

APPROVED FOR RELEASE: 2007/02/08: CIA-RDP82-00850R000100030032-2

1 OF 1

FOR OFFICIAL USE ONLY

JPRS L/8329

12 March 1979

TRANSLATIONS ON USSR MILITARY AFFAIRS
(FOUO 8/79)



U S S R



U. S. JOINT PUBLICATIONS RESEARCH SERVICE



FOR OFFICIAL USE ONLY

NOTE

JPRS publications contain information primarily from foreign newspapers, periodicals and books, but also from news agency transmissions and broadcasts. Materials from foreign-language sources are translated; those from English-language sources are transcribed or reprinted, with the original phrasing and other characteristics retained.

Headlines, editorial reports, and material enclosed in brackets [] are supplied by JPRS. Processing indicators such as [Text] or [Excerpt] in the first line of each item, or following the last line of a brief, indicate how the original information was processed. Where no processing indicator is given, the information was summarized or extracted.

Unfamiliar names rendered phonetically or transliterated are enclosed in parentheses. Words or names preceded by a question mark and enclosed in parentheses were not clear in the original but have been supplied as appropriate in context. Other unattributed parenthetical notes within the body of an item originate with the source. Times within items are as given by source.

The contents of this publication in no way represent the policies, views or attitudes of the U.S. Government.

COPYRIGHT LAWS AND REGULATIONS GOVERNING OWNERSHIP OF
MATERIALS REPRODUCED HEREIN REQUIRE THAT DISSEMINATION
OF THIS PUBLICATION BE RESTRICTED FOR OFFICIAL USE ONLY.

BIBLIOGRAPHIC DATA SHEET		1. Report No. JPRS L/8329	2.	3. Recipient's Accession No.
4. Title and Subtitle TRANSLATIONS ON USSR MILITARY AFFAIRS, (FOUO 8/79)			5. Report Date 12 March 1979	6.
7. Author(s)			8. Performing Organization Rept. No.	
9. Performing Organization Name and Address Joint Publications Research Service 1000 North Glebe Road Arlington, Virginia 22201			10. Project/Task/Work Unit No.	
			11. Contract/Grant No.	
12. Sponsoring Organization Name and Address As above			13. Type of Report & Period Covered	
			14.	
15. Supplementary Notes				
16. Abstracts The report contains information on the Soviet military and civil defense establishments, leadership, doctrine, policy, planning, political affairs, organization, and equipment.				
17. Key Words and Document Analysis. 17a. Descriptors USSR Military Organizations Military Facilities Military Personnel				
17b. Identifiers/Open-Ended Terms				
17c. COSATI Field/Group 15C				
18. Availability Statement FOR OFFICIAL USE ONLY. Limited Number of Copies Available From JPRS			19. Security Class (This Report) UNCLASSIFIED	21. No. of Pages 52
			20. Security Class (This Page) UNCLASSIFIED	22. Price

FORM 10-75 (REV. 1-72)

THIS FORM MAY BE REPRODUCED

USCOMM-DC 14952-P72

FOR OFFICIAL USE ONLY

JPRS L/8329

12 March 1979

TRANSLATIONS ON USSR MILITARY AFFAIRS

(FOUO 8/79)

CONTENTS

PAGE

Comments on U.S. Actions in the Middle East (S. Krakhmalov; ZARUBEZHNOYE VOYENNOYE OBOZRENIYE, Nov 78)...	1
Comments on U.S. Noncommissioned Officers in Europe (A. Chekulayev; ZARUBEZHNOYE VOYENNOYE OBOZRENIYE, Nov 78)...	10
Comments on Offensive Operations on a U.S. Army Corps (A. Ryzhkov; ZARUBEZHNOYE VOYENNOYE OBOZRENIYE, Nov 78).....	17
Comments on Tank Development in Western Countries (Yu. Kraynyuk; ZARUBEZHNOYE VOYENNOYE OBOZRENIYE, Nov 78)....	25
Development of Field Artillery Ammunition in West (V. Vorontsov, V. Vyacheslov; ZARUBEZHNOYE VOYENNOYE OBOZRENIYE, Nov 78).....	32
Comments on Role of Human Factor in Aircraft Accidents (O. Oblipov, K. Vladimirov; ZARUBEZHNOYE VOYENNOYE OBOZRENIYE, Nov 78).....	39
Comments on NATO Air Force Exercise Held in June 1978 (V. Kondrat'yev; ZARUBEZHNOYE VOYENNOYE OBOZRENIYE, Nov 78).....	47
Comments on Development of New U.S. Unmanned Aircraft (I. Aleksandrov; ZARUBEZHNOYE VOYENNOYE OBOZRENIYE, Nov 78)..	50

- a -

[III - USSR - 4 FOUO]

FOR OFFICIAL USE ONLY

FOR OFFICIAL USE ONLY

COMMENTS ON U. S. ACTIONS IN THE MIDDLE EAST

Moscow ZARUBEZHNOYE VOYENNOYE OBOZRENIYE in Russian No 11, Nov 78
signed to press 3 Oct 78 pp 3-10

[Article by Maj Gen Tank Trps S. Krakhmalov: "The Middle East -
Center of Tensions"]

[Text] The Middle East is a vast region with a population of more than 130 million. It includes 13 Arab states, Turkey, Cyprus, and Israel, and lies at the intersection of three continents: Europe, Asia, and Africa. In the Pentagon assessment, the Middle East is an important strategic region, the southern core of NATO and the "gateway" to Africa. The shortest sea and air routes between Europe and Asia pass through it. The Middle East is right next to the borders of the countries of the socialist community. The politics and military plans of the United States attach great importance to the oil riches of the Middle East. According to official American figures, this region has more than 70 percent (excluding the socialist countries) of explored reserves of "black gold."

The book "Vneshnyaya Politika i Natsional'naya Bezopasnost' SShA" [The Foreign Policy and National Security of the United States of America], which revealed the objectives of the J. Carter administration in the foreign policy area, emphasizes: "One of the strategic problems of paramount importance facing those who create U. S. policy is keeping the Middle East and the Mediterranean as a region in which American power can be effectively deployed." As this work points out, the U. S. objective in this region is not just to insure access to a strategic raw material (petroleum), but also to "prevent the spread of any foreign influence there."

After World War II, of course, the Arab countries of the Middle East broke the chains of colonialism through stubborn national liberation struggle and acquired independence. The adoption of the path of progressive transformations by several Arab countries and the conversion of the Middle East into one of the leading centers of the national

FOR OFFICIAL USE ONLY

FOR OFFICIAL USE ONLY

liberation movement, which operated on the whole as a factor opposed to imperialism, gave rise in the United States to an intention to stop the development of such unfavorable, from the standpoint of the American leaders, trends at any cost.

The United States relies primarily on Israel, which Washington would like to use to settle with the progressive regimes of this region, and on the Arab conservative governments, reactionary circles, and bourgeoisie who are tied to imperialist monopolies by common interests.

All these military-strategic, political, and economic considerations have caused constant U. S. "attention" to the Middle East, which has been a dangerous center of tension for 30 years now.

The Palestinian War of 1948-1949, the Anglo-Franco-Israeli aggression against Egypt in 1956, the landing of U. S. marines in Lebanon in mid-1958, the Israeli aggression against Egypt, Jordan, and Syria in June 1967, the Arab-Israeli War of 1973, the attempt by Turkish forces on the northern part of the island of Cyprus to overthrow the government and occupy the island in July 1974, the armed struggle in Lebanon, and border clashes between various states — this is by no means a full list of the military conflicts which have brought grief and tears to the peoples of the Middle East. The problem of Arab-Israeli relations has been and remains the fundamental factor in these events.

"There is no war in the Middle East now. But there is no peace there either, let alone tranquility. And who dares to say that the flames of war will not flare up again? This danger will continue as long as the Israeli armies remain on occupied lands. It will continue as long as hundreds of thousands of Palestinians, driven from their land, are deprived of their legal rights and live in desperate circumstances and the Arab people of Palestine are deprived of the possibility of establishing their own national state. Stable peace in the Middle East also demands that the security of all states of this region, their right to independent existence and development, be guaranteed. Certainly it is clear that those who, pursuing egotistical ends, turn a Middle Eastern settlement into an object of political gains, who use separate partial agreements to set back the time of true solutions and sometimes to question them in general, are taking on a grave responsibility." This is the concise analysis given by General Secretary of the CPSU Central Committee Comrade L. I. Brezhnev of the situation in the Middle East and its explosive nature in the Accountability Report of the Central Committee to the 25th party congress.

It is common knowledge that soon after the Arab-Israeli War of 1973 when the Geneva Conference began to meet, favorable conditions were established for a peaceful settlement of this conflict. But the United States preferred Kissinger's "shuttle diplomacy," which aimed at preparing partial, separate agreements. Upon coming to power, the present American administration criticized the technique of "shuttle diplomacy" in words and announced that it would be necessary to coordinate actions

FOR OFFICIAL USE ONLY

with the USSR to resolve the whole set of issues making up the Arab-Israeli problem.

A joint Soviet-American statement on the Middle East was adopted on 1 October 1977. It stated: "The Soviet and American sides believe that all concrete issues of the settlement should be decided within the framework of an all-encompassing settlement of the Middle Eastern problem; among these concrete issues are such key matters as withdrawal of Israeli troops from territory occupied during the 1967 conflict, the Palestinian question, which includes guaranteeing the legal rights of the Palestinian people, ending the state of war and establishing normal peaceful relations based on mutual recognition of the principles of sovereignty territorial integrity, and political independence."

The statement went on to say that the USSR and the United States, as co-chairmen of the Geneva Conference, would work together to see that the conference reopened by no later than December 1977 for the purpose of resolving all these issues. Just a few days later, however, after Carter met with Dayan in New York, Washington, under pressure from militaristic circles and the Zionist lobby, in reality rejected the Geneva Conference and inspired and supported separate Egyptian-Israeli negotiations, which once again led the process of Middle Eastern settlement into a blind alley and created a threat to the cause of peace.

In late November 1977 Egyptian President Sadat came forward with a "peace initiative" and, making a pilgrimage to Jerusalem which was occupied by the Israelis, held talks there with Israeli Prime Minister Begin. Israeli ruling circles, who had been striving for separate negotiations for a long time, willingly accepted a bilateral meeting with Sadat. As for the Egyptian president himself, he has done everything possible in recent years to achieve a political reorientation of his country.

In traveling to Jerusalem Sadat hoped that Egypt and the other Arab states would prove their reliability to Washington from the point of view of American interests in the Middle East so that the United States would take the side of the Arabs, force Israel to renounce its aggressive policy, and secure a just and all-embracing settlement of the Middle Eastern conflict. In Washington, however, the very idea of putting pressure on the aggressor was rejected. U. S. reliance on Israel remains unchanged.

Sadat's decision to take the humiliating path of separate negotiations with Israel was met with exaltation by the bourgeois West but led to a deep split in the Arab world. Syria, Algeria, Iraq, Libya, the People's Democratic Republic of Yemen, and the Palestine Liberation Organization resolutely condemned the capitulationist policy of the Egyptian president at a summit meeting in Tripoli on 1 December 1977. In response Egypt broke diplomatic relations with these five countries. Cairo's capitulationist line furthered the polarization of forces in the Arab world and offered an opportunity for reactionaries to raise their heads and furiously attack progressive movements.

FOR OFFICIAL USE ONLY

Sadat's "sacred mission of peace" led to a whole series of meetings between Egyptian and Israeli leaders during which the pointlessness and danger to the Arabs of separate diplomacy became clear. In Tel Aviv Cairo's gesture of "historical reconciliation" was interpreted as evidence of Egypt's weakness. It was no accident that this move encouraged the traditional rigidity and uncompromising attitude of the Israeli leadership in its view of the Middle Eastern conflict.

As a result of the "Sadat mission," Israeli Prime Minister Begin announced that resolution No 242 of the U. N. Security Council supposedly did not apply to the West Bank of the River Jordan and the Gaza Strip and therefore Israel did not intend to withdraw its troops from these territories. Tel Aviv announced loudly that it did not recognize the right of the Palestinians to establish their own state and permit refugees to return to these regions. Of course, the "Palestinian autonomy" declared in this announcement was nothing but a form of Israeli annexation of Arab lands seized in the 1967 war.

The meetings and talks between Egypt and Israel which have taken place this year have not contributed anything new to solving the Middle Eastern problem, despite concessions by Sadat, who is trying to get at least the appearance of an agreement with Israel. The three-party meeting of the Egyptian and Israeli ministers of foreign affairs and the U. S. Secretary of State held at American initiative on 18-19 July 1978 in the Medieval Leeds Castle near London did not produce any real results either.

After these talks the foreign press reported that Israel had proposed to establish limited autonomy for the Arab population on the West Bank of the River Jordan while maintaining for five years Israeli rule with its military settlements and garrisons. After five years there would be a referendum which would determine the further fate of this region. These Israeli conditions are not only intended to reinforce its hold on seized Arab territories, but also strike a blow against the Arab people of Palestine and their struggle for the right to independent existence.

Meanwhile the situation of the Palestinian Arabs who were driven from their native land is becoming more and more unbearable. It is estimated that just 500,000 of them remain in Israel itself, within the 1949 boundaries, while 760,000 live in the West Bank of the River Jordan region occupied by Israel in 1967, 430,000 in the Gaza Strip, up to 900,000 in Jordan, about 400,000 in Lebanon, and 250,000 in Kuwait. If we consider that the Palestinian problem is pivotal in the whole Middle Eastern crisis, the degree to which Egypt betrayed common Arab interests becomes obvious.

Recent events in Lebanon are also associated with an attempt to strike a blow against the forces of the Palestine Resistance Movement.

Let us recall that Lebanon, with a population of 3 million, instituted a system of confessionalism, representation in the highest governmental

FOR OFFICIAL USE ONLY

bodies according to the religious principle, in 1943, which was when it declared its independence. In this system the Christian communities, especially the Maronite which is the most influential, were given certain advantages. In particular, six Christians were elected for every five Muslims in the Parliament, which has 99 deputies. The president of the republic is always a Christian, the prime minister a Sunni Muslim, and the chairman of Parliament a Shiite Muslim. When this system was instituted it was believed that this political structure corresponded to the size of the particular religious communities. With the passage of time the number of Muslims has increased, but the established proportions of representation in governmental bodies have not been altered. Moreover, the Christian community became the most prosperous part of the population, controlling the economy, trade, finance, and the armed forces.

