TOