~~SECRET~~

THE SECRETARY OF DEFENSE

WASHINGTON, THE DISTRICT OF COLUMBIA

#20

24 NOV 1982

Honorable Joseph M.A.H. Luns
Secretary General
North Atlantic Treaty Organization
Brussels 1110

Dear Mr. Secretary General:

(U) At the NATO Summit meeting last June, leaders of member countries participating in the integrated military structure of NATO agreed in their separate document on defense to explore ways to take full advantage, both technically and economically, of emerging technologies, especially to improve conventional defense. A similar statement of intent was included in the Summit Declaration, agreed by all Heads of State and Government participating in the Summit meeting.

(S) In support of this sentiment, I offered at the May DPC Ministerial to provide a paper on new technology that would provide a basis for collective consideration.

(U) I am now pleased to be able to provide you the attached Executive Summary. The paper itself, which is substantially more detailed, will be provided at the DPC Ministerial.

(S) The paper recognizes the need to improve all elements of the NATO triad to strengthen deterrence across the spectrum of risks to the Alliance in support of NATO's established strategy. It emphasizes, as did the NATO Summit leaders, the importance of improving conventional defense capabilities in order to enhance the credibility of the flexible response and forward defense strategy. NATO can enhance deterrence of aggression and intimidation by demonstrably improving its conventional force capabilities to counter a Warsaw Pact attack.

(S) The paper is not a comprehensive document. It focuses on how emerging technologies can improve defense primarily in the Allied Command Europe Central Region. Subsequent work in NATO must include examining those distinctive requirements for other regions and mission areas that have not been explored fully here.

(S) If NATO can successfully hold in the ACE Central Region against first echelon forces and destroy the effectiveness of operational maneuver groups, follow-on forces, and Warsaw Pact air operations, the Warsaw Pact will be further deterred from launching an attack in that region. With respect to these missions, the concepts explored here combine intelligence/target acquisition/

~~SECRET~~

command and control technology with weapons delivery systems for land and air operations. NATO forces must be able to see in depth into the area of operations of attacking Warsaw Pact forces and attack quickly, accurately and in depth.

(S) The paper distinguishes between emerging technology associated with systems that are now being fielded (or can be fielded well before 1990) in quantity and even more sophisticated technology that is more distant and for which there are greater uncertainties with respect to feasibility and cost.

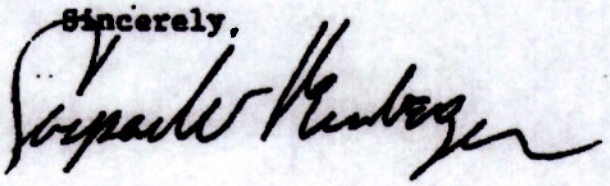
(S) In support of the Summit mandate, I believe we must act in concert and with all deliberate speed to ensure early realization of balanced and coherent defense programs that fully exploit emerging technologies. We must act within the NATO Defense Planning System to give due emphasis to the use of emerging technology to improve fulfillment of the agreed NATO Force Goals, to achieve greater effectiveness in the application of national resources to defense, and to improve the readiness and accelerate the modernization of standing forces. I offer this paper with the objective of initiating NATO Defense Planning System action that may see results in equipment fielded later in the 1980s. Efforts over the next two years will be critical for meeting this objective.

(U) As a first step, I propose that the Secretary General provide the paper to Permanent Representatives and recommend it be given to Deputy Secretary General da Rin, as Chairman of the Executive Working Group (EWG), for urgent action. In addition to our semi-annual ministerial review, I propose that representatives from capitals meet with the Executive Working Group to review progress at appropriate intervals between ministerial sessions.

(U) I urge your support in developing a coordinated, coherent, programmatic plan of action that will give substance to the desires expressed by Heads of State and Government last June. I look forward to reviewing progress on this initiative at the spring DPC Ministerial. At that time, I expect to provide some further reflections on those mission areas (e.g., maritime) and regions (e.g., mountain and cold weather) that have not been adequately covered here.

(U) I am furnishing copies to all our NATO colleagues.

Sincerely,



Executive Summary

Taking Advantage of Emerging Technologies to Improve Conventional Defense

I. Introduction

Summit leaders agreed last June that NATO should explore ways to take full advantage both technically and economically of emerging technologies, especially to improve conventional defense.

This paper, taking account of other efforts in NATO, suggests NATO exploitation of selected technologies for conventional land and air forces to improve deterrence and defense in Allied Command Europe, with principal application to the Central Region. It emphasizes weapons systems that could be fielded in quantity within this decade. Other regions and mission areas should be addressed subsequently.

However valuable the contribution of emerging technologies, they must not be perceived as substitutes for personnel, equipment, and the readiness and sustainability required for improved NATO defense. Nor should such improvements be viewed as a substitute for nuclear forces, which retain a fundamental role in NATO strategy. Effective implementation of NATO's Force Goals and resource guidance accordingly continues to be a matter of undiminished priority.

Effectively exploiting emerging technologies will likely require some incremental spending above current efforts, although resulting force improvements may permit savings in other programmatic areas, and several countries (in addition to the United States) are developing and plan to produce improved weapons.

II. A Probable Soviet/Warsaw Pact Concept of Conventional Land and Air Operations for Conflict Against ACE Central Region

A probable Soviet/Warsaw Pact concept for conventional land and air operations in a conflict against ACE Central Region centers on combined arms operations carried out by ground, air and missile forces. Ground units would deploy in echelons and employ operational maneuver groups (OMGs) early on in the battle for exploitation missions. Air operations would be used to degrade NATO's tactical air and nuclear capabilities and establish air supremacy. Key to the concept are (a) deep operations by fronts, rapidly penetrating and fragmenting NATO defenses and striking at deep targets; (b) air operations to neutralize NATO air and nuclear assets; and (c) air defense operations to prevent NATO tactical air power from massing firepower against Warsaw Pact forces.

III. Nature of a Battlefield At the End of the Decade

A battlefield would likely cover the full extent of ground and air space where forces were deployed, and active engagement would be possible on a near full-time and all-weather basis. Combat would be marked by intensity and fluidity of action.

Many basic weapons at the end of this decade will be much the same as those now deployed, but near real-time target selection and close integration between targeting devices and weapons will be required. Forces capable of engaging the enemy with controlled long-range firepower tailored to the various target classes will need emphasis, as will greater mobility and concealment of forces. Control of the air will be critical, as will secure, jam-resistant, survivable, and mobile command/control/communications.

IV. Concepts for Exploiting Emerging Technologies for Improved NATO Conventional Defense

NATO can enhance deterrence by demonstrably improving its capability to counter Warsaw Pact attacks against it. The challenges for NATO are to:

- hold against initial attacks

- disrupt follow-on force attacks

- generate numerous, effective tactical air sorties

- reduce the effectiveness of Warsaw Pact tactical air and missile forces

- see in depth, communicate with, and command and control forces in near real-time.

It will be important to exploit vulnerabilities of Warsaw Pact forces, including equipment and command and control. NATO degradation of the Warsaw Pact's command and control could disrupt their highly coordinated plans, restricting reinforcement in the forward areas and backlogging units in the rear where they would be susceptible to interdiction and long-range fire.

NATO forces must be able to see in depth into the area of operations of attacking Warsaw Pact forces, and attack quickly, accurately, and in depth. The ability to utilize information rapidly will be critical.

A two-fold revolution is occuring in technology for seeing and hitting targets. There is now emerging a virtually real-time, in-depth out to 100kms or more, surveillance/reconnaissance capability available to field commanders and a weapons capability to hit fixed or area targets with high effectiveness. Both are necessary -- but not sufficient -- conditions for improved defense. The missing link,

for full exploitation, will be command capabilities -- fully tested -- to obtain and process real-time reconnaissance, act on it in a timely fashion, and direct forces against lucrative targets.

The emphasis here will be on systems now being fielded or which can be fielded in quantity well before 1990, as distinguished from more distant technologies that involve greater uncertainties of feasibility and cost. New, unguided, area munitions (and other specialized munitions) can, in general, provide improved capabilities sooner and at less cost than more advanced terminally guided munitions, albeit a lesser improvement than that provided by terminally guided munitions. By way of illustration, there are emerging technologies for munitions that might improve the effectiveness of particular missions by as much as a factor of 3-5 times current capabilities (on a per-sortie or per-round basis) through improved area coverage, compared to more sophisticated "smart" or precision technologies that may offer further improvements by a factor of as much as 30-50 but involve greater uncertainties in terms of technical feasibility, cost, and time to field. However, with respect to certain critical fixed targets, emerging terminal guidance technologies may offer the prospect of all-weather, direct hits and the effective destruction of even hardened installations in the relatively near term and within manageable costs.

