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CENTRAL INTELLIGENCE AGENCY
WASHINGTON, D.C. 20505

3 May 1978

MEMORANDUM FOR: The Director of Central Intelligence
FROM : John N. McMahon
Deputy Director for Operations
SUBJECT : MILITARY THOUGHT (USSR): Ways of Increasing
the Reliability of Secure Shortwave
Radio Communications

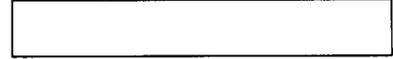
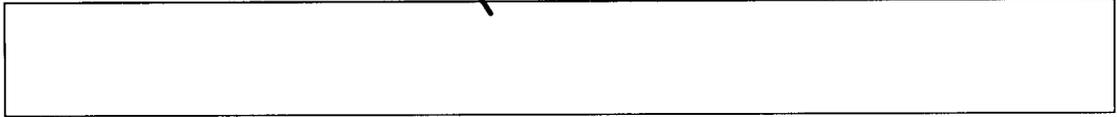
1. The enclosed Intelligence Information Special Report is part of a series now in preparation based on the SECRET USSR Ministry of Defense publication Collection of Articles of the Journal "Military Thought". This article deals with the proposals made at the Seventeenth Military Science Conference of the Military Communications Academy (21 to 23 November 1963) to improve the reliability and operation of secure shortwave radio communications. The conference participants noted that the reliability of secure shortwave radio communications was not fully satisfying the requirements made of them and cited as an example the 50 to 60 percent serviceable operation factor for the secure radio communications provided by field means. This article appeared in Issue No. 2 (72) for 1964.

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

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Intelligence Information Special Report

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COUNTRY USSR

[Redacted]

DATE OF INFO. Mid-1964

DATE 3 May 1978

SUBJECT

MILITARY THOUGHT (USSR): Ways of Increasing the Reliability of Secure Shortwave Radio Communications

SOURCE Documentary

Summary:

The following report is a translation from Russian of an article which appeared in Issue No. 2 (72) for 1964 of the SECRET USSR Ministry of Defense publication Collection of Articles of the Journal "Military Thought". The author of this article is Engineer Lieutenant Colonel M. Glukhov. This article deals with the proposals made at the Seventeenth Military Science Conference of the Military Communications Academy (21 to 23 November 1963) to improve the reliability and operation of secure shortwave radio communications. The conference participants noted that the reliability of secure shortwave radio communications was not fully satisfying the requirements made of them and cited as an example the 50 to 60 percent serviceable operation factor for the secure radio communications provided by field means.

End of Summary

[Redacted] Comment:

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.

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Ways of Increasing the Reliability of Secure
Shortwave Radio Communications

by
Engineer Lieutenant Colonel M. Glukhov

The Seventeenth Military Science Conference of the Red Banner Military Communications Academy, which was held on 21 to 23 November 1963, discussed the problems of improving the operation and increasing the reliability of the secure radio printer communications employed to control troops.

Participating in the work of the conference were generals and senior officers from the directorates of the Chief of Communications Troops of the Ministry of Defense and the branches of the armed forces, from a number of military districts, groups of forces, and armies, and from several military educational institutions, scientific research institutes, and communications units.

The conference heard and discussed more than 15 papers and reports which, for the purpose of developing practical recommendations for the troops applicable to the existing inventory of radio sets, analyzed the results of the task assigned by the Minister of Defense and carried out by communications troops of mastering the organization of stable communications in highly mobile combat actions.

In their papers and addresses, the conference participants emphasized that as a result of the synthesizing of the experience of communications operations in major troop exercises and in staffs and of the analysis of the operation of specially organized experimental microwave links, it was determined that at the present time the reliability of secure shortwave radio communications does not fully satisfy the requirements made of them. Thus, for example, the serviceable operation factor for secure radio communications provided by field means ranges on the average from 50 to 60 percent. Taking into account the considerable complexity of a situation upon the initiation of combat actions, which might lower communications reliability even more, the conference participants recommended that special

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attention be devoted to the necessity of considering all of the operational factors which could take place in the operations of a future war (the nature of the combat actions, the information flow, the radio countermeasures, the increased level of radio interference, etc.) and that an assessment of the reliability of secure shortwave radio communications be based on their capability of ensuring efficient troop control. In connection with this, it is necessary to define the limitations on the transmission of information that arise as a result of the distinctive features of control when wire, radio-relay, and other communications are disrupted and when only secure shortwave radio communications are being employed.

In the opinion of the conference participants, one of the reasons for the inadequate reliability of secure shortwave radio communications is the constantly changing state of the ionosphere and the excessive loading of the shortwave band, frequently resulting in interference greater than the useful signals and in the disruption of communications. Under these conditions, one can increase the reliability of radio communications by the flexible shifting of the technical means and wavelengths, which makes it necessary to ensure in an organized and technical manner a strict, centralized direction over the radio communications within the system of field communications centers. For this purpose, and also in connection with the growing number of radio means at all levels of control, it is being proposed that radio controller posts be set up which would be an organic part of the communications centers and be headed by the radio communications duty officer or, at the most demanding moments, by the senior officer of the communications directorate. There should also be two to three specialists in the complement of this post to service the equipment belonging to it.