The confessional contradictions, which are closely intertwined with social class contradictions, created a favorable situation for subversive activity in Lebanon by imperialist and Israeli agents working through internal reactionaries.

Organizations of the Palestine Resistance Movement are active in Lebanon. This fact has been used by Israel numerous times as a pretext for repeated attacks on Lebanon.

The Lebanese crisis which occurred in 1975 was a result of the unsettled nature of the Arab-Israeli conflict and the conspiracy among imperialism, Zionism, and reaction. Armed clashes with the Palestinians, begun on 13 April 1975 by the right-wing Christian Party Cataib, which protects the interests of the bourgeoisie and feudal lords, engulfed all of Lebanon and split the country into two opposing camps: on the one hand were the right-wing Christian forces supported by top army leaders, while on the other were the National Patriotic Forces and detachments of the Palestine Resistance Movement. The foreign press has reported that more than 63,000 people were killed, more than 217,000 wounded, and 170,000 suffered other losses from military actions during the 19-month civil war in Lebanon. Many cities and villages were destroyed and 30 percent of the country's industrial enterprises were closed down. The loss inflicted by the war is estimated at 7.5 billion Lebanese pounds. Armed struggle stopped for the most part after "inter-Arab security forces" were brought into Lebanon in conformity with decisions made at summit conferences of the Arab countries in Riyadh and Cairo in October 1976. The bulk of the troops, 20,000 out of a total of 30,000, in the country were Syrian.

In August 1977 a three-party Lebanese-Syrian-Palestinian meeting in Shtor reached agreement on a program to implement by stages the still unfulfilled points of the 1969 Cairo agreement regulating the presence of Palestine Resistance Movement formations in Lebanon. It was contemplated that subunits of the Palestine Resistance Movement would be withdrawn 15 kilometers away from the Lebanese-Israeli border and the Lebanese Army, which was being rebuilt, would be assigned to patrol

FOR OFFICIAL USE ONLY

and guard the border. This turn of events plainly did not suit Israel. On 13 March 1978 Israeli tank and mechanized units invaded Lebanon along the entire length of the Lebanese-Israeli border and occupied Lebanese territory up to the Litani River. More than 1,300 Lebanese and Palestinians died as the result of the aggressor's actions. On 19 March 1978 the U. N. Security Council adopted a resolution calling on Israel to immediately stop military actions against Lebanon and withdraw its troops from all Lebanese territory. The U. N. force sent by the Security Council to keep peace in Lebanon included 4,000 men from troop contingents of Nepal, Norway, France, and Iran.

Israel was forced to withdraw its troops from Southern Lebanon in the middle of June, but it took steps to split Lebanon and create a "buffer" zone controlled by the right-wing Christians along Israeli borders. That was why the Israelis turned over key positions in Southern Lebanon not to the extraordinary U. N. forces but to right-wing Christian detachments who refused to acknowledge the authority of the Lebanese Government. We are speaking of a strip of Lebanese territory about 10 kilometers wide which the Israeli leaders have declared to be a "security belt" which they do not intend to let out of their control under any circumstances. A conference of the foreign affairs ministers of Lebanon, Syria, Kuwait, Saudi Arabia, the United Arab Emirates, Qatar, and Sudan, held in mid-October 1978 in the Lebanese city of Beit-al-Din, adopted a declaration contemplating strengthening the authority of the central government in Lebanon, disarming all illegal formations and factions, restoring the country's national army, and prosecuting persons who cooperate with Israeli forces.

The events in Lebanon show what can result from complicity with an aggressor. It was indeed comprehensive U. S. support and American military aid that helped whet Tel Aviv's appetite for aggression. It is public knowledge that while the United States allocated about 4.4 billion dollars to Israel in the period between 1 June 1975 and 1 October 1977, for the next fiscal year Tel Aviv asked Washington to raise aid to 2.3 billion dollars and to guarantee delivery of the latest American weapons. In the opinion of foreign military specialists, in the present situation the Israelis with their "jam-packed military warehouses and growing military industry can wage and win a war against the Arabs without counting on American air delivery of desperately needed ammunition and weapons, as was the case in 1973." In the time that has passed since 1973, Americans say, Israel has modernized its armed forces to a much greater degree than any Arab states. With American aid Israel has built its own guided missile, the new Merkava tank, fast patrol boats, and several models of rifles.

The London journal MIDDLE EAST, analyzing the condition of the Israeli Armed Forces, reported in September of last year that Israel could mobilize 400,000 persons in case of war. The Israeli Armed Forces now have about 600 fighting planes, almost 3,000 tanks, and more than 3,000 armored personnel carriers. Measures carried out since the Arab-Israeli War of 1973 make it possible today to completely mobilize

FOR OFFICIAL USE ONLY

FOR OFFICIAL USE ONLY

Israeli forces in 48 hours and units on the borders can be mobilized in 36 hours.

It is not accidental that the United States openly declares that Israel remains the chief outpost of American imperialist policy in the Middle East, and recently in Africa too. The United States is trying to bring Israel and the Arab and African reactionaries closer together in order to direct them both against the national liberation movement and progressive forces both in the Middle East and on the African continent.

Recent events in Africa show that Arab reactionaries are already involved there in suppressing the national liberation movement. Generous financial support from the oil millionaires of the Arabian Peninsula, deliveries of weapons to the Somali aggressors, and finally, sending troop contingents to Zaire were all preplanned operations whose objective was to draw the Arab countries into a snare set out by the imperialists.

The purveyor of American policy in the Middle East, alongside Israel, is Saudi Arabia. The ruling circles of this oil-rich country (petroleum extraction in 1977 was 453 million tons) are directly dependent on the support of imperialist forces, to whom they have many ties. Saudi Arabia received roughly 40 billion dollars from oil sales in 1977. It cannot "digest" such amounts and is investing it abroad. The ruling circles of Saudi Arabia have become closely tied up with American monopoly capitalists. Saudi Arabia spends billions of dollars in the West for weapons and technical military equipment. In 1976 expenditures for weapons reached 7 billion dollars. The Americans are also drawing the United Arab Emirates into the arms race. Because Saudi Arabia does not have its own regular military cadres to handle the highly complex types of military equipment, it is forced to maintain several thousand foreign military advisors and specialists, most of them Americans.

Alongside the build-up of the Saudi Arabian military arsenal, which Western experts consider to far exceed the country's national defense needs, the direct American military presence in the Persian Gulf region is growing. According to reports in the foreign press, the United States has received the right to make active use of military bases in Bahrein and on Masira Island in Oman.

The preservation of a regime friendly to Washington in Saudi Arabia and control over the receipt of petroleum are one of the foundations of American strategy in the Middle East. Saudi Arabia and the United States are bound by a bilateral agreement whose military articles remain secret.

It is common knowledge that the reactionary Arab regimes, with U. S. support, are trying to create tension in the southern part of the Arabian Peninsula. The President of the Yemen Arab Republic al-Ghashmi was killed as a result of the provocation and with direct

FOR OFFICIAL USE ONLY

participation by the reactionary regimes. The attempt at a coup d'etat in the People's Democratic Republic of Yemen made by Salim Rubay'i Ali on 26 June 1978 pursued the same goal. The purpose of the conspiracy was to provoke fratricidal war between the Yemen Arab Republic and the People's Democratic Republic of Yemen and eliminate progressive transformations that have been carried out in democratic Yemen.

After the failure of the conspiracy an extraordinary session of the Council of the Arab League was called in Cairo under pressure from Saudi Arabia and Egypt. Algeria, Iraq, Libya, the People's Democratic Republic of Yemen, Syria, and the Palestine Liberation Organization refused to take part and the Republic of Djibouti was not represented. The session passed an incompetent resolution: to freeze all political and diplomatic relations between Arab League members and the People's Democratic Republic of Yemen and to stop cultural and economic relations with it and the granting of technical aid.

According to reports in the Arab press, the imperialist propaganda against Democratic Yemen is a preplanned action. Reactionary Arab states have not renounced their aggressive designs in relation to South Yemen. The reactionaries are especially alarmed by formation of the ruling Yemen Socialist Party, which has proclaimed a program of progressive socioeconomic transformations in the People's Democratic Republic of Yemen.

Thus, the situation in the Middle East continues tense. Washington and Tel Aviv, coordinating their actions, are trying to distract the Arab countries from their primary objective, the struggle to remove the consequences of Israeli aggression. Taking advantage of the hopeless situation of Sadat, who is following a policy that betrays the interests of the Arab peoples, the United States now intends to establish itself openly in this region. This was precisely the goal of the three-party meeting of Egyptian President Sadat, Israeli Prime Minister Begin, and U. S. President Carter held on 6-17 September 1978 at Camp David, near Washington. The protracted talks concluded with adoption of two documents: "Framework for Conclusion of a Peace Treaty Between Egypt and Israel" and "Framework of Peace in the Middle East."

From the first document it is clear that although Israel does promise to withdraw its occupation forces from the Sinai Peninsula by stages after conclusion of a peace treaty, even then Egypt will not receive the right to full sovereignty over the Sinai.

The problem of the occupied Palestinian territories and other Arab regions is the basis of the second document. Israel refused to agree to grant sovereignty to the West Bank of the River Jordan and the Gaza strip, thus blocking the opportunity to establish a separate Palestinian State. Prime Minister Begin said bluntly that Israel intends to keep its military presence in these regions during the five-year transitional period stipulated in the Camp David documents. He said further that Israel will never give the Golan Heights back to Syria and that Jerusalem will be the capital of Israel "as long as the Jewish people exist."

FOR OFFICIAL USE ONLY

The negotiations in Camp David are a deal made behind the backs of the Arab peoples and mainly suit the interests of Israel, American imperialism, and Arab reactionaries. The separate deal did not resolve a single basic problem of the Middle Eastern settlement; on the contrary, it made a settlement even more difficult to achieve. The intention is perfectly obvious: split the Arabs, pit one against another, and impose settlement conditions suitable to the aggressor on the countries individually.

No matter what "framework" the separate deal may be clothed in, it covers up the capitulation of one side and secures the fruits of aggression for the other, for Israel; such a deal can only make the situation in the Middle East even more explosive. This is a new anti-Arab deal between Israel and Egypt, worked out with the active participation of Washington.

It is no accident that this separate deal made at Camp David aroused determined protest in the Arab world. The members of the Front of Resistance and Counteraction to the Capitulationist Policy of Sadat (Syria, Algeria, Libya, Democratic Yemen, and the leaders of the PLO) adopted a decision to break diplomatic relations with Egypt and impose an economic boycott on it. In addition, they will try to get the headquarters of the Arab League moved away from Cairo.

As for the Soviet Union, it has always been and remains an advocate of an effective, all-encompassing settlement in the Middle East, a settlement which would meet the true and long-run interests of all the countries and peoples of this region. As General Secretary of the CPSU Central Committee, Chairman of the Presidium of the USSR Supreme Soviet Comrade L. I. Brezhnev emphasized in his talk in Baku, "Long years of experience prove irrefutably that there is only one way to truly resolve the Middle Eastern conflict. This is complete liberation of all Arab lands occupied by Israel in 1957, complete and unambiguous respect for the legal rights of the Arab people of Palestine, including the right to establish their own independent state, and insuring reliably guaranteed security for all countries of the region, including, of course, Israel. Such an all-embracing settlement is possible only with the participation of all interested countries, including the Palestine Liberation Organization. And the sooner this settlement is achieved, the sooner the Middle East will cease to be a center of tensions."

COPYRIGHT: "Zarubezhnoye voyennoye obozreniye", 1978

11,176
CSO: 1801

FOR OFFICIAL USE ONLY

COMMENTS ON U. S. NONCOMMISSIONED OFFICERS IN EUROPE

Moscow ZARUBEZHNOYE VOYENNOYE OBOZRENIYE in Russian No 11, Nov 78
signed to press 3 Oct 78 pp 15-20

[Article by Maj A. Chekulayev: "The Noncommissioned Officer Contingent
of American Forces in Europe"]

[Text] The constructive and consistent policy of the Soviet Union aimed at successful implementation of the program worked out by the 25th CPSU Congress to continue the struggle for international peace and security, against the arms race, for consolidation of detente, and for international cooperation is finding support among hundreds of millions of people on all continents. However, the ruling circles of the imperialist countries, above all the United States, are continuing to take steps whose purpose is to increase tension in Europe and build up military potential in this part of the world.

Among these steps is the constant increase in the number of American troops in Europe and supplying them with the latest types of weapons and combat equipment. The Pentagon devotes special attention here to personnel matters, and one issue is enlarging the role of NCO's.

After the end of the war in Vietnam and the transition in the U. S. Armed Forces to voluntary enlistment the American command stepped up its work on the selection, training, and indoctrination of NCO's. In the American Army today NCO's and specialists are the largest contingent of personnel. The combat readiness of the armed forces as a whole depends to a definite degree on their level of training and practical skills. According to figures in the American press, NCO's constituted 54.9 percent of all military personnel in 1973, 60.2 in 1974, 60.4 in 1975, 61.7 in 1976, and were planned to be 62 percent in 1977. The Pentagon leadership believes that sergeants play an important part in unifying small subunits, training personnel, maintaining strict discipline, and insuring close checks on the political attitudes and behavior of subordinates.

The entire system established in the U. S. Armed Forces for recruitment, service, and the training and retraining of NCO's aims at

FOR OFFICIAL USE ONLY

FOR OFFICIAL USE ONLY

careful, thorough selection of this category of American servicemen, However, in the opinion of military leaders, this process is even more important among American forces in Europe. Therefore, they are staffed primarily with NCO's and technical specialists who have a high level of military and specialized training and have been educated at schools for sergeants in the United States.

At these schools training is offered in virtually all the 480 basic military occupational specialties of the U. S. Army. The length of study is 4-6 weeks depending on the future specialty.

NCO's for American forces stationed on the European continent are trained at the school for sergeants of the U. S. ground forces in Europe (Bad-Tölz, West Germany) where up to 370 servicemen are trained each year. The course of training is figured to last five weeks (249 training hours). Candidates with good references from their immediate commanders go before a special commission which pays special attention to their political "reliability" and devotion to the system existing in the United States. This commission decides if they will be sent to a school.