Munitions can have tailored effects, e.g., anti-armor, anti-personnel, anti-mobile systems, anti-surface-to-air missile (SAM)/radar, and anti-runway; others can be utilized in efficient attacks against hard, fixed targets, such as bridges and tunnels. Delivery systems include tube artillery, ground-launched ballistic and cruise missiles, air-launched missiles and glide bodies, and aircraft using low-level flyover drops. Drones or remotely piloted vehicles offer great potential as sensors and jammers.

A. Defense Against the First Echelon and OMG

Anti-armor systems, long-range artillery, and air-delivered munitions capable of targeting and defeating enemy forces can significantly improve NATO capabilities in areas suitable to maneuver warfare. While ground and air delivered, direct attack, precision guided munitions offer considerable promise, especially for fixed targets, area coverage submunitions, such as extended range anti-armor mines and cluster munitions, can provide increased capability sooner and at less cost. These submunitions can help defeat a combined arms attack by stripping away lighter duty combat and support vehicles, artillery, and air defense forces from attacking tanks. Improvement of direct fire anti-armor systems can have high payoff against the remainder. Here, improved time-of-flight anti-armor missiles can have an important payoff.

NATO must be capable of conducting combat operations against Warsaw Pact forces, day or night, in all weather conditions. Emerging infra-red and electro-optics technologies can provide improved passive capabilities for sensors and direct fire weapons sighting systems and complement the development of various active emitters such as moving-target indicator radars and counter-battery radars.

Air-to-air and ground-based air defense systems are critical in defending NATO forces and preventing Warsaw Pact air superiority over NATO ground forces and areas in which operational maneuver groups attempt to penetrate. Air defense must be able to defend against bomber and fighter-bomber aircraft, attack helicopters, and air assault forces.

B. Interdiction of Warsaw Pact Follow-on Forces

Attack of enemy follow-on combat formations would be important for the forward defense forces. The purpose would be to delay, disrupt, and destroy follow-on elements and thus create opportunities for decisive action by NATO forces engaged against the Warsaw Pact first echelon forces. The destruction of Warsaw Pact follow-on forces could reduce the force ratios that develop at the forward line to more manageable proportions. Delaying the arrival of enemy forces could provide the allies with the time to achieve buildup of full strength through the arrival of reinforcements. Altering the planned balance of force components (armor, troops, artillery, etc.) may make the relatively rigid Warsaw Pact command and control system unable to use unbalanced units effectively.

Interdiction of follow-on forces would include attacks against lines of communication and other logistic support and Warsaw Pact combat units, especially those that could be brought to bear on the battlefield within a few days. The purpose would be to disrupt and degrade the follow-on forces to the point where the combined arms capability of reinforcing units is greatly weakened. Targets would be situated primarily within 300kms of the forward line, with greater emphasis initially on those within 100kms or so.

Target Acquisition: Attacks against fixed targets to disrupt lines of communication, etc., can be preplanned and do not require real-time target acquisition. The allies would rely on multiple sources to acquire follow-on forces' interdiction targets and data integration systems to process the information. Advanced sensors could be deployed on airborne platforms. NATO tactical air forces could have the capability to acquire moving targets directly with advanced radar. Real-time digitized direct readout of the surveillance area within 100kms is technically available for tactical systems. Although advanced sensor technology does represent an important improvement over existing capability, problem areas are likely to remain, e.g., target discrimination, jamming, vulnerability to attack, and costs. Work remains to attain the capability for automated data handling in near real-time and to enhance survivability of the communication system connecting the

various nodes. Procedures for handling, prioritizing, and assigning targets have yet to be clearly expressed in NATO operational doctrine.

Weapons Delivery: Examination is needed of the synergistic effects of using extended range surface-to-surface missile systems along with air-launched weapons systems that can be provided near real-time target data from sensors. In the near term, direct-delivery systems and standoff missile systems could be employed against fixed targets or with wide-area-coverage submunitions; at a later date, these might be supplemented with terminally guided submunitions with infra-red scanning devices that provide high capability against both tracked and wheeled vehicles. Tactical aircraft can also deliver advanced anti-armor munitions. In the near term, unguided submunitions could be used to provide increased lethality against tanks and other armored vehicles. Other technologically promising munitions, such as missiles with lock-on-after-launch capability that allows aircraft to attack multiple targets even if the targets are not in line of sight of the attacking aircraft at the time of launch, may be feasible later in the decade.

