information which also could be used for purposes of protecting the troops against weapons of mass destruction.

In our view, it is very difficult to make a reliable forecast of the radiation situation under existing conditions for obtaining initial data. The very complex processes of plotting coordinates, determining the parameters of nuclear bursts, and transmitting them to the collection centers, are reduced to simple transmission of data by intermediaries, which, in point of fact, distorts the procedure by which this information is obtained. While discussing the shortcomings of the forecasting method, we are a long way from thinking of abandoning it. Commanders and staffs of all echelons undoubtedly require forecast data when making decisions. However, this information must be based on precise radiation and chemical reconnaissance data.

The established radiation and chemical reconnaissance system ensures conducting it on all levels of all troop arms, starting from company-type (battery-type) subunits. Furthermore, for this purpose there must be specialized radiation and chemical reconnaissance subunits and units in the regiment, division, army and front. The current tendency toward transferring radiation and chemical reconnaissance activities directly to subunits and units, provided with the appropriate equipment, most fully meets the requirements of protecting troops against radioactive and toxic materials and the nature of modern combat operations.

Analytical-calculating groups (RAG) and analytical-calculating stations were established in division and army staffs during exercises and war games. However, in the majority of cases they worked only on forecasting radioactive and chemical contamination. Since they were not provided with communications means, they were unable to collect information on radioactive and chemical contamination and inform the troops about it. Besides, the personnel of these groups were lacking in teamwork and the necessary experience (certain persons were assigned in one exercise and

other persons in the second), which sometimes raised doubt about the advisability in general of establishing such groups.

In our view, the lack of organic analytical-calculating stations in armies and analytical-calculating groups in divisions in peacetime is a serious obstacle to fundamental improvement of the entire system of collecting and processing data on the radiation and chemical situation. Without a firmly established sequence and procedure for issuing radioactive and chemical contamination reports, needless duplication and confusion occur in the collection of this information and, as a result, the troops are not warned of radioactive and chemical contamination in time.

The need to constantly consider the effect of the radiation and chemical situation on the combat operations of the troops and the combat effectiveness of personnel has raised essentially new demands to establish a special system of collecting, processing and issuing radioactive and chemical contamination data which is responsive to the nature of the modern operation and battle, and to find ways of improving this system, primarily through the existing means of troop control. By such a system we mean the aggregate of interconnected information sources and centers equipped with various systems of technical means, working in firmly established sequence and providing the staffs with all the information needed to estimate the radiation and chemical situation.

This system, in our view, must include radar posts (special plotting posts) capable of issuing coordinates of nuclear bursts and determining their parameters; radiometeorological stations providing the periodic measurement and issuing of data on wind velocity and direction at high altitudes; meteorological posts of subunits and units of the chemical troops for determining the weather in the surface air layer; sources (ground and aerial reconnaissance subunits and radiation and chemical observation posts of the subunits of all troop arms of information on the actual radiation and chemical situation; and, centers for collecting and processing data on the radiation and chemical situation (analytical-calculating groups in the divisions and analytical-calculating stations in the armies and in the front).

It is desirable, in our opinion, to organize the operation of the main elements of the system for collection and processing of data on the radiation and chemical situation in the following way.

Until the question of adopting special technical means is finally resolved, coordinates and parameters of nuclear bursts may be determined by

establishing a plotting system based on the use of existing radar stations. According to the experience of exercises, to monitor all zones of an army requires two or three special posts equipped with radar sets which do not have to fulfil any other tasks except the plotting of nuclear bursts.

The problem of the cooperation of these special posts with the analytical-calculating stations must be resolved. The problem is that each burst may be plotted simultaneously by two or three army radar posts and approximately the same number of front radar posts. If all of these posts report the data directly to the analytical-calculating station, filtering out the duplicate information will considerably hamper and slow down the pace of its operation. The filtering out principles already verified by the air defense troops should be adopted here. Further, a special post for the collection of information on the coordinates and parameters of nuclear bursts should be established; this post will receive information from plotting posts, analyze it and report simply to the analytical-calculating station about each burst.

Establishing a system for plotting nuclear bursts based on the use of existing radar stations even in just one of the military districts will permit already determining now the most desirable organic organizational structure of the system and the procedure for maintaining communications between the posts and information collection centers, accumulating experience in using the system, and preparing a base for rapidly equipping the posts and centers with new technical means.

In our opinion, the procedure for providing the troops of a front with mean wind data must be the following. Staffs of combined-arms armies will use data from the meteorological battery of the chief of rocket troops and artillery of the army, which has three sounding posts. One of these is deployed in the center of the operational disposition of the troops of the army, the second in the rear area of the army, and the third in reserve, which will permit covering the entire offensive zone of the army to a depth of 120 to 150 kilometers. The results of the sounding of these stations must be transmitted to the rocket troops and artillery staff, and from there to the operations department of the staff of the army and to the analytical-calculating station. At the same time the analytical-calculating station will receive on its own receiver the circular "mean ... weather" bulletin, transmitted by each of two automatic radiometeorological stations (ARMS).

It is desirable to deploy an automatic radiometeorological station from the separate hydrometeorological company of the front in the zone of a

tank army which does not have an organic meteorological battery. This station must transmit high-altitude wind data to the operations department and analytical-calculating station of the tank army.

Providing an army of the second echelon of the front and large units and units in the rear area with mean wind data must be made the responsibility of the separate hydrometeorological company of the front, which must deploy three sounding posts for this purpose. The information from these stations will be transmitted to the operations directorate and analytical-calculating station of the front, and also to the operations department of the staff of an army of the second echelon.

Transmission times for mean wind data should be made the same for all front automatic radiometeorological stations--six times in each 24-hour period, every four hours.

Protecting troops from weapons of mass destruction gives rise to the need for wider use of data on the actual developing radiation and chemical situation side by side with the results of radioactive and chemical contamination forecasting. Therefore, the system of obtaining data and estimating the radiation and chemical situation must be based on both of these means. Forecast results should be revised constantly on the basis of factual radiation and chemical reconnaissance data.

The staffs of the armies and the front can receive forecast data earlier than reconnaissance information. Therefore the forecast must be used first for an approximate estimate of the radiation situation. This estimate is essentially a determination of the effect of the radioactive contamination on the combat effectiveness of large units and units. A map or overlay showing zones subjected to radioactive contamination is used to determine in which zone (A, B or C) a unit or large unit might be located and the possible duration of its operations there.

It is known that the collection of data on the actual radiation and chemical situation now goes through the channel from company to battalion to regiment to division to analytical-calculating station of an army to the analytical-calculating station of the front. It is desirable, in our view, to allocate the responsibilities for collection and processing of these data on the company commander in the company, on the chief of staff in the battalion, on the chief of the chemical service in the regiment, on the deputy chief of the chemical service for reconnaissance in the division, and on the analytical-calculating station in the army and the front.

Research shows that information on the radiation and chemical situation at the levels from battalion to front now may be collected and processed in the time frames indicated in Diagram 1. It goes without saying that these time frames do not permit considering the effect of the radiation and chemical situation in advance when making decisions, especially at the operational level.

This process can be accelerated considerably by using the promising method of network planning and control in organizing the operation of the entire system of collection of data on the radiation and chemical situation. For example, the collecting of data on the coordinates and parameters of nuclear bursts and on areas where chemical weapons were used, the plotting of these data on a map, the forecasting of radioactive contamination, the calculating of radiation doses and the collecting of reconnaissance information on the actual developing radiation and chemical situation, fall within the critical processes determining the minimum possible duration of work. Consequently, we have to find ways of reducing the duration of these processes, monitor especially carefully the observance of established time periods for carrying them out, and take operational measures to prevent a breakdown in this work.

If the chief of the chemical service in a regiment is given in addition, one assistant, data on the actual radiation situation will be collected and reported to the commander in only 15 minutes. The division staff also will receive this information correspondingly sooner.

A considerable amount of information on the radiation and chemical situation will be received in the staff of a division by various duty personnel through various communications channels. Processing these data requires collecting and decoding all reports, recording them in the log, reducing them to a common sidereal time, plotting on the map, drawing isolines of zones, calculating possible radiation doses, reporting to the division commander, informing the staff of the division and preparing reports to the staff of the army. One man, who, with sufficient effort, now fulfils this work, can finish it in one hour and 40 minutes, as the experience of exercises shows. If the division has an organic analytical-calculating group, these data will be completely processed in 40 minutes.

The analytical-calculating group in a division, besides collating data on the actual radiation and chemical situation, will collect information on nuclear bursts and areas where chemical weapons were used, forecast radioactive and chemical contamination, receive meteorological data, and inform division units and separate subunits of the forecast and the actual

developing radiation and chemical situation. According to the experience of research, the optimum composition of the group may be four to six men (two officers and two to four NCO and enlisted men). It must have direct radio communications with chiefs of the chemical services of the regiments and the analytical-calculating station of the army.

The time spent on the collection of information on the radiation and chemical situation in the staffs of the army and the front can be reduced considerably by the establishment of direct communications between the analytical-calculating groups of the divisions and the analytical-calculating stations of the army and front, and also by using other communications channels. In the latter case, in order to earmark information of interest to us out of the general flow of reports of an operational-tactical nature, a distinctive group of signals (for example "111") should be transmitted at the beginning of each radiogram or telegram on the radiation and chemical situation. All messages with such a group received at the communications center or in other directorates and departments of a staff must, in accordance with communications instructions, be simultaneously routed to the analytical-calculating station, regardless of the addressee. This procedure, in our view, ensures more complete and timely receipt of information at the analytical-calculating station of the army and the front.

The availability of only one radio net, on which the collection of data and information on the radiation and chemical situation is accomplished, is not satisfactory for the staffs and troops. It has been established that 40 minutes is spent on obtaining data from one army and another 45 minutes on reciprocal information. To accomplish a mutual exchange of information of the analytical-calculating station of the front with all of the analytical-calculating stations of the armies on one radio net requires at least seven hours. In one 24-hour period, the division communications link with the analytical-calculating station of the army will be loaded for 10 hours and 30 minutes just with transmissions of radiation and chemical situation data, and, correspondingly, the link of the analytical-calculating station of the army with the analytical-calculating station of the front, 14 hours and 20 minutes. The remaining time is totally insufficient for obtaining reciprocal information. The analytical-calculating station of the front needs at least one more radio set, and the army analytical-calculating station of the army, one additional receiver.

The experience of exercises shows that timely receipt of information is achieved only when, in addition to using command and staff

communications lines, special radio nets are established for collecting data and information on the radiation and chemical situation (Diagram 2). The communications lines which are not now provided by organic radio means are represented in the diagram by a dotted line. The lack of direct communications by the analytical-calculating group of the division and the analytical calculating station of the army with the sources of information is a serious obstacle to the establishment and improvement of the entire system of data and information collection on the radiation and chemical situation.

One way to reduce the time spent on the collection and processing of information and its receipt by the analytical-calculating stations and staffs is to simplify the system of encoding data on nuclear bursts and radiation levels measured on the ground. In our view, only the burst coordinates and radiation level measuring points need be encoded; the burst parameters (yield, type, time), as well as the magnitude of the radiation level, may be transmitted in plain text. The enemy, you know, knows his own bursts and their timing.

Analysis of analytical-calculating station work shows that under the existing system of forecasting and collecting data on the actual radiation and chemical situation, and under conditions when the commander of the troops of the front or the commander of the army is located at the forward command post, the information he needs to make or amplify a decision may be received from the analytical-calculating station of the front or army only in five to seven hours. Obviously, the collection of data on the radiation and chemical situation must be done at the same time at the forward command post. However, neither the forces nor the means have been provided for this at present. A number of military districts are proposing to assign a calculating group, made up of front and army analytical-calculating station personnel, to the forward command post to forecast the radiation situation primarily in support of the main grouping. It seems to us more desirable for the front and army forward command posts to have an organic analytical-calculating section, a component of the analytical-calculating station, with communications means necessary for receiving data on nuclear burst parameters and the radiation and chemical situation.

The high degree of training of the personnel of analytical-calculating groups and analytical-calculating stations, attained by appropriate training in peacetime, plays a substantial role in the speed of issuing of data on the radiation and chemical situation. Therefore, because of the possibility of the delivery of a surprise nuclear strike by the enemy, in order to increase the combat effectiveness of the troops, in our view, it

is necessary in peacetime to have the foundation of an organic structure of a system of collection and processing, of data on the radiation and chemical situation, i.e., organic analytical-calculating groups in divisions and organic analytical-calculating stations in armies.

Improving the system of collecting and processing data on the radiation and chemical situation will ensure the successful conduct of combat operations by the troops under the conditions of widespread use of weapons of mass destruction.

(see Diagrams 1 and 2 on following pages)

Diagram 1

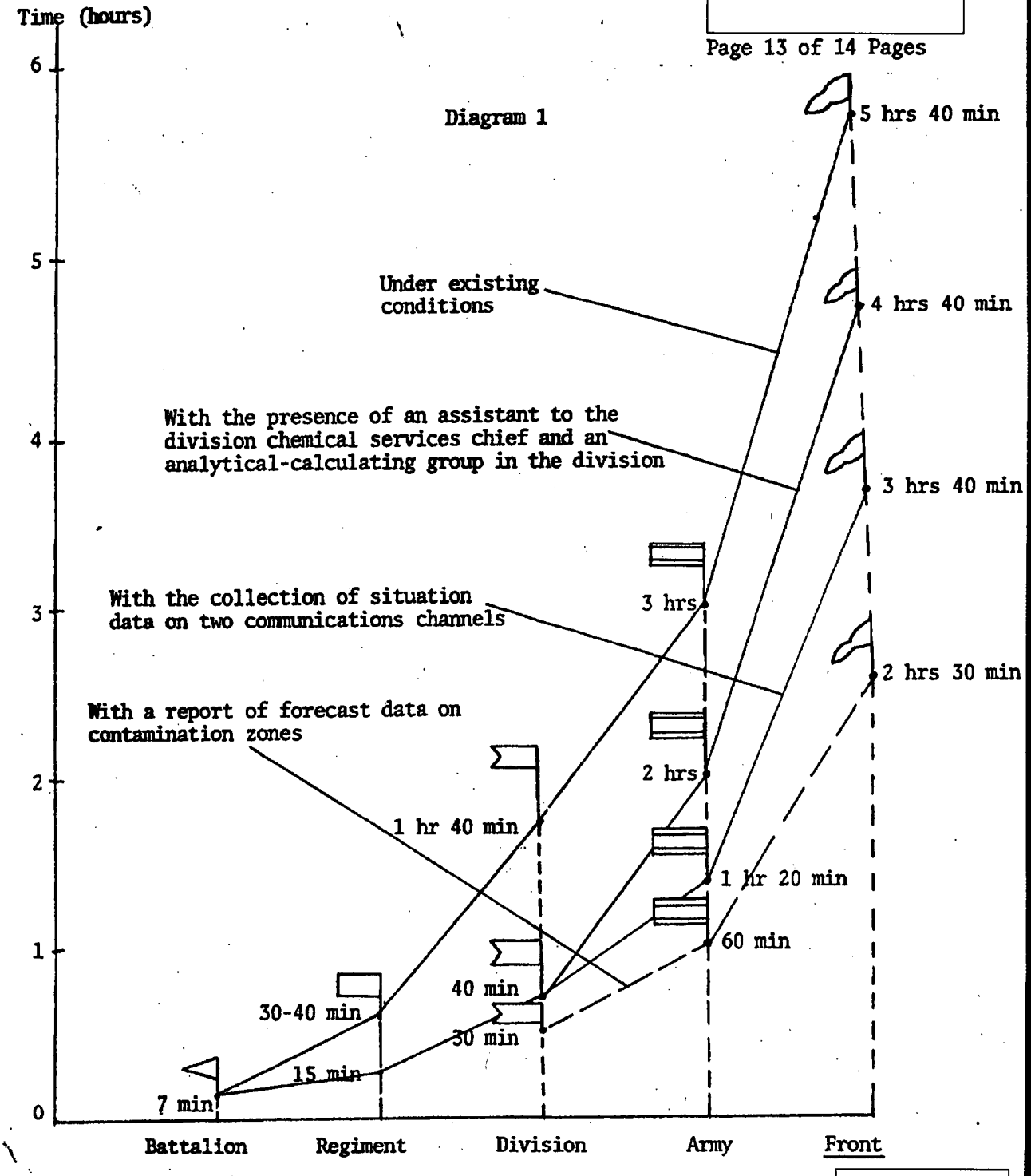

Diagram 1. Issuing time for radiation and chemical situation data in various staffs

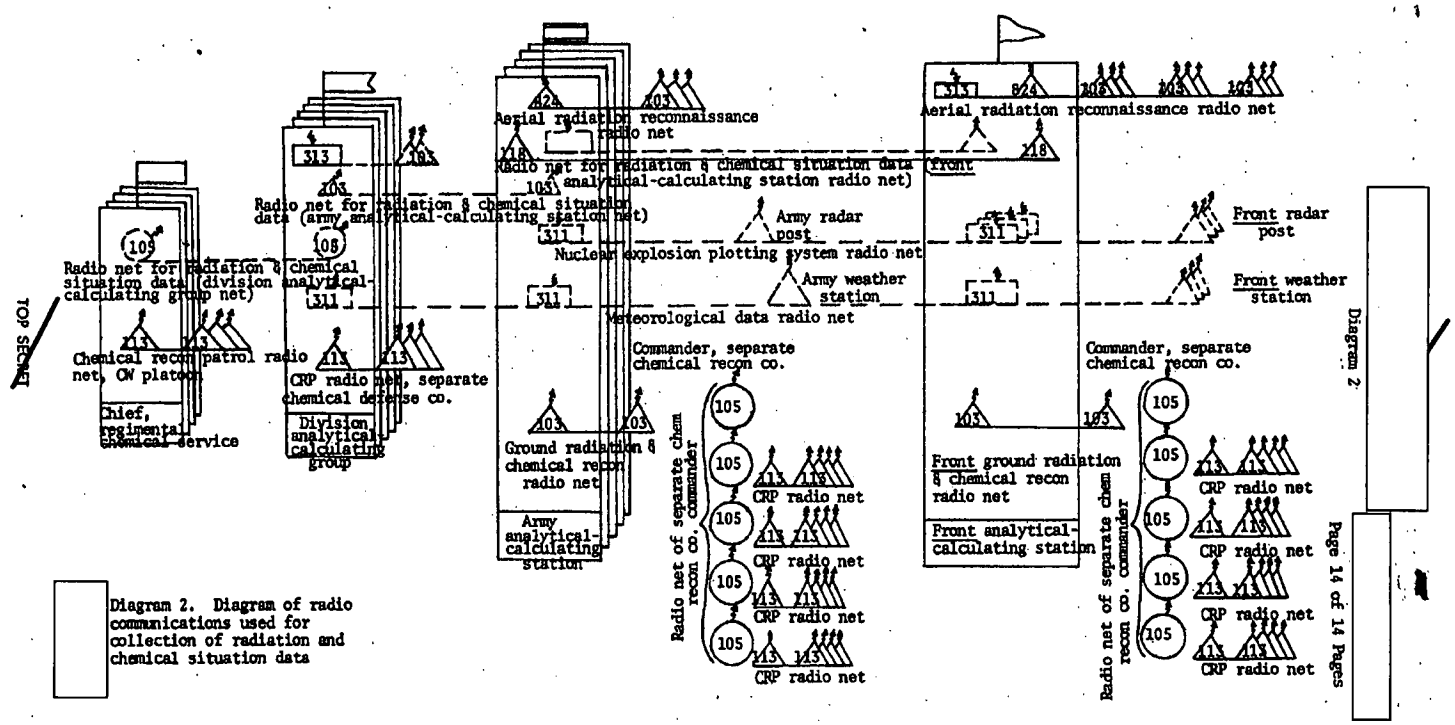

Diagram 2. Diagram of radio communications used for collection of radiation and chemical situation data