The system of training is organized so that future NCO's specialize in the field they have chosen and acquire the necessary practical skills in training and indoctrinating subordinates. For this purpose they learn to organize and conduct training periods with soldiers in the particular discipline, to form correct mutual relations with subordinates, and to exert proper influence on them.

Military counterintelligence, FBI agents, the military police, and other organizations participate in checking the political "reliability" of NCO's being sent to serve in Europe.

The established procedures for promotion and receiving ranks also promote careful and thorough selection of sergeants. To receive the rank of "corporal," the first NCO rank, privates first class must go through a corresponding course of training, pass a test in the specialty, and demonstrate their ability to perform service duties established by U. S. Army manuals and regulations in practice. During the taking of examinations the loyalty of sergeant candidates with respect to the existing order and their political convictions are checked.

A distinctive feature of American military personnel in Europe is the trend observed in recent years toward an increase in the number of higher NCO's with a reduction in the number of corporals. According to figures in the foreign press, servicemen with the rank of "sergeant" and "staff sergeant" constitute approximately 75 percent of the NCO's in U. S. ground forces in Europe.

The American command tries to strengthen its NCO element, develop their interest in the service, and increase the authority of sergeants by every means. On 4 July 1966 the position of command sergeant major was

FOR OFFICIAL USE ONLY

The Pentagon has taken certain steps in recent years to increase the effectiveness of sergeant training. Specifically, the syllabi at the school in Bad Tölz and at retraining courses have been revised and new short courses organized for various categories of NCO's and specialists. The new syllabi put special emphasis on mastering leadership techniques and the ability to solve moral and emotional problems.

In late 1976 the headquarters of U. S. ground forces in Europe approved a new four-week retraining program for sergeants at schools in the divisions. In the first week the servicemen study how to lead a squad or platoon. The second and third weeks are devoted to field training periods, and the last week is allocated for political training periods and the study of military administration, equipment, the tactics of small subunits and other subjects.

Once a year the NCO personnel of U. S. Armed Forces in Europe are tested in their military occupational specialty. This involves an oral exam and a written exam. An evaluation of "high," "normal," or "low" is given on the basis of the results of the two tests. This score is considered in determining the serviceman's pay and considering him for promotion. Persons with the rank of staff sergeant or higher are required to pass examinations in a related military occupational specialty; these examinations are given once every two years. For command sergeant majors these examinations were abolished on 1 January 1976.

Ideological indoctrination occupies a central place in the system of training for NCO's, as it does for all American military personnel in Europe. The command of U. S. ground forces in Europe attaches great importance to increasing the effectiveness of the sergeants' ideological influence on enlisted men. The American military press has observed many times that in current conditions sergeants must take more responsibility than before for the morale of their subordinates; they must have the same leadership effectiveness and propaganda activism as officers do.

The enormous progress made by the Soviet Union and the other socialist countries in peaceful building and the spread of communist ideas among the working people of the world force the American command to employ considerable resources for propagandizing anticommunism and anti-Sovietism and instilling hatred of the USSR and the other socialist countries in the hope of neutralizing the infiltration of progressive ideas into the barracks. The core of anticommunist propaganda among NCO's is the myth of the "communist peril" which supposedly threatens the Western world and the "desire of communism to eliminate the capitalist system by force."

One of the lines of ideological indoctrination of sergeants is instilling them with devotion to the capitalist system existing in the United States. All personnel are required to maintain loyalty to the principles of American "democracy" and to the military oath and to obey officers. However, sergeants are expected to show not only personal devotion and carry out all orders without question, but also teach these qualities to their subordinates.

FOR OFFICIAL USE ONLY

introduced in the headquarters of the branches of the armed forces by decision of the Pentagon. At the same time the position of command sergeant major was introduced for armed forces commands, armies, corps, divisions, brigades, and battalions and for training centers and schools involved with training and retraining military cadres.

The "Manual for Sergeant" states, "The command sergeant major is the senior sergeant in the battalion, brigade, division, and other higher instances. He monitors performance of duties by the first sergeants of subordinate units and subunits."

The command sergeant major holds meetings for NCO's on questions of combat training, rules of behavior, discipline, hygiene, and work procedures. He gives the commander recommendations on questions of appointments, promotions, allocation of leaves, imposing punishment, and announcing commendations for enlisted men and NCO's. The command sergeant major participates in inspections of subordinate units and subunits, explains the instructions of the commander on whose behalf he works, and gives appropriate orders.

At the beginning of 1973 a school was opened at Fort Bliss, Texas to train command sergeant majors. It is the only school in the U. S. Armed Forces to which sergeants from all the regional U. S. commands, including American forces in Europe, are sent. This is the top school in the system for training NCO's. The American press calls it the "war college for sergeants."

The system of selecting and training command sergeant majors is expected to preclude the admission of democratically minded people, people who work in progressive organizations, those suspected of disloyalty to the social system existing in the United States, and people who have expressed dissatisfaction with the army way of life.

American propaganda tries to present the command sergeant major as the "connecting link between the commander and the enlisted man" or the "democratizing factor in the army" and calls the command sergeant majors themselves "full-fledged representatives of the common soldiers" and "defenders" of their interests. In reality, the command uses them to exercise influence on the common soldiers and keeps them obedient by creating nothing but the appearance of "democratization" of the army.

A far-flung network of retraining courses, assemblies, and various special training periods is used extensively in the U. S. Armed Forces to improve the professional training of NCO's. Each year about 4,000 sergeants are retrained at Bad Tölz and up to 3,000 go through retraining courses for NCO's in divisions. In 4-5 weeks they polish their command skills, familiarize themselves with new weapons and combat equipment, and study forms of ideological indoctrination of subordinates.

FOR OFFICIAL USE ONLY

The foundation of this aspect of indoctrination is exalting the illusory "advantages" of what is called the "American way of life" and "American democracy," which U. S. servicemen are supposed to defend.

The ideological indoctrination apparatus of American forces in Europe, relying on sergeants and using their direct contacts with personnel, implant a spirit of militarism in servicemen. It is founded on propaganda for war against the Soviet Union and the other countries of the socialist community.

The thesis of "Atlantic solidarity" occupies a significant place in militaristic propaganda. The NCO's of American forces in Europe participate in activities of the so-called "partnership program" which determines the content and form of cooperation with different categories of servicemen in the NATO armies and actively fosters the organization and conduct of joint exercises, firing, sporting events, and the like.

The information department of U. S. ground forces in Europe has developed and is following a special program that obligates all servicemen to study the language of the country in which they are serving. For sergeants, specifically those with the rank of staff sergeant and lower, a language training course lasting 40 hours has been instituted and they must take it within 30 days of arrival in Europe. Thirty hours are allocated exclusively for the language program and 10 hours are used for familiarization with the culture and history of the host country. Sergeants 1st class and higher study in a 40-hour program that envisions only language study.

Propaganda for the traditions of the U. S. Armed Forces occupies a significant place in the ideological indoctrination of sergeants. It became particularly broad in scope during celebration of the 200th anniversary of the army and 200th anniversary of the formation of the United States. Sergeants who are veterans of World War II and the wars in Korea and Vietnam are widely honored. Servicemen who took part in combat in Vietnam exercise a considerable influence on the political attitudes and morale of all enlisted and NCO personnel. According to the testimony of the foreign press, about half of the sergeants in the ground forces command and 40 percent of the U. S. Air Force sergeants in Europe have combat experience gained in fighting against the people's patriotic forces of South Vietnam.

Religious propaganda also plays an important role in moral-psychological training. The American command in Europe considers "obedience to God" an important moral stimulus and tries to use the fact that most sergeants are prisoners of the narcotic of religion. According to a survey conducted by the newspaper ARMY TIMES, 87.1 percent of the sergeants are believers (out of 1,900 servicemen surveyed). More than 17 percent of those surveyed attend church activities regularly.

Mass information media are used vigorously in ideological indoctrination of NCO's. Propaganda for the work of the most experienced sergeants in training subordinates and raising their professional skill level occupies

FOR OFFICIAL USE ONLY

a significant place in the radio and television broadcasts of American forces in Europe.

So-called sergeants "days" and "weeks" are held regularly in American units and subunits stationed on the European continent, and 1976 was proclaimed the "year of the sergeant" in U. S. ground forces in Europe. During such events NCO's are given the right to command platoons, companies, and battalions. The temporary transfer of power in the subunits to them is purely superficial, because the corresponding officers are on the spot and exercise actual leadership. Nonetheless, the American command gives such activities broad publicity. These things are done for several purposes: for one, to raise the prestige and authority of NCO's; for two, to develop in them certain skills in leading subunits; and for three, to instill American servicemen with the idea of supposed "democracy" in the army.

The appointment of sergeants to officer positions is done for the same reason. Thus, officer positions as chiefs of NCO retraining schools, chiefs of rifle training grounds, officer responsible for the safety of practice firing, and others are transferred to sergeants.

The transition to voluntary recruitment, the system of moral and material incentive, and extended periods of service in the army helped to shape the political and class self-consciousness of sergeants and in large degree make them active spokesmen for the political goals of imperialism's military preparations.

Of course, not all sergeants accept anticommunist dogmas and stereotypes on faith. Some of them are beginning to understand that in the situation of a campaign for detente there is no need whatsoever for American troops to be present in Europe with the supposed mission of "defending Western civilization against aggression from the East." Some NCO's are influenced by the peace-loving policy of the USSR and its allies, aimed at eliminating military confrontation and development of mutually advantageous relations with capitalist states based on principles of peaceful co-existence influences a certain number of NCO's.

The American forces in Europe also have class and racial contradictions caused primarily by the very structure of the U. S. Armed Forces. The officers of the American Army in Europe differ from the sergeants by social origin, education, and service opportunities and therefore take a haughty and negligent attitude toward them. Some of the sergeants are expressing discontent with the fact that the officers assign some of their functional duties to NCO's, do not want to go into the problems that concern their subordinates. "Discipline among the troops could be much better if the officers came down off their pedestals and tried to understand how personnel live," remarked the newspaper STARS AND STRIPES.

The existence of nationality and racial contradictions resulted from the policy followed by the American command in relation to Black sergeants and representatives of other ethnic groups. The position of

FOR OFFICIAL USE ONLY

Black soldiers, who make up four percent of all NCO's in U. S. ground forces in Europe is made more difficult by the fact that not just White officers and sergeants, but also subordinates, are causal with them.

The moral fiber of this category of servicemen is also shown by the steady rise in alcoholism and drug addiction. According to official figures for the medical commission of the U. S. ground forces in Europe which is studying the prevention of alcoholism in formations and units, 36 percent of NCO's (the group from staff sergeant to command sergeant major) used strong alcoholic beverages excessively.

It is observed in the Western press that a significant share of the crime committed by American sergeants is committed by the drug addicts and alcoholics. A whole range of steps, beginning with prevention and ending with harsh disciplinary measures, is being taken to reduce the spread of drug addiction and alcoholism among NCO's; the military police, specially trained agents, and paid informers participate in this program. However, the battle against drug addiction and alcoholism is made more difficult by the fact that many sergeants who went through the war in Vietnam used drugs and alcohol together with their subordinates and engaged in the sale and distribution of narcotics among American servicemen.

The deviant political views and attitudes of sergeants, the existence of class and racial contradictions in this service category, crimes, and amoral behavior definitely diminish their political-moral level. However, the U. S. Army command estimates that on the whole these phenomena do not have a decisive effect on the fighting effectiveness of American forces in Europe. This is owing to careful selection, more intensive training and ideological indoctrination of NCO's, and material incentives for work; this ultimately makes sergeants a reliable support for the American command in performing the military-political missions of U. S. imperialism.

COPYRIGHT: "Zarubezhnoye voyennoye obozreniye", 1978

11,176
CSO: 1801

FOR OFFICIAL USE ONLY

COMMENTS ON OFFENSIVE OPERATIONS ON A U. S. ARMY CORPS

Moscow ZARUBEZHNOYE VOYENNOYE OBOZRENIYE in Russian No 11, Nov 78
signed to press 3 Oct 78 pp 21-27

[Article by Col A. Ryzhkov, candidate of military sciences, docent:
"The U. S. Army Corps on the Offensive"]

[Text] There are still influential forces in the United States and the other imperialist countries who have not renounced their criminal plans to unleash nuclear warfare. They are to blame for the fact that the arms race is continuing, that military budgets increase each year, the production of weapons and military equipment is expanding, and troop combat training is being steadily improved.

Within the overall system of preparation of the armed forces for a future war against the USSR and the other socialist countries the leadership of the U. S. Army devotes great attention to the organization and conduct of offensive actions. American military specialists consider the offensive one of the primary types of engagement or operation. The essential feature of the offensive is reliably hitting the enemy with all types of weapons, including nuclear weapons, and swiftly moving formations and units to the depth of the enemy deployment in order to capture or wipe out men, weapons, and equipment and to take vitally important enemy regions and objects.

As the foreign military press observes, the U. S. Army corps, the highest tactical formation in a theater of action, plays a significant role in the operations of ground forces and may form the basis of a coalition group of armies.

The army corps has significant fire and striking power. Because it combines the primary arms of troops, it has its own essential means of combat and logistic support, which makes it possible for the corps to fight not only within a group of armies but also in an independent operational sector or cut off from the main forces.

The role of the army corps in an offensive operation is determined by its designation and place in the operational structure of the coalition

FOR OFFICIAL USE ONLY

FOR OFFICIAL USE ONLY

group of armies. Thus, when operating in the first echelon in the axis of the main thrust, it may play an important part in achieving the objective of the offensive operation of a group of armies. This is explained by the fact that at the beginning of a war, for example, this group will usually go over to the offensive in a single-echelon formation, holding several divisions in reserve. During the course of the offensive operations these divisions are to be made subordinate to the army corps operating in the main axis and, after receiving fresh formations and units, are capable of performing missions to the full depth of the offensive operation of a group of armies. In the sector of the subsidiary strike the army corps performs a mission in support of the actions of the main grouping of forces.

In the offensive, foreign military specialists believe, the army corps will usually be given decisive objectives: smash an opposed grouping, seize territory or key terrain sectors, deprive the enemy of essential resources, demoralize the defending troops and reduce their will to continue resistance, and distract the enemy's attention from other regions of combat actions. Offensive actions may also be carried out for limited objectives such as pinning down enemy reserves, thwarting an enemy offensive, breaking out of encirclement, and releasing friendly troops from encirclement.