Issues that need to be addressed include technological feasibility, cost, degree of sensor-weapon integration, and survivability of sensor platforms, aircraft, and the communication networks. Many of these items are at hand or nearly so, and exploiting that near term potential without undue delay is most important.

C. Improving NATO Counter-Air Capability

One of the basic Alliance air warfare missions is to counter Soviet air operations in the shortest possible time. Counter-air combat requires full integration of active and passive measures including air-to-air, ground-to-air, air base, and missile destruction capabilities. The effectiveness of the NATO counter-air posture will be, among other things, a function of the type aircraft, the associated radar, fire control systems, and aircraft armament, the number of aircraft dedicated to the basic mission, and the number of sorties that can be generated, as well as the ground-to-air, communications, identification, electronic warfare and data processing systems employed.

Improved defense of NATO air bases and improved short range air defense command and control Identification-Friend-or-Foe (IFF) will be important. Promising concepts such as fire-and-forget SAMs and netted radar, command and control (C2), and SAM sites could supplement existing ground based systems. Examination should continue of use of airborne early warning/Airborne Warning and Control System (AWACS) aircraft as a C2 back-up capability for NATO SAM systems.

The air-to-air mission would be significantly improved by an advanced medium range missile, IFF, jam resistant data link and voice communication, advanced airborne radars, and an advanced jammer.

In view of the threat and because NATO air defenses alone would not exact a high enough cost rapidly enough against Warsaw Pact air operations, the role of aggressive counter-air operations against Warsaw Pact air forces, including timely and effective attacks against Warsaw Pact airfields, should be explored.

Synergistic effects of using ground-launched missiles and NATO tactical aircraft with munitions to suppress area and point defenses, crater runways, inhibit repair, and destroy other high value targets at Warsaw Pact air bases need to be vigorously evaluated by the Alliance following development of a concept of operations by the NATO Military Authorities.

In the longer term, anti-tactical missile capabilities may be an essential element in gaining effective defense against the Warsaw Pact counter-air threat to NATO.

D. Improving Other NATO Command/Control/Communication/Intelligence (C3I) and Disrupting Warsaw Pact C3

1. Improving NATO C3I

As the complexities of command and control grow in reaction to modernization of control arrangements within Allied Command Europe and the growing Warsaw Pact threat, an enlarged and redefined command and control system should include the latest state-of-the-art technology. The resultant C3I system should be reliable (including being logistically supportable), survivable and interoperable. Appropriate emerging technologies which will contribute to these characteristics include digital transmission and switching systems, modern secure voice systems, extremely high frequency satellite communications systems, and adaptive high frequency communications, including spread spectrum and frequency agile systems. Additionally, new technology in microcomputer automated data processing support and distributed processing techniques will contribute to improved command and control. In many cases commercial or civil capabilities, such as European Post Telephone and Telegraph (PTT) systems, should be exploited and supported as an adjunct to military systems. PTTs could be used to improve the redundancy in Alliance long haul communications systems, thus enhancing communications survivability in a wartime environment.

2. Counter C3

NATO must simultaneously consider ways to disrupt the Warsaw Pact's ability to control its extensive force structure. NATO should extract the maximum advantage from technical superiority in order to offset our numerical inferiority. Electronic resources intelligently applied on the enemy's troop control can temporarily render his fighting forces less effective at a lower level of conflict than the commensurate direct attack on the forces themselves. Counter C3 activities should concentrate on the agreements, concepts, tactics, and equipment required rapidly to target and attack critical enemy command and control nodes. Much of the required weapons

technology is in hand, but the communications and automated data processing equipment required to employ effectively existing weapons against critical enemy C3 is lacking.

V. Further Steps

While this paper has described the nature of the changes that the exploitation of emerging technologies could make in improving the deterrent capabilities of NATO's standing forces in the ACE Central Region, much remains to be accomplished. In appendices, we describe some US technologies that we believe to be appropriate to improved capabilities; we know that other member nations have similar items in many areas. Cooperative efforts in these areas could be considered on a case-by-case basis, giving due consideration to protection of militarily relevant technology. Given the scarcity of research and development funds and the limited resources available for providing for the common defense, we need to avoid unnecessary duplication and cooperate in the development, testing, and production of these new munitions, systems, and components. We also need to investigate means for technological modernization of forces defending NATO's Flanks and maritime regions.