The principal tasks of the radio controller post might be: to continuously study the communications situation in order to establish in good time new or alternate communications and shut down unneeded radio communications; to direct radio communications when control posts are relocating; to direct the work of all the radio nets and radio links in order to ensure the timely shifting of means for the maintenance of stable radio communications; to monitor the operation of the communications channels; to determine the levels of interference on the allocated communications frequencies and to shift frequencies; to

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conduct wavelength reconnaissance, the engineer-technical allocation of the suitable frequencies, the sounding of the ionosphere, and to disseminate these data to the lower-level communications centers; to monitor the flow of information through the radio channels; and to direct as a whole the secure radio channels.

Apart from the establishment of radio controller posts, the conference recommended the wider use of the methods of organizing radio communications through radio links with duplex transmissions, which, under certain conditions, ensures that the transmitted (received) signal exceeds the interference. The operation of a duplex transmission on a single frequency, because of the simplicity with which it can be carried out in practice, and because of its effectiveness, is at present the most suitable method for the troops.

The conference participants noted that at the operational level of control, the power of the R-118 radio set (200 watts) is proving to be insufficient for stable secure telegraphic radio communications. That is why in the military district and army communications units they must be replaced by the more powerful R-102 radio sets (800 watts). In addition, an effort must be made to unload the shortwave band by utilizing more extensively ultra-shortwave radio sets and, in particular, the R-122 tropospheric radio sets. The operation of these radio sets was made difficult, as is known, by the unwieldiness of their antenna structures, which required a considerable amount of time for their deployment. At the present time, several communications units (Odessa Military District) have succeeded in simplifying the antenna structure without any significant loss in the reserve of the stability of radio communications, which, as a result, has opened up the possibility of extensively utilizing these sets.

Scientific research has shown that extended interruptions of secure communications, which lower their reliability, occur because of the complexity of channel traffic in the communications centers, which are serviced by specialists with different fields of specialization. Allocating these radio communications channels, together with the secure communications equipment, from the complement of the communications center does not solve this problem, since the communications center becomes even more complex and the shifting of means is impeded. Taking



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all of this into account, the conference participants recommended that a certain number of integrated operations vans with radio receivers in them be fitted out with secure communications equipment and teleprinters. Combining in the same van the entire set of equipment needed to set up a secure radio channel will make it possible to increase its reliability by reducing the time required to adjust and tune the channel, which must be done every time communications are interrupted.

In this way, the integrated operations vans will considerably simplify the operating-technical servicing of the secure radio channel and increase the mobility of the communications center. These operations vans are already being equipped in this manner in communications units of the Carpathian Military District and certain other military districts.

Research which preceded the conference and which was cited in the reports and addresses, showed that the complexity and insufficient technical efficiency of the equipment employed on secure radio communications have made it necessary to train with special thoroughness the personnel of the communications troops. At present, because of the limited employment of secure radio communications, staffs and personnel are not obtaining enough practice in the skilful utilization of these communications. In this case, these limitations are not always dictated by the operational-tactical conditions that have developed, but arise as a result of the traditions of basing troop control on wire and radio-relay lines.

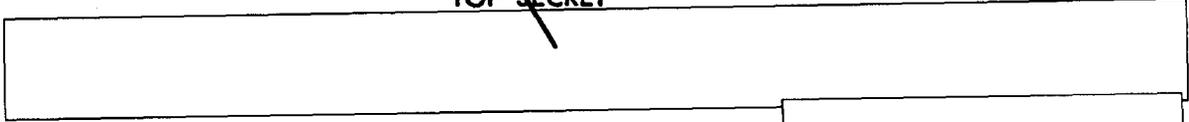
Often cited in limiting radio communications is the need for radio camouflage. However, banning radio communications cannot be the only method of radio camouflage. For the purposes of radio camouflage, radio deception and other measures can be implemented, making it possible to develop well in advance in peacetime troop control based on radio communications.

In connection with this, the conference recommended the wider use of secure radio communications in exercises and under routine daily conditions, as well as the more frequent practice of radio drills for the personnel in field communications centers and of setting up the entire set of equipment.

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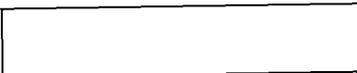
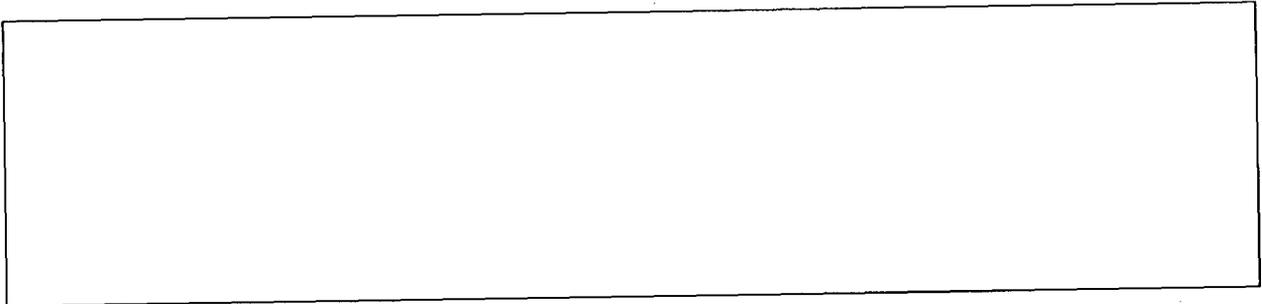
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It was also noted in the conference that reliable troop control based on radio communications can be achieved by the integrated employment of all the technical means -- automatic means and advance enciphering and coding -- that render communications secure. Therefore, the indispensable condition for the integrated employment of all of these means is their organized and technical consolidation based on the establishment of unified organs of secure communications that are subordinated to the chiefs of the communications troops.



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