According to the views of the U. S. command, the success of the units and formations of a corps in an offensive engagement will depend largely on meeting the following conditions: concentration of the necessary men and equipment at the decisive point at the decisive moment; insuring reliable command and control in the interests of focusing fire efforts and maneuvering in the important sectors; taking and keeping the initiative through the combined efforts of all arms of troops in order to achieve maximum effectiveness of friendly weapons and reduce the effectiveness of enemy fire weapons. In an offensive where nuclear weapons are not used, U. S. Army manuals recommend creating a superiority of at least 6:1 over the defenders in the breakthrough sectors and delivering the main thrust at the most vulnerable points in the enemy's system of defense. The main factors that make possible the necessary superiority over the enemy are surprise, striking power, and speed of actions.

Foreign experts do not consider it necessary to create a significant superiority over defenders in men and equipment if nuclear weapons are used in the offensive. In some cases it is even possible to go over to the offensive with an even ratio of forces. It is recommended that tactical superiority over the enemy in the main sector be achieved by skillful use of nuclear weapons against the enemy's most important targets.

The foreign press attaches great importance to the surprise factor. It is assumed that an enemy who is caught unprepared or completely taken by surprise cannot offer proper resistance, even if he has superior forces. It is recommended, therefore, that small forces make maximum

FOR OFFICIAL USE ONLY

use of the surprise factor to create superiority over the enemy, and that this be done by the measures to confuse him and by taking advantage of the high mobility of friendly troops.

The combat composition of the corps is not fixed and depends on its role and place in the operational structure of the group of armies, the combat missions facing them, terrain conditions, and the position and nature of actions of the enemy. The corps may include from two (in a subsidiary axis) to six different types of divisions as well as support and rear service units and subunits.

At the beginning of the war an army corps may go over to the offensive with those resources that it has at the start of combat actions.

The combat missions and scope of operation of the army corps depend on many factors, above all on the mission of the group of armies, the designation and composition of the corps, the nature of actions by the enemy, and terrain conditions.

Foreign military specialists believe that an army corps operating in the sector of the main thrust may be given an attack zone 40-80 kilometers wide; in a subsidiary axis the width may be 120 kilometers and more (see illustration below). The depth of the immediate objective is 35-40 kilometers and the final objective is 100-150 kilometers deep with a total duration of 3-4 days for the operation. The rate of advance where nuclear weapons are not used can be 40-50 kilometers a day.

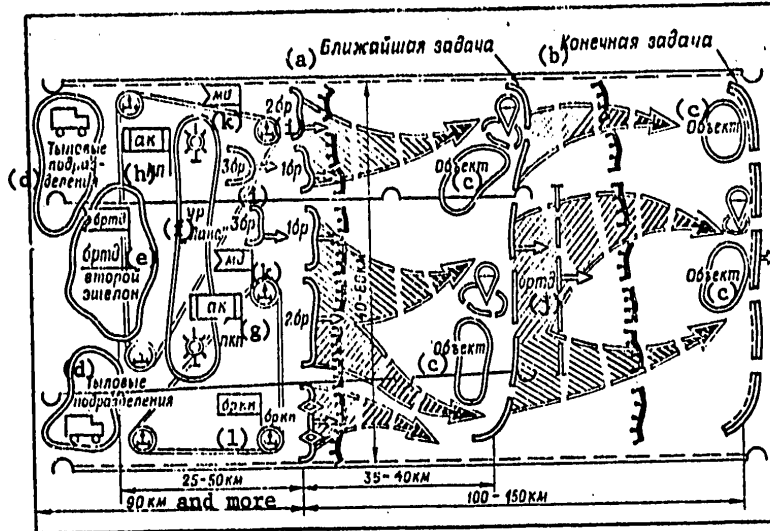
When the army corps has 5-6 divisions it can wage combat actions on a broader front (up to 130 kilometers) and perform missions at depths of as much as 250 kilometers. These are approximate values. It is believed that corps missions should be given in general terms so that commanders will have maximum flexibility and freedom of action. In the opinion of American experts, specific attack objectives should be avoided because this leads to restricting initiative and deprives corps commanders and staffs of freedom of action.

It is recommended that the battle formation of the army corps on the offensive be constructed with due regard for the possibility of efficiently using the results of nuclear and conventional strikes, broad maneuvering in the interests of concentrating forces for the breakthrough, and rapid dispersal of forces to defend against weapons of mass destruction. A strong first echelon is envisioned to inflict a blow at the very beginning of the offensive. Specialists recommend that an assault group (the main thrust), auxiliary thrust groupings (up to two), and a reserve (second echelon) be formed among the troops of the corps.

The elements of the corps battle formation are the first echelon, the combined arms reserve (second echelon), an airborne (air mobile) assault group, cover troops, groupings of corps field and antiaircraft

FOR OFFICIAL USE ONLY

Construction of the Battle Formation and Missions of the U. S. Army Corps on the Offensive (variation)



- Key:
- a) First Objective;
 - b) Final Objective;
 - c) Objective;
 - d) Rear Subunits;
 - e) Armor (tank) Division -- Second Echelon;
 - f) Lance Guided Missiles;
 - g) Forward Command Post, Army Corps;
 - h) Command Post, Army Corps;
 - i) [Russian abbreviation represents "brigade" with appropriate number];
 - j) Armor (tank) Division;
 - k) Mechanized Division;
 - l) Armored Cavalry Regiment.

artillery, and special reserves (fire weapons, antitank, engineer, and chemical).

The U. S. Army corps, the foreign press emphasizes, usually constructs its battle formation in two echelons: 2-3 mechanized divisions in the first echelon and an armor division and an armored cavalry regiment in the second. It is also recommended that an armor division be used in the first echelon in the axis of the main thrust. The primary objective of the first echelon will be to break through the tactical zone of enemy defense and accomplish the corps' first objective; after this, in cooperation with the second echelon, it also accomplishes the final objective. The second echelon is designed to develop the success, replace

FOR OFFICIAL USE ONLY

FOR OFFICIAL USE ONLY

formations that have suffered large losses, ward off counterattacks and counterstrikes, and accomplish the final objective in cooperation with first-echelon formations.

The armored cavalry regiment may operate independently in an auxiliary axis, carry on reconnaissance, or cover open flanks and gaps in the battle formation. When the offensive is carried out without direct contact with the enemy it is contemplated that the regiment will be used as corps cover troops.

When the corps battle formation is constructed in one echelon, the armored cavalry regiment and detached brigade, if there is one in the corps, may be assigned to the combined arms reserve. The reserve formations and units of the army corps are usually located 25-50 kilometers from the forward edge.

The airborne (air mobile) assault party used in the zone of attack of the army corps may be up to a brigade in strength. Its subunits are usually allocated from the second-echelon (reserve) formations and units. The primary objective of the assault party is to wipe out nuclear weapons and control posts and take advantageous lines and regions in enemy territory and hold them until friendly troops approach from the front. Before the beginning of the landing operation the assault subunits are located behind the second-echelon divisions.

The grouping of corps field artillery usually includes Lance guided missile battalions and some of the field artillery subunits left at the disposal of the corps commander. During the period of preparatory fire and general support of the offensive of the first-echelon formations in the primary sector the corps commander may bring in division artillery or the artillery of other units located in the second echelon (reserve) of the corps.

The antiaircraft artillery grouping includes Hawk antiaircraft guided missiles in addition to regular corps weapons. The commander determines the most important targets and order of covering them in the corps zone of operations and direct fire control is carried out according to a uniform system in the air defense zone. The chief objects to be covered are nuclear weapons, the formations of the assault grouping and reserve, and command and control posts.

The antitank reserve of the army corps is designed to reinforce the antitank capabilities of first-echelon formation and repulse counterattacks and counterstrikes independently during the offensive. It is composed primarily of fire support helicopter subunits.

The engineer reserve of the corps performs jobs to strengthen the first-echelon formations, clean up after nuclear weapons, cover open flanks, and the like. It may consist of sapper, pontoon-bridge, and other engineer subunits.

FOR OFFICIAL USE ONLY

The corps chemical reserve is used to lay down camouflage and toxic smokes and clean up after nuclear attacks. It usually includes smoke subunits and antichemical defense and special treatment subunits.

All the special reserves are located behind the battle formations of the corps' first-echelon formations in the sectors of their probable use.

The nuclear weapons remaining at the disposal of the commander after distribution among the formations are an important reserve of the army corps. The commander may use this reserve to influence the course of battle by allocating nuclear ammunition to the first-echelon formations and reserve.

According to the views of the U. S. Army command, offensive actions by formations of the ground forces are composed of the following stages: approach, attack proper (breakthrough), development of the success, and pursuit.

The approach is carried out for the attacker to come into direct contact with the enemy or to re-establish direct contact. One of the requirements for the approach is concealed forward movement. The approach to the enemy should be carried out in such a way that the first fighting engagement with the enemy is made by small forces, especially when the enemy's system of defense has not yet been clearly identified. During the approach, therefore, the formations of the corps advance by echelon in march and approach march formation, maintaining reconnaissance, cover, and security forces in front.

It is believed that such actions will be most typical at the beginning of a war and when attacking from the march. In this case, the armored cavalry regiment may operate as the cover force for the army corps. It is given the following missions: carry on active reconnaissance, cross the security zone, break through to the forward edge of the main (first) zone of defense, and support the advance and deployment of the main forces of the corps. The combat actions of cover troops will be supported by the fire of field artillery allocated from the main forces of the corps and put directly at their disposal and strikes by support aviation and fire support helicopters.

The attack proper (breakthrough) includes concentration of men and equipment in the chosen sectors, suppression of the defender's fire weapons (preparatory fire and support of the attack), delivering the strike, and suppression-destruction of the enemy. U. S. military specialists envision two methods of going over to the attack: from the march and from a position of direct contact with the enemy.

In the first case troops advance from the depth directly to the starting line for the attack and move into the engagement either from the march or from assembly regions occupied for a short time beforehand and located 60-80 kilometers from the front line. They leave these

FOR OFFICIAL USE ONLY

regions and move to the starting lines for the offensive. Entering combat from the march is most characteristic for the initial period of a war when attacking the enemy is a natural continuation of the approach. Attacking on the move from assembly regions is more characteristic when combat actions are already underway. It will be done most often under conditions of nuclear warfare and when the enemy has hastily switched to defense and is inferior to the attacker in fighting effectiveness, combat readiness, and mobility.

The offensive from a position of direct contact is the procedure where the line occupied by the troops is the starting place for the offensive. This procedure is usually used when the army corps is on defense and when attacking a prepared enemy defense, usually with the use of conventional weapons only.

A key condition for success in the engagement is considered to be concentration of the essential men and equipment in the chosen sectors in order to achieve the necessary superiority over the defenders. In combat using conventional weapons it is recommended that this superiority be created in a narrow sector of the front where the enemy defense is most weakly organized. It is envisioned that 60-80 percent of all the men and equipment of the corps will be concentrated in the chosen breakthrough sectors (8-12 kilometers long); this will, of course, weaken the grouping in other sectors.

The foreign press emphasizes that organizing such maneuvering demands great skill, intelligent risk-taking, secrecy, and operational ability from commanders and staff in order to achieve maximum surprise in going over to the offensive. It is recommended that all possible steps be taken to deprive the enemy of the possibility of carrying on reconnaissance, to confuse the enemy and limit his capabilities for troop control by extensive use of radio electronic means, and to use the terrain and camouflage skillfully.

Foreign military specialists believe that before divisions go over to the offensive there will be preparatory fire using all forces or only conventional weapons for the purpose of not only suppressing the enemy's defending troops but also to carry out maneuvers at this time with corps forces in order to create the assault groupings in the chosen axes (breakthrough sectors). In nuclear warfare the preparatory fire may last 20-30 minutes; in combat where nuclear weapons are not used it may be even longer.

Sixty percent and more of all corps artillery is concentrated in the sector of primary efforts when preparatory fire is carried on for an offensive without using nuclear weapons.

Massed bombing and ground-attack strikes by tactical aviation against targets not destroyed by field artillery, especially in the sector where the main efforts are concentrated, is an essential part of preparatory fire. Foreign specialists consider that these attacks may take place to a depth of 100 kilometers and more.

FOR OFFICIAL USE ONLY

Upon conclusion of preparatory fire the first-echelon formations of the army corps go over to the offensive, concentrating their primary efforts in the narrow breakthrough sectors. The corps commander influences the course of action with the fire of field artillery, supporting aviation, reserves, and other resources. Airborne (air mobile) landings and steps to repulse enemy counterattacks and counterstrikes are also envisioned to maintain a high rate of attack.

As the foreign press emphasizes, if the first-echelon troops suffer significant losses during the breakthrough and the rate of the offensive slows down, it is recommended that they be replaced by fresh forces to deepen the wedge and develop the success. It is envisioned that the second echelon will be introduced into the engagement after accomplishment of the first objective; its primary purpose will be to develop the success of the offensive. Under cover of supporting tactical and army aviation, with fire support, and coordinating actions with airborne assault groups it advances swiftly into the depth, not slowing down to wipe out surrounded enemy troops and attempting to encircle major centers of resistance. Foreign military specialists consider that commanders should not spread out forces being used to develop the success, but rather should keep them compact to maintain a high rate of advance. The formations and units participating in the breakthrough follow behind the forces that are developing the success. They broaden and reinforce the captured region, wipe out enemy forces remaining in the rear, and suppress pockets of enemy resistance.

When the attacking troops encounter strongly fortified lines or objects in the depth of the defense, it is recommended that they go around them; but when this is not possible they attack them after powerful strikes by artillery and tactical and army aviation. In the opinion of foreign specialists, while developing the success counterstrikes by operational reserves (depending on their composition) may be repulsed with nuclear weapons and strikes by troops on the whole or part of the forces may be used in position to maintain a high rate of advance.

The U. S. Army command considers pursuit the final phase of an offensive. Its primary purpose is to complete the rout of enemy forces. The pursuit usually begins when the defender is no longer able to hold his positions and tries to withdraw from the engagement. Pursuit is carried out on a broad front by sectors, with frontal and parallel pursuit organized in each of them.

After the first-echelon formations reach the line of the final objective the troops of the corps dig in in the captured regions (regardless of the kind of new combat mission they may receive).

COPYRIGHT: "Zarubezhnoye voyennoye obozreniye", 1978

11,176
CSO: 1801

FOR OFFICIAL USE ONLY

COMMENTS ON TANK DEVELOPMENT IN WESTERN COUNTRIES

Moscow ZARUBEZHNOYE VOYENNOYE OBOZRENIYE in Russian No 11, Nov 78
signed to press 3 Oct 78 pp 27-34

[Article by Col-Engr (Res) Yu. Kraynyuk: "Ways in Which Tanks Are Being Developed in the Capitalist Countries"]

[Text] The military leaders of the leading capitalist countries attach great importance to further quantitative and qualitative growth of armored tank forces, assigning them a special place in their aggressive preparations. In their assessment of the role of tanks in the system of armed forces of the NATO countries, foreign military specialists continue to consider them the main striking force of ground forces in future wars using both conventional and nuclear weapons.

Virtually all the capitalist countries engaged in the development and production of tanks are now carrying on research aimed at improving the combat performance of new, existing, and even obsolete tanks. This research is being carried out in conformity with plans for technical re-equipping of the capitalist armies which is expected to replace most of the tank fleets of ground forces in the 1980's with modernized and new tanks that are better suited to the requirements of waging modern combat. Moreover, since the early 1970's research has been done on designing so-called "fourth-generation" tanks. They should be expected to appear in roughly 1990-2000.

Judging by reports in the foreign press, certain lines of study have developed in the process of work by the capitalist countries to modernize existing tanks and build promising new ones. These developments involve a further increase in fire power, maneuverability, protective features, and operating reliability as well as a reduction in the cost of developing and purchasing tanks.

The increase in firepower during modernization and development of new tanks is accomplished by improving the primary weapon and ammunition, using integrated fire control systems, and improving the capabilities for target detection by the crew under day and night conditions. The choice by foreign specialists of the type of primary tank weapon is a

FOR OFFICIAL USE ONLY

FOR OFFICIAL USE ONLY

fundamental issue in increasing firepower. The technical rivalry among cannon, missile-cannon, and missile weapons that lasted abroad for more than 10 years ended with the triumph of the cannon weapon, which has a number of significant advantages: adequate fire effectiveness at ranges of 1,500-2,500 meters, universality, reliability, simplicity of servicing, and relatively low cost.

The missile-cannon weapon first built in the United States (a 152-millimeter gun-launcher that fired Shillelagh antitank missiles and conventional shells) and developed somewhat later in France and Japan did not receive wide distribution; further use of it is not contemplated. It proved complex in design, unreliable in operation, and very expensive, even though it is superior to the cannon in probability of a hit at great distances (3,000 meters and more). But because tanks will, in the opinion of foreign specialists, seldom fire at such ranges in the European and other military theaters, this advantage loses its importance. The American M6082 and M551 Sheridan tanks, equipped with missile-cannon weapons, were manufactured in small numbers (540 and 1,660 respectively).

At the same time, the question of the type (rifled or smooth-bore) and caliber of the cannon remains open. At the present time 105-millimeter rifled cannons are mounted on the primary tanks of most capitalist countries, and only the English Chieftan has a 120-millimeter gun. However, just recently a 120-millimeter smooth-bore cannon was developed in West Germany for the Leopard-2 tank, which is to be launched in series production at the end of 1979. Final development of a similar cannon for modernized and future tanks is also underway in France. Many foreign specialists believe that the 120-millimeter smooth-bore cannon can significantly increase tank firepower.

After lengthy comparative tests of the American 105-millimeter rifled cannon, the West German 120-millimeter smooth-bore cannon, and the English 120-millimeter rifled cannon, in early 1978 the U. S. military leadership adopted a decision to use the West German 120-millimeter smooth-bore cannon on the new XM1 tank in place of the 105-millimeter rifled gun beginning in the mid-1980's. The cannon will be manufactured in the United States on license. Only Great Britain of the leading capitalist countries intends to continue using a 120-millimeter rifled weapon on its modernized and new tanks.

Further refinement of the 105 and 120 millimeter rifled and 120-smooth bore cannons and ammunition for them is envisioned by: improvements in the technology for machining the internal surface of the barrels, more efficient composition; increasing muzzle velocities of the shells; using high-calorie powders and new, more stable materials for armor-piercing cores; increasing the ratio of the length of the core to its diameter. An important step in this direction is the development in the United States and Great Britain of fin-stabilized subcaliber shells with elongated cores for the 105 and 120 millimeter rifled cannons of the M60A1 and Chieftan tanks. Fixed rounds with these subcaliber shells and partially combustible cartridge cases

FOR OFFICIAL USE ONLY

are being built in West Germany and France for the 120-millimeter smooth-bore cannons of the Leopard-II tank (under development) and the modernized AMX-32. These shells have higher muzzle velocity, better armor-piercing capability, and greater effective firing range than conventional armor-piercing shells. This has made it possible to increase the firepower of tanks without increasing the caliber of the cannon.

Integrated fire control systems have come to be used extensively for more effective tank fire. These systems have laser sight-range-finders, electronic ballistic computers, weapon stabilizers on two planes, and sophisticated optical and infrared sights and observation devices. The control elements of the gunner's fire control system are duplicated at the tank commander's position. The use of such fire control systems makes it possible to increase the probability of hitting the target on the first round from a fixed position and on the move and to reduce the time required to prepare and fire. These systems are being supplied not only for tanks under development such as the XM1 and Leopard-2, but also for modernized tanks (the American M60A3, the French AMX-32, the West German Leopard-1 A4, the British Chieftan Mk3 and Mk5, and the Swiss Pz68A2). No automatic loading mechanism is envisioned for the XM1 and Leopard-2 tank cannons. Of all the principal combat tanks existing today, only Sweden's STRV-103B turretless tank has an automated cannon loading process.

In the opinion of NATO military specialists, an improvement in the accuracy of fire from a tank on the move will be achieved by highly precise stabilization and automatic correction of the cannon position, in other words, maintaining the direction to the target regardless of movement in the horizontal and vertical planes while traveling. The Western press reports that the possibility of stabilizing the weapons of armored vehicles in three guidance planes is being studied in West Germany.

One of the important ways to increase the firepower of future tanks now being developed abroad is devising guided missile shells. They are launched through the barrel of the cannon and have a semiactive guidance system in the final leg of the trajectory with laser illumination of the target. This kind of shell is considered a supplementary means of firing at long range (3,000 meters and more) where guided missiles have unquestioned advantages over conventional shells. Work is also underway in the United States and other Western countries to build a shell with a self-guiding head.

In recent years a trend has been observed for tanks to have an effective weapon against helicopters in addition to the cannon. To accomplish this various NATO countries are developing special guided missiles and 20 and 30 millimeter automatic cannons which are capable of firing at both ground aerial targets.

According to calculations by foreign military specialists, raising the probability of a hit to 50 percent and more at long range when

FOR OFFICIAL USE ONLY

firing on the move is possible only by firing two rounds or more. They believe that the only way to solve this problem is to mount two cannons on the tank or have an automatic cannon with a high rate of fire. It is considered that a small, light 60-90 millimeter automatic cannon can provide the necessary firepower for future tanks while reducing their weight and dimensions, increasing mobility and survival capability on the field of battle, and with a reduction in the cost of purchase and operation. This new line of experimental development of tank cannons has gone furthest in the United States.

The mobility and cross-country capability of tanks are viewed today in the West as the chief factors that insure a high rate of speed in combat operations and a significant improvement in survival capability on the field of battle.

When modernizing existing tanks and developing new ones foreign specialists try above all to increase their traveling speed, especially average speed on terrain, traveling range, cross-country capability, engine pick up, turning ratio, acceleration characteristics, braking effectiveness, and smoothness of ride. The mobility and cross-country capability of tanks is being increased by installing more powerful engines and improving transmissions and drive trains.

It is widely known that current tanks of the so-called "second generation" built in the early 1960's (the U. S. M60A1, the West German Leopard-1, the British Chieftan Mk2, the French AMX-30, the Swedish STRV-103, and the Swiss Pz68) develop maximum speeds of 40-60 kilometers an hour and average speeds of 15-34. Their specific capacities are 13-22 horsepower per ton. These parameters are significantly higher on the third-generation tanks now being developed (the American XM1 and West German Leopard-2): maximum speeds are 70-75 kilometers an hour, average speeds are 45-50 kilometers an hour, specific capacity is about 30 horsepower a ton. Despite their great weight (50-52 tons), they have better engine pick up than earlier tanks. The program of tank modernization in the United States, France, and Great Britain includes work to increase the mobility of existing tanks by installing more powerful engines (up to 1,200 horsepower), improved transmissions, and better drive train suspensions.

On future fourth-generation tanks foreign specialists plan to increase average speeds to 55 kilometers an hour and more and specific capacity to 40 horsepower per ton. Engine pick up will also be greater.

The basic tanks of the capitalist countries today use four or two stroke diesel and multifuel liquid and air cooled engines of 700-830 horsepower. The four-stroke multifuel liquid-cooled engines with turbo supercharging that are being developed in West Germany, France, and Great Britain are considered promising for the near future. These engines have up to 1,500 horsepower and in the future may be enlarged to 1,800 horsepower.

FOR OFFICIAL USE ONLY

A trend toward the use of gas turbine engines on tanks has been observed in recent years. The first foreign tank with such an engine, a 1,500-horsepower engine, is the XM1 American tank being developed by the Chrysler Company. Work is also underway in West Germany to build gas turbine engines for future tanks. It is believed that these engines can become the basic power plants for fourth-generation tanks. However, a number of problems must be solved before they can be installed in tanks. These problems relate to eliminating shortcomings such as the high specific expenditure of fuel and high air expenditure, which creates difficulties when tanks cross water obstacles along the bottom.

Work is being carried on in the Western countries to design new transmissions in order to make it possible to use more powerful engines and insure high engine pick up and turning capability in future tanks. In the opinion of foreign specialists, the most sophisticated transmissions today are the X-1100 hydromechanical transmission of the American XM1 tank and the HSWL-354 Renck transmission on the West German Leopard-2. They have integrated hydrodynamic gears with an interlocking clutch, a four-stage automatic gearbox, and a differential turning mechanism with hydraulic control linkages that provide stepless change in the thrust force on the tracks.

Higher speeds when traveling on broken terrain and acceptable shock absorber characteristics have now been attained by improving the drive train suspension. The main type of suspension on a majority of modern tanks to the present time has been torsion-bar suspension. A more efficient tubular-core suspension with vein-type hydraulic shock absorbers has been developed for the new American XM1 tank. However, from the point of view of insuring automatic change in shock absorber characteristics depending on road conditions, foreign experts consider the hydropneumatic (air-oil) suspension first installed in the Swedish STRV-103B tank and later on the Japanese 74 tank to be most acceptable. It is expected that this suspension will also be used on future foreign tanks.

To improve the operating reliability of tanks abroad serious attention is being given to solving the following problems: simplifying repair and maintenance of the primary assemblies and aggregates, reducing time required to install and remove parts, insuring standardization and mutual replaceability of assemblies, and using automatic equipment to test the technical condition of the primary systems and aggregates.

The protective characteristics of tanks have a significant influence on their fighting effectiveness and survival capability under enemy fire. In the opinion of foreign specialists, the protective features of the primary tanks in the capitalist countries do not meet current requirements for waging combat operations where ground forces have large numbers of new antitank weapons.

FOR OFFICIAL USE ONLY

In recent years two lines of solution have been pursued for the problem of tank protection: intensifying what is known as passive defense and creating a system of active defense.

Passive tank defense is intensified by thickening the frontal armor of the body and turret, using armor of different thickness along the length and height of the tank, employing angles of 75 degrees and more inclination for the armor sheet, reducing tanks silhouettes, and introducing stronger materials and improved techniques for manufacturing and processing armored parts.

The use of combined types of armor developed in recent years is considered a more effective method of intensifying passive defense.

Great Britain has made the greatest advances in improving passive tank defense. In 1976 the British developed a new armored technique that is called the "Chobham" method. With this method a special armor is used consisting of an external (thicker) steel sheet and an internal sheet between which are ceramic elements that overlap one another and are enclosed in a shell of armored aluminum alloy or plastic. Foreign military specialists believe that this type of armor provides a higher level of protection than conventional armor against various types of antitank weapons, including fin-stabilized subcaliber and hollow-charge shells and antitank guided missiles. The "Chobham" armor method is 10 percent more expensive than the conventional method, and the cost of a tank with such armor is 1-2 percent higher. This technique was first used in modernizing the English Chieftan (Sheer Iron) tanks. The armor protection on West German Leopard-2 tanks, American XM1 tanks, and the modernized French AMX-32 has been done in a similar fashion.

Side screens (false sides) that increase protection against hollow-charge shells have been used extensively in recent years. They are now installed on most modernized tanks and are envisioned for use on all tanks under development.

The level of protection in tanks is also being improved abroad by introducing new design concepts that permit arrangement of the primary assemblies and aggregates in the forward part of the machine with the explosive components in less vulnerable places. For example, the fuel and ammunition in XM1 and Leopard-2 tanks are placed in compartments that are separated off from the battle compartment. The use of new automatic firefighting equipment on these tanks makes it possible to extinguish a fire in the tank in one second. The foreign press reports that taking these steps makes it possible to improve the protective features of new tanks 2-2.5 times compared to existing tanks.

Projects to devise active protection of future tanks are in the initial stages. Active protection should provide detection and neutralization of artillery shells and antitank guided missiles, including missiles launched from helicopters, that are flying toward the tanks.

FOR OFFICIAL USE ONLY

Plans call for solving this problem by laying down smoke screens and creating interference that obstructs the operation of the missile control system, camouflaging tanks against visual and radar detection, and screening off sources of tank heat radiation to reduce the range of heat detection.

The English device for laying smoke screens to camouflage combat vehicles has now become widespread. Tanks being modernized have this equipment and tanks under development as well as certain other combat vehicles in various Western countries will have it. The device is a multibarrel launcher that is usually mounted on the tank turret. Its ammunition package includes 54-80 millimeter grenades loaded with red phosphorus. The device can create a dense smoke screen in two seconds; the screen will last about three minutes. The standard ammunition package for almost all foreign tanks includes smoke shells that can put down a blinding curtain at the firing range of the tank cannon.

The United States and other NATO countries are developing launchers to fire smoke missiles with remote fuses that will make it possible in five seconds to create a camouflaging smoke screen 180 meters long and 120 meters high.

Research is also being conducted on the blinding action of combined manmade clouds against optical instruments. These clouds are produced on the basis of rocket fuel and are a mixture of oil smoke and colored smoke. New coloring components are being sought to produce smokes that match the color of the terrain background. The United States, in particular, has already developed colored smoke for desert and vegetation backgrounds.

To reduce the effectiveness of missiles that are guided to sources of heat radiation, the United States and other countries are carrying out projects to reduce the temperature of the exhaust gases of tank engines by specially designed exhaust pipes and louvers.

In the opinion of Western military specialists, the main directions of work being done in foreign tank building to modernize existing tanks and develop future tanks should result in an improvement of tank survival capability on the field of battle.

COPYRIGHT: "Zarubezhnoye voyennoye obozreniye", 1978

11,176
CSO: 1801

FOR OFFICIAL USE ONLY

DEVELOPMENT OF FIELD ARTILLERY AMMUNITION IN WEST

Moscow ZARUBEZHNOYE VOYENNOYE OBOZRENIYE in Russian No 11, Nov 78 signed to press 3 Oct 78 pp 35-40

[Article by Eng-Lt Col (Res) V. Vorontsov and Eng-Maj V. Vyacheslov, candidate of technical sciences: "The improvement of Field Artillery Ammunition"]

[Text] Army leaders of the main capitalist nations attach prime importance to the improvement of field artillery weapons. Foreign military experts feel that artillery's role is continuously growing in the contemporary situation. This fact accounts for the large scope of research and experimental design work being performed abroad, especially in the United States, the FRG, Great Britain, France, Italy and Sweden to perfect existing artillery systems and develop new ones.

Foreign experts are attempting to give artillery systems great fire power by improving both the guns themselves and their ammunition. According to the foreign press, recent studies have shown that all of the basic fire power factors in artillery systems can be improved considerably: the firing range can be increased significantly, accuracy improved and the effect of the ammunition on the target heightened by perfecting the shells.

Increasing the Firing Range

The firing range of an artillery weapon is a function of the shell velocity, the angle of departure and the degree of air resistance. The shell velocity, in turn, depends on its initial (muzzle) velocity V_0 at the moment it leaves the barrel, and can be expressed with the formula:

$$V_0 = \sqrt{\frac{2\bar{P}X_e}{Q}}$$

where \bar{P} is the average powder gas pressure in the bore;
 X_e is the distance the shell travels inside the barrel;
 Q is the lateral shell load (weight-to-caliber ratio).

FOR OFFICIAL USE ONLY

FOR OFFICIAL USE ONLY

An analysis of the formula shows that muzzle velocity and correspondingly, the firing range, can be increased by increasing \bar{P} or X_e , as well as by reducing Q .

The first two methods of increasing muzzle velocity are used most extensively abroad. Specifically, they were used in the United States for updating the 155mm and 203.2mm self-propelled howitzers (M109, M110). The barrels were lengthened and new propellant charges were developed. The latter had a longer combustion period with practically the same maximum gas pressure in the bore. In this manner, the muzzle velocity of an M109 howitzer shell was increased from 563 to 684 m/s, which raised the maximum firing range by over 20 percent, from 14.6 to 18 km.

The third method has long been used in the manufacture of sub-caliber shells, which are smaller in diameter than the caliber of the barrel. Such shells are extensively used abroad in anti-tank and tank artillery systems. Sub-caliber shells for field artillery, however, are still in the development stage. Figure 1 [drawings not reproduced] shows a 155mm sub-caliber howitzer shell under development in the FRG. It has a detachable base disc and a guiding flange. Stability in flight is provided by control fins.

An experimental 155mm sub-caliber howitzer shell has been developed in the United States. It has small centralizing ribs and a plastic driving band, which separates as the shell exits the barrel. A range of 35 km was reached when these shells were fired from 155mm M198 (U.S.) and FH70 (NATO) howitzers, whereas the maximum firing range for these weapons using conventional shells is 24 km.

As noted above, the firing range of artillery weapons can be increased by reducing the force of air resistance on the shell. The development of shells with an improved aerodynamic shape has been based on this principle.

An HE fragmentation shell with an improved aerodynamic shape has been adopted by the military in France for use in the 155mm GCT self-propelled howitzer. It has a longer ogive and a longer overall length than the conventional shell and has a short wall. The lowering of the drag coefficient made it possible to increase firing range by approximately 16 percent over that of the conventional shell (23.2 compared with 20 km).

The U.S. Space Research Corporation has developed the 155mm ERFB shell with an improved aerodynamic shape (Fig. 2). It has been lengthened and has practically no wall, and special ribs located at a rigidly defined angle to the shell axis serve as the positioning band. The shell shape and the ribs ensure minimal drag and shell stability, both in the barrel and in flight. The geometric dimensions of the ERFB are the following (the dimensions for the conventional M107 shell are given in parentheses for purposes of comparison): overall length--5.6 (4.4) cal.; ogive length--4.4 (3.7) cal.; base length--1.2 (0.7) cal.; weight in both cases--43.5 kg.

FOR OFFICIAL USE ONLY

The table below contains comparative firing range data for the 155mm M107 and ERFB shells fired from various field artillery weapons.

Comparative Firing Range Data for ERFB and M107 Shells

(1) Тип орудия	(2) Заряд	(3) Начальная скорость, м/с	(4) Максимальная дальность стрельбы снарядом, км	
			M107	ERFB
(Б) Гаубица M109	M4A1	563	14,6	16,3
Гаубица M109A1	M110	684	17,0	20,7
Гаубица M108	XM201	825	22,1	26,4

Key:

- | | |
|--------------------|-------------------------|
| 1. Type of weapon | 4. Maximum firing range |
| 2. Charge | 5. Howitzer |
| 3. Muzzle velocity | |

Improving a shell's aerodynamic shape therefore makes it possible to improve its firing range by 10-20 percent. American experts also note that its fragmentation and blast effects are approximately 30 percent greater than those of a conventional shell.

A considerable amount of air resistance to the shell (around 30-40 percent) results from so-called "base insuction"--the effect of rarification of the air behind the base as a result of air burbling off its rim. In order to reduce the degree of rarification, steps are being taken to improve the shape of the base section. Experts at the Bofors company in Sweden have significantly neutralized "base insuction" (by 50-70 percent) by placing a slow-burning pyrotechnic compound in a recess in the base of the shell.

The use of shells with a recess in the base section makes it possible, by increasing the cavity volume, to employ stronger propellant charges without altering the propellant density. This, in turn, increases the shell's muzzle velocity and, correspondingly, the firing range.

NATO military experts feel that one of the main methods of increasing the firing range of standard guns and mortars, while preserving their present weight, dimensions and barrel life, lies in the use of rocket-assisted projectiles (ARS).

Such a projectile has a relatively light-weight rocket engine in the base section, which is activated after the shell has exited the barrel. The propellant effect of gases from the burning fuel increases the speed by approximately 15 percent over the muzzle velocity. Firing range is increased by 25-30 percent as a result.

FOR OFFICIAL USE ONLY

POL [expansion unknown] powder (with no solvents) and compounding materials are used as the rocket fuel. POL powder consists of nitrocellulose and nitroglycerine in a ratio of 60:40. They create a specific thrust of up to 200 kg/kg. The combining materials may include, for example, 70% perchlorate of ammonium, 10% filler metal and 20% polyurethane. Such fuel provides a specific thrust of up to 280 kg/kg, and its combustion rate is 10-30 mm/s. The rocket engine in rocket-assisted projectiles now in use function for 2 to 4 seconds.

Rocket-assisted projectiles have a number of shortcomings, the following being noted abroad: reduced effectiveness due to the reduction in the quantity of explosives (the filling coefficient for rocket-assisted HE fragmentation shells of more than 100mm is 5-10 percent, while that of conventional shells is 10-25 percent); an almost 1.5- to 2-fold increase in scattering due to the instability of the rocket engine's functioning; a reduced storage life for the charged ammunition (down to approximately 10 years) due to alteration of the rocket fuel properties.

Despite the above disadvantages, rocket-assisted projectiles and mortar bombs have become fairly widespread. At the present time they are part of the battle scale of ammunition for 155mm and 203.2mm howitzers and for 81mm and 120mm mortars in the armies of the main NATO nations. Their use with the M198 (U.S.), M110A1 (U.S.), FH70 (NATO) and GCT (French) howitzers has made it possible to increase their firing range to 30 km. The use of rocket-assisted mortar bombs (ARM) in 120mm mortars has increased their firing range by 55-80 percent. The employment of 120mm rocket-assisted mortar bombs in the light M60 mortar (French), for example, has increased its firing range by almost 80 percent, from 3.6 to 6.55 km. The use of 120mm rocket-assisted mortar bombs with a rifled mortar produced by the French Hotchkiss-Brandt company has increased its firing range to 12.8 km, compared with 8.3 km for a conventional mortar bomb.

The development of liquid-fueled rocket engines with greater stability under various conditions is one of the important fields of development of rocket-assisted ammunition. The experimental (Dikorap) rocket-assisted howitzer shell with a liquid-fueled rocket engine is one example.

Improving Firing Accuracy

It has become especially important to improve the firing accuracy of artillery weapons in the 1970's. Work in this field is taking two main directions: reducing error in the preparation of initial firing data (which is practically not connected with problems of perfecting ammunition) and reducing dispersion of the shot. Steps are being taken to achieve this, which focus on reducing the influence of external factors on the shell flight and on improving ammunition manufacturing precision.

The development of guided artillery shells is a new area of focus for substantially improving the firing accuracy of field artillery. The development of such ammunition was first begun in the United States. The Martin-Marietta company is presently developing the 155mm XM712 Copperhead hollow-charge

FOR OFFICIAL USE ONLY

shell with a semi-active, laser-type homing head. A laser emission receiver is mounted in the nose section, and the body contains electronic equipment which generates commands for controlling the planes of the tail section. The body has stabilizing wings, which create additional lift. The shell is 8.85 cal long and weighs 61.23 kg. It is almost twice as long as the conventional M107 HE fragmentation shell of the same caliber (4.4 cal, 43.5 kg).¹

During tests conducted in 1976 in the United States, the foreign press reported, targets were illuminated by laser target indicators on the ground, on armored personnel carriers, helicopters and unmanned aircraft. A total of 12 firings were conducted, four of which were unsuccessful due to malfunctions of equipment. The tests were conducted both during the day and at night, against moving and stationary tanks. Each successful firing resulted in a direct hit, and the shells struck no more than 0.75 m from the point of aim provided by the laser target indicator.

It is planned to adopt the Copperhead for use by the military and to produce the first series of 3,000 in 1979. The U.S. Defense Department plans to purchase 100,000 of the missiles, providing the cost per item does not exceed \$3,564 at the 1975 rate of exchange.

Guided artillery ammunition is also being developed in other NATO nations. The FRG, for example, is developing the 120mm Bussarde mortar bomb, which is guided during the terminal phase of its trajectory.

Increasing the Effect of Ammunition on the Target

Foreign experts consider intensification of the effect of ammunition on the target to be an important element of the fire power of artillery weapons.

Certain steps have recently been taken in NATO to increase the explosive and fragmentation effect of ammunition. They include, first of all: the use of more powerful explosives--explosives consisting of 60% TNT and 40 hexogen, for example; increasing the explosive filler capacity by reducing the thickness of the missile walls, which will be manufactured of better-quality steel; insuring the prescribed fragmentation of the missile upon explosion by subjecting the body to special treatment.

According to foreign press reports, the work performed in these areas has made it possible to almost double the volume of destruction of personnel and lightly armored equipment with HE fragmentation ammunition. The explosive effect of the French 81mm fragmentation mortar bomb (Fig. 3), manufactured of steel with improved tempering, has allegedly been increased by 2.5-fold over that of the conventional mortar bomb by increasing the filler capacity.

In order to insure the prescribed degree of fragmentation, the bodies of mortar bombs are serrated (this is acceptable in the case of mortar bombs

1. For a more detailed discussion of this subject, see ZARUBEZHNOYE VOYENNOYE OBOZRENIYE, No. 6, 1975, pp 105-106; No. 12, 1976, pp 118-119.--Editors

FOR OFFICIAL USE ONLY

because the forces affecting them are considerably lower than those affecting artillery shells). The French 120mm PEPA rocket-assisted mortar bomb (Fig. 4), for example, has grooves in the body to insure that the explosion of the bomb results in large fragments intended for destroying lightly armored equipment.

Ammunition with prefabricated arrow-shaped (Fig. 5) and round destructive elements have been developed to achieve a greater fragmentation effect. Because of their good aerodynamic shape, the arrow-shaped elements have a dispersion range of up to 500 m when the shell explodes. Serious wounds result when they strike poorly protected areas of the body.

High-precision proximity fuses are being developed to insure that the shell explodes at the optimal height. The use of such fuses together with prefabricated destructive elements can, in the opinion of foreign experts, increase the range of destruction from fragments 3- to 5-fold, depending on the terrain.

In recent years the NATO nations have stepped up the development of cassette-type shells designed for destroying personnel and equipment over large areas, as well as for remote mining of the terrain. The United States has developed 155mm artillery ammunition--the M449A1, M692, M731 and M483A1 shells (Fig. 6)--for this purpose.

The M449A1 includes elements of the M43A3 shell, which contain prefabricated fragments in the form of small balls. When they strike the ground the elements explode and the balls, dispersing at great speed, injure personnel within a radius of up to 7 m. The M692 and M731 shells are used for remote mining of the terrain. Each of the shells contains 36 anti-personnel bounding mines, each of which includes the M43A3 element containing the balls. The M484A1 shell with a percussion fuse contains 88 38mm hollow-charge elements designed for destroying armored targets. Similar cassette-type shells have been developed for the 203.2mm howitzers.

The continued improvement of nuclear artillery shells has been given an extremely important place in plans for building up the field artillery fire power of armies of the NATO nations.

The development of a second generation of field artillery nuclear shells has been completed in the United States. Judging from foreign press reports, the troops are already receiving them. They differ from their predecessors mainly in that the ballistic characteristics are those of conventional HE fragmentation shells and it is possible to regulate the force of the explosion within a range between several tenths of a kiloton and tens or even hundreds of kilotons.

Development of the 203.2mm nuclear artillery shells with increased penetrating radiation (neutron bombs) is practically completed.² Pentagon leaders are

2. For more details on this subject see ZARUBEZHNOYE VOYENNOYE OBOZRENIYE, No. 10, 1977, pp 37-39; No. 9, 1978, pp 28-31.--Editors

FOR OFFICIAL USE ONLY

prepared to arm the troops with neutron artillery ammunition within the near future. These plans, which constitute a danger to all mankind, are opposed by the policy of peace conducted by the Soviet Union and all the other socialist nations, aimed at halting the arms race and implementing the principles of peaceful coexistence.

COPYRIGHT: "Zarubezhnoye voyennoye obozreniye", 1978

11499
CSO: 1801

FOR OFFICIAL USE ONLY

COMMENTS ON ROLE OF HUMAN FACTOR IN AIRCRAFT ACCIDENTS

Moscow ZARUBEZHNOYE VOYENNOYE OBOZRENIYE in Russian No 11, Nov 78, signed to press 3 Oct 78 pp 43-50

[Article by Eng-Capt 1st Rank O. Oblipov and Maj K. Vladimirov, candidate of medical sciences: "The Role of the Human Factor in Flight Accidents"]

[Text] Militaristic groups of the United States and other nations of the aggressive NATO bloc are continuing to build up their armed forces by creating new types and designs of weapons and combat equipment. Weapons models, including those in the air forces, are becoming increasingly complex. Even though they are extremely complex, however, and have a high degree of automation, they are still controlled by man.

Until recently, it was believed abroad that man has unlimited capabilities and that aviation's fighting efficiency could be improved by increasing the complexity of aviation equipment. This attitude has resulted in a situation at the contemporary stage of aviation development, in which further improvement of the tactical and technical characteristics of planes and helicopters can frequently not be justified using the cost-efficiency ratio as the criterion. This is due to real limitations of the pilot's ability to access the large quantity of incoming information and to make and carry out decisions within the limited time available.

The importance of creative action on the part of the pilot during a flight has increased sharply as the aircraft, the airborne equipment and the conditions of their combat employment have grown more complex. He must make optimal decisions in a rapidly changing situation and in changing surroundings and with a drastic reduction in the amount of time available for performing the mission. These circumstances produce great mental and physical stress approaching the limits of man's capabilities, as a result of which the pilot is not in a condition to use the aircraft with full effectiveness. The foreign press reports that combat aircraft are even now being used at an efficiency level 25-30 percent below their rated performance. Furthermore, the amount of time required to master their operation has increased 3- to 5-fold, and development and operating costs have increased. The significance of

FOR OFFICIAL USE ONLY

FOR OFFICIAL USE ONLY

pilot error has grown simultaneously, resulting in an increase in the number of accidents: 367 flight accidents occurred and 239 aircraft were lost in the United States in 1975 alone (see table).

Losses of U.S. Military Aircraft in 1975

(1) Вид вооруженных сил	(2) Количество летных происшествий	(3) Число потерянных летательных аппаратов	(4) Показатель аварийности *	(5) Материальный ущерб, млн. долларов
(6) Сухопутные воюсна . .	93	43	0,63	16,4
(7) ВМС (включая морскую пехоту)	158	117	0,73	203,5
(8) ВВС	110	79	0,28	281,6
(9) Итого	367	239	.	590,5

Key:

- | | |
|---------------------------------------|-----------------------------|
| 1. Branch of armed forces | 6. Ground forces |
| 2. Number of flight accidents | 7. Navy (including marines) |
| 3. Number of aircraft lost | 8. Air force |
| 4. Accident index | 9. Total |
| 5. Economic loss, millions of dollars | |

Let us point out that in the United States any incident in aviation is listed as an accident if it involves any sort of damage to an aircraft on the ground or in the air, whether or not it results in a fatality or injury to personnel (the death of even a single crew member within a period of 30 days following the accident is considered a fatality). Any sort of damage to an aircraft in flight or during a take-off or landing is listed as a flight accident. If an aircraft was destroyed or damaged significantly and if personnel died (or were maimed) as a result of an accident, it is classified as a serious one. Minor accidents are those which result in insignificant damage to aircraft and in light wounds or other injury to personnel.

Judging by reports in the military press, errors by personnel and equipment failures are the main causes of flight accidents in the U. S. Air Force. Adverse environmental factors, occupational hazards, breakdowns of interaction within the "pilot-aircraft" system and deterioration of health during the performance of missions, as well as inadequate training, are the main causes of pilot errors. The fighting efficiency of the pilot, as the controlling element in the "pilot-aircraft" system, which is determined by the effect of these factors, is referred to in the foreign press as the human factor. Foreign experts estimate that this factor is responsible for more

* The accident index is the number of accidents per 10,000 hours of flight time. It is greater in the naval air force and the ground forces than in the Air Force. Foreign military experts attribute this to increased complexity of operating deck-launched aircraft and to the massive and intensive involvement of Army helicopters in various missions.

FOR OFFICIAL USE ONLY

than 55 percent of all flight accidents. Between 1965 and 1970, up to 70 percent of the aborted missions, emergency situations and accidents in the U.S. Air Force occurred for the above reasons. They accounted for an especially high percentage in the fighter aviation (80 percent), which is explained by the fact that the operation of fighter aircraft is more intensive and complex than that of aircraft in the other branches of aviation.

Quality improvement constitutes the main trend in the development of the modern air forces. Military aviation equipment and armament systems are designed and built in general so that, while compromising from the viewpoint of interaction within the "pilot-aircraft" system, the greatest possible results are obtained from their operation. The science which studies the dynamics and "interrelationship" between elements comprising this system is called ergonomics* in the West European countries and engineering psychology in the United States. Its main purpose is that of simplifying interaction with the above system.

Figure 1 contains a diagram for considering the human factor when creating a "pilot-aircraft" system (from the ergonomic point of view). It shows the basic determining factors, which are briefly discussed below.

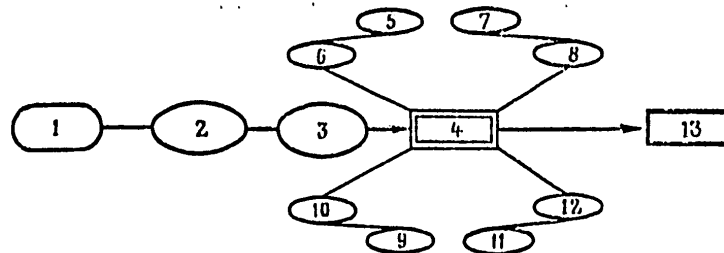


Figure 1. Consideration of Human Factor in the Creation of an Optimal "Pilot-Aircraft" system

Key:

- | | |
|--|--|
| 1. Human resources | 8. Life-support system |
| 2. Professional selection of candidates for flight careers | 9. State of pilot's health |
| 3. Professional training | 10. Equipment for monitoring state of pilot's health |
| 4. Pilot | 11. Interaction within "pilot aircraft" system |
| 5. Occupational hazards | 12. Consideration of pilot's emotional and physical qualities for creating an aircraft |
| 6. Personal protective, survival, life-saving equipment | 13. Optimal system |
| 7. Influence of environment | |

* Ergonomics is the scientific discipline which studies man's functional abilities in the work process and reveals possibilities and mechanisms for creating optimal conditions for highly productive work.

FOR OFFICIAL USE ONLY

Professional Selection and Training of Flight Personnel

The professional selection of candidates itself ensures that the pilots will be able to perform prolonged flights in modern aircraft without significant departure from required standards.

Other nations are attempting to compile a system of tests to be used in selecting future pilots--for measuring their memory capacity and determining their ability to process information rapidly and accurately and their ability to budget their time and to make optimal decisions. This would help to determine how well a candidate's abilities measure up to presentday requirements. It is felt that the testing of an individual's attention skills and reaction speed should be approached with the attitude that those individuals are most suited to flight work who make the fewest errors in their work per unit of time, and not those who perform the greatest amount of work.

At the U.S. Air Force Center for the Study of Human Resources at Brooks Air Force Base in the state of Texas, constant attention is given over to the development of a system for the psychiatric selection of flight personnel, using electronic computers. This system will make it possible to evaluate the individual's personal qualities and to reveal psychic disorders which might lead to flight accidents. The study places importance on learning the candidate's heredity, his childhood experiences and his motives for selecting a career in flight work. The commanders of air subunits are instructed to be constantly aware of the internal stimulae determining a pilot's behavior and to know certain intimate details about his personal life.

The pilot training system determines the level of the pilots' skill and their ability to operate aircraft properly in various situations. At this stage a pilot must "become close," so to speak, with the aircraft and its equipment. The more thorough this process is, the fewer will be the factors which could give rise to flight accidents. The American experts are therefore constantly perfecting the training system, determining and eliminating its inadequacies. A special Air Force commission found the following main deficiencies in the training of fighter pilots at the beginning of the 1970's, for example:

- the instructor was not able to evaluate a cadet's behavior and actions, even when flying in the same aircraft;
- the cadet received only sporadic evaluations of exercises performed during solo flights, and these were not reinforced with graphic illustrations;
- the trainee was not given the opportunity to evaluate his actions objectively (from a detached position);
- instrument flight experience was accumulated very slowly, because the airmen were poor at memorizing the readings;
- exercises for developing skills in the combat employment of the aircraft were simplified, specifically, existing targets did not possess great maneuverability and did not fully simulate the actions taken by an enemy.

FOR OFFICIAL USE ONLY

A new training system was developed in the Air Force, based on the commission's conclusions and recommendations, under which a multifaceted, objective evaluation is provided for all the cadet's actions during a flight by observing him simultaneously from six points (four or five of which contain automatic television cameras). The cadet and the instructor receive needed information instantaneously from the rapid feedback. In addition, there are special mathematical programs for comparing the cadet's pilotage with that of the "ideal" pilot by means of an onboard digital electronic computer. This computer is used to determine the duration and focus of each cadet's training, depending on his individual success. Such programs make it possible to evaluate an airman's actions even when there are no fixed criteria for this or when such criteria are contradictory.

In foreign nations, increased emphasis is being placed on the use of flight simulators for training flight personnel. Such training occupies a significant portion of the training time and develops the pilot's skills in spacial orientation, proper distribution and evaluation of the instrument readings, and his preparedness to make an emergency exit from the aircraft. The trainees go through the different elements of combat missions in them.

According to foreign reports, the adoption of flight simulators in the combat units made it possible to reduce the number of flights in the Air Force and Navy by 1,750,000 in 1975 alone, and it is planned to cut the number of training flights performed in aircraft almost in half by the mid 1980's. This will also save a considerable amount of money (it costs \$1,437 to operate a B-52 for 1 hour, and \$90 to operate a B-52 flight simulator for the same period).

The Effects of Environmental Factors and Occupational Hazards (noise, vibrations, infrared and supersonic emissions, and so fourth)

Breakdowns in interaction within the "pilot-aircraft" system frequently result from fatigue during long flights under difficult conditions and from failure to adhere to the established regimen of rest, sleep and diet during long cross-country flights.

Even slight vibrations or a heightened noise level in the cockpit has a considerable influence on the crew's psychophysiological state. Foreign experts maintain that the noise level on modern aircraft exceeds the established limits.

The pilot's ability to function depends greatly on the reliable operation of the life-support systems. In the summertime, the temperature in the cockpits sometimes rises above 50°C, and falls to -20°C at great altitudes on many aircraft flying at low altitudes. As a rule, the concentration of oil vapors and aerosols in cockpits exceeds the maximum permissible level many times over.

Adverse environmental factors and flight conditions are counteracted in various ways abroad: cabin pressurization is improved, pressurized helmets are used, special training drills are conducted for the airmen, anti-g suits are improved, the crews land at intermediate airfields during long cross-country flights, and so forth.

FOR OFFICIAL USE ONLY

The State of Health of Flight Personnel

Foreign military experts have estimated that 40 percent of the flight accidents occurring due to the human factor are a result of drastic loss of efficiency on the part of the pilot. This occurs when latent illnesses, mainly cardiocascular and emotional, manifest themselves in the presence of overloads.

An average of six accidents due to cardiovascular or cerebrovascular diseases occur each year in U.S. aviation. These have been responsible for 4 percent of the aircraft disasters in the U.S. military aviation in the past 10 years. They are most frequently manifested in the form of myocardial infarcts or irregular functioning of the heart. Serious forms of these diseases are not necessary for flight accidents to occur.

The American press indicates that this group of diseases among airmen is constantly growing in proportion, due to the high degree of "wear and tear" on the pilot because of the substantial level of psychophysiological stress, prolonged flights and extensive flight duty. Despite this fact, however, the trend continues abroad to lengthen the pilot's service term, because a great deal of experience is required to operate modern aircraft.

A large portion of the accidents are caused by latent forms of epilepsy, which manifest themselves under the great stress experienced in the performance of missions, taking the form of loss of consciousness, disturbance of spacial orientation, motor inadequacies, incorrect appraisal of the situation and of aircraft speed and altitude, and incorrect reaction to reports and commands. Computer tomography is being successfully used for revealing latent forms of epilepsy. It is based on the registration and analysis of the tissue's absorption of a narrow beam of X-rays directed through the cerebral cortex tangent to the surface, at points 1 degree apart. Sections of the cerebral cortex separated by 2-3 mm are analyzed with electronic computers to detect the epileptic nidus. The fact has been established that individuals with a low alpha index on the encephalogram display a high level of neurosis and anxiety.

Methodological techniques are being developed in the FRG for detecting micro-symptoms of incipient diseases of the heart and brain, which may manifest themselves at critical moments during a flight.

Judging from foreign press reports, more than 30 percent of the flight personnel discharged from the air forces of the NATO nations are relieved due to psychic disorders, which are closely linked by cause-and-effect to the nature of their flight work. These diseases are listed as occupational. They are most frequently manifested in the form of a state of anxiety for airmen below the age of 35 years. This state is especially clearly manifested in flights at altitudes above 12,000 meters without visible reference points, when the natural horizon disappears and it seems to the pilot that he is in a state of suspension, immobility and unstable equilibrium. Pilots over the age of 40 frequently fear the occurrence of a myocardial infarct or the appearance of a malignant tumor. They begin to fear certification tests and medical examinations.

FOR OFFICIAL USE ONLY

A loss of flight motivation has presently become widespread among personnel of foreign armies, manifested in a lack of desire to fly in pilots. It is sometimes difficult to determine whether the pilot actually does not want to fly (although he is capable of doing so) or is refusing to fly because of an illness. The problem is complicated when the pilot gives only poor health as the reason and does not indicate the real reason for refusing to fly. In the opinion of medical experts in the French Air Force, such behavior should be regarded as a grave indication of psychic instability.

In order to monitor an airman's state of health, continuously and objectively, and to see that he performs the safety measures at the right time, devices are being developed for continuously registering the body's basic vital signs (body temperature, electrocardiogram, electroencephalogram, and others). A pilot's seat is being perfected in Norway, for example, with sensors for the continuous registration of an electrocardiogram without attaching electrodes to the body.

The Effort to Achieve Optimal Interaction Within the "Pilot-Aircraft" System

The nature of the pilot's actions prior to an accident and his conduct in the emergency situation itself depend on his ability to comprehend incoming information in order to take the proper steps. This capability is determined by the pilot's psychophysiological preparedness to react promptly and correctly to unexpected changes in the situation. The level of this preparedness is very unstable, depending primarily on the experience, professional training and health of the airman.

American experts assume that 60 percent of all flight accidents due to the human factor result from the fact that the pilot's skills are not always up to the demands made while flying aircraft with high performance specifications, at critical moments in a flight. This is most frequently caused by the excessive number of objects requiring attention at the pilot's position, including information display equipment and control elements (Fig. 2 [figures 2,3 and 4 not reproduced]). The pilot's focus is dispersed because of this, and there is not enough time to process the incoming information and to carry out decisions. At the same time, there is frequently a lack of information, aggravated by poor display clarity, during the most difficult phases of a flight (flying at low altitude, combat employment, and the instrument landing). In addition, there is a lack of display equipment for indicating malfunctions in the performance of certain types of equipment or even entire aircraft systems. In certain years, the number of accidents occurring because of this during landings in the U.S. Air Force accounted for up to 70 percent of the total number. Combined flight control and signal systems are presently being developed with this in mind. The output of total information and a reduction in the quantity of equipment required for displaying it will, in the opinion of foreign experts, simplify the pilot's work significantly (Fig. 3).

The pilot's work is seriously hindered by deficiencies in the cockpit design and the impractical arrangement of control elements, especially when ejecting from the aircraft. The ejection levers on certain types of aircraft, for

FOR OFFICIAL USE ONLY

example, make it difficult to pull the control stick during landings. When starting up the engine a pilot may eject himself onto the landing area by accidentally pulling loops attached to the levers. Foreign experts note the following shortcomings: great differences between the cockpit equipment of aircraft in the same class, the nonstandard arrangement of control elements and certain other factors contributing to the incidence of emergency situations (Fig. 4).

Optimal congruity of crew and aircraft is being achieved by providing airmen with specific training and by improving the design of equipment and control elements, by automating control processes, and so forth. The experts find practical solutions to problems not simply by applying accumulated experience in the operation of aircraft equipment, but also by monitoring the airmen's condition and behavior during a flight. One promising method of monitoring them lies in the interpretation of signals depicting the state of the airman's central nervous system at each given moment. Registration of the bioelectric potentials occurring in the cerebral cortex is the most important element. It is already possible to interpret with 90 percent reliability, five types of manifestations of activity in the human cerebral cortex, which makes it possible to assess the individual's readiness to perform a mission, his level of attention to incoming information, and his difficulty in dealing with complicated flight situations and reacting to unexpected events.

Modern methods for analyzing the pilot's speech from the vibrations produced when pronouncing vowels make it possible to assess his emotional state and his degree of concentration and to detect fatigue and stress during a flight.

Judging from foreign press reports, we therefore find that the continuing development of aviation equipment and weapons and the considerable number of flight accidents caused by the human factor during their operation are forcing the experts to seek effective ways to coordinate the capabilities of man and machine. It is believed that this alone will make it possible not only to reduce the number of accidents and disasters, but also to make more efficient use of the aircraft.

COPYRIGHT: "Zarubezhnoye voyennoye obozreniye", 1978

11499
CSO: 1801

FOR OFFICIAL USE ONLY

COMMENTS ON NATO AIR FORCE EXERCISE HELD IN JUNE 1978

Moscow ZARUBEZHNOYE VOYENNOYE OBOZRENIYE in Russian No 11, Nov 78 signed to press 3 Oct 78 pp 50-53

[Article by Col V. Kondrat'yev: "The 'Tactical Weapons Meet-78' Exercise"]

[Text] Exercises conducted jointly with other branches of the armed forces or independently occupy an important place in the combat training of tactical units and subunits of the aggressive NATO bloc. Methods of conducting air combat operations, using both conventional and nuclear weapons, are perfected in these exercises, and the battle readiness of the units and subunits and the level of the crews' preparedness to perform various combat missions are tested. The NATO command constantly increases the complexity of these exercises and attempts to make them as much like actual combat situations as possible.

The regular competitive air exercise conducted by the joint NATO air forces in the Central European TVD [theater of military operations] between 5 and 14 June 1978, "Tactical Weapons Meet-78," was a typical example of this. Participating in the exercise were air force crews from the United States, Great Britain, the FRG, Belgium, Canada and the Netherlands--members of the 2d and 4th OTAK's [joint air strike commands]. Flights were carried out from several air bases, one of the main bases being Wildenrat in the FRG (Fig. 1 [photos not reproduced]). The exercise was conducted in order to test the caliber of interaction among air subunits of the various nations in military operations in the Central European theater of military operations and to further improve the tactical training of the crews.

According to reports in the foreign press, such exercises have been conducted on a regular basis since 1962, but this year's exercise differed significantly from all previous ones. In the first place, it was combined with the regular "Royal Flush" competitive air reconnaissance exercise (15 such exercises have been conducted since 1956). In the second place, a more complex tactical situation was created. The participating crews overcame powerful conteraction by aggressive "enemy" forces and air defense facilities. electronic jamming equipment was employed on a considerably more extensive

FOR OFFICIAL USE ONLY

FOR OFFICIAL USE ONLY

basis. The flights were performed not over standard routes but along routes unfamiliar to the crews, a large part of which passed through areas saturated with air defense equipment, in direct proximity to the national borders of members of the socialist commonwealth.

The exercise was conducted in two stages. During the first stage, which lasted from 5 to 8 June and was called the "tactical" stage, fighter-bombers carried out hypothetical and actual attacks on ground targets. The crews were assigned their missions not more than 3 hours prior to the designated time for the attack. FGR.2 Phantom fighters of the British Air Force, from Wildenrat Air Force Base in the FRG, F-104 fighters from the Belgian Air Force (relocated from Belgium to Bruggen Air Force Base for the duration of the exercise) and F-115 fighters of the U.S. Air Force, from Bittburg Air Force Base, were designated to intercept the attack forces.

Hypothetical strikes were carried out against airfields at Hopsten and Laarbruch. According to the magazine FLIGHT the attack force, consisting of 16 aircraft (4 F-104's, 8 F-4's and 4 Jaguars) from the air forces of the FRG and Great Britain were to carry out a strike against the air base at Laarbruch with the objective of "closing it down for at least 3 hours."

Taking into account aerial reconnaissance information, which indicated that a large number of "enemy" aircraft had gathered at the air base and that most of them were in exposed parking areas in fairly dense groups, as well as the availability of personnel and equipment for the mission, the commander of the attack force decided to carry out the attack in a "flight column" formation (with four aircraft in each flight), the flights flying with intervals of around 5 kilometers.

The F-104 fighter-bombers, carrying a payload of two bomb clusters each, were to be the first to strike. They were charged with the mission of destroying exposed "enemy" aircraft. They were to be followed by a flight of F-4's carrying nine aerial bombs each, which were to strike at semi-exposed defense installations and at all taxiing aircraft, in order to prevent their take-off. The remaining flight of 4 F-4's, also carrying nine aerial bombs each, were to be the third to strike, part of their mission being to augment the efforts of the first two flights. And finally, the flight of Jaguar fighter-bombers would strike in fourth place (Fig. 2). Their main mission was to "mine" the air base in order to prevent the "enemy" from clearing up the damage caused by the first three flights. It was therefore planned to mount four 1,000-pound delayed-action bombs on the Jaguar aircraft--2 with a delay of 30 min., 1 with a 1-hour delay and 1 with a delay of 5 hours.

When he assigned the mission to the flight of Jaguars, the commander of the 20th Tactical Fighter Squadron of the British air forces in the FRG ordered it to proceed to the target at low altitude in "card" formation. The first two aircraft would fly in a paired formation, forming the "aircraft front," separated by a distance of up to two thirds of the forecasted horizontal visibility, but by no more than 4,000 yards (around 3,650 meters). The

FOR OFFICIAL USE ONLY

second pair was to fly in the same formation, following the first by 15 seconds. This formation would, in his opinion, provide the greatest concealment during the approach to the target and reduce the likelihood of the aircraft being destroyed by air-to-air guided missiles. In case the force were attacked by "enemy" fighters using aircraft cannon, the crews were instructed to evade them on a vertical plane. For passing through the zone covered by ground-to-air guided missiles, it was suggested that the pilots regroup into a tight formation so that the flight would appear as a single target on radar screens of the "enemy's" air defense system. It was also explained that they should separate for the strike against the assigned targets upon entering the zone covered by ground-to-air guided missiles or at minimum distance from the target and to release the bombs from a pitch-up at a 30° angle, from an altitude of at least 500 meters. The commander concluded by summing up his instructions in the following manner: "Fly at low altitude and at high speed, taking advantage of natural features for concealment."

The fighter-bomber crews had practiced bombing, launching missiles and firing the guns at the Elsenborn firing ground in Belgium and the Sennelager ground in the FRG, from altitudes of 150 meters or more and at speeds of around 865 kilometers per hour. The foreign press noted that in actual combat the aircraft would strike from extremely low altitudes and at greater speeds: 40-50 meters and 920-950 per hour, respectively.

In the second stage of the exercise, which lasted from 8 to 14 June and was called the "competition" stage, each crew performed up to five sorties. The flights were carried out both in the daytime and at night. An error of ±20 seconds in time and 100 meters in distance was accepted as the daytime standard for precision in approaching the targets. Practice bombings, missile launchings and cannon firing had been performed at ranges at Nordhorn in the FRG and at Vliehors on the Dutch island of Vlieland. Target approach accuracy and the accuracy with which the weapons were used were considered when totalling up the points.

The reconnaissance aircraft were to fly along assigned 5-kilometer sections of the route and to locate stationary targets therein. Various real targets (tanks, guns and other combat equipment provided for the exercise by the subunits of ground and air forces of the NATO bloc's joint armed forces) were placed along these sections of the route. It was permitted to pass over such a section of the route only once during a flight and at a speed at least that indicated in the mission.

The foreign press pointed out that the "Tactical Weapons Meet '78" competitive exercise demonstrated that the flight and tactical skill of crews in the 2d and 4th joint tactical air commands had improved markedly. Some NATO military experts, however, noted that the state of its air forces still does not measure up to the demands made of them, and called upon the member-nations of that aggressive bloc to continue the arms race and to build up the fighting capability of their forces.

COPYRIGHT: "Zarubezhnoye voyennoye obozreniye", 1978

11499
CSO: 1801

49

FOR OFFICIAL USE ONLY

FOR OFFICIAL USE ONLY

COMMENTS ON DEVELOPMENT OF NEW U.S. UNMANNED AIRCRAFT

Moscow ZARUBEZHNOYE VOYENNOYE OBOZRENIYE in Russian No 11, Nov 78 signed to press 3 Oct 78 pp 59-62

[Article by Lt Col I. Aleksandrov: "The Development of a New High-Altitude, Unmanned Aircraft"]

[Excerpts] Many of our readers have inquired about the development of a high-altitude, unmanned, long-range aircraft underway in the United States. The following article is published in response to their requests.

A large effort has been underway in the United States in recent years to develop unmanned aircraft for various purposes, which, according to American military experts will be able to assume some of the functions performed by piloted aircraft. One such program, code-named "Compass Cope," calls for the development of a multi-purpose, high-altitude, unmanned aircraft capable of remaining in the air for lengthy periods (more than 24 hours). The foreign press reports that such aircraft will be able to perform a number of military functions, both in peacetime and in time of war. They include, among others; the performance of aerial reconnaissance, surveillance over seas and oceans, relaying transmissions for various communications systems, and taking air samples at high altitudes in the atmosphere.

The American military command's aggressive plans provide for the possibility of using unmanned aircraft created under the "Compass Cope" program in place of manned reconnaissance planes, which are now making regular flights along the borders of nations in the socialist commonwealth, engaging in electronic reconnaissance activities.

The American aircraft companies of Boeing and Teledyne Ryan, which developed the YQM-94A and YQM-98A experimental unmanned aircraft under a contract with the U.S. Air Force, have participated in this program on a competitive basis.

The foreign press reports that after carefully analyzing the results of tests conducted in August 1976, the U.S. Air Force decided to continue with the development of an unmanned aircraft based on the experimental model

FOR OFFICIAL USE ONLY

produced by the Boeing company. In this stage, which will take 52 months, it is planned to develop and produce three of the prototype planes (designated the YQM-XX) and to conduct flight tests with them, during which it is planned to test the plane's ability to take off and land automatically on a runway and to appraise its capability for performing certain military functions. In the opinion of foreign experts, the design of the prototype planes will differ to a minimum degree from the experimental models, the main change involving the installation of a more powerful engine in connection with plans for increasing the weight of the payload to 500-900 kilograms. It is planned to add side-scanning radar equipment and equipment for pinpointing the locations of radiating objects on the ground to the payload.

Total cost of the program for development of the YQM-XX unmanned aircraft will be approximately 77.2 million dollars. The U.S. Air Force command has plans for the purchase of around 100 such aircraft, 60 of which will be for operational use, the remaining 40 being used to replace lost aircraft and for other purposes.

Some foreign military experts consider the main purpose of the new, high-altitude, unmanned aircraft to be that of performing photographic, radar and electronic reconnaissance. They also believe, however, that it has possibilities for performing other missions, including the jamming of electronic equipment, the relaying of radio signals in communications systems, and possibly, also delivering strikes against ground targets.

COPYRIGHT: "Zarubezhnoye voyennoye obozreniye", 1978

11499
CSO: 1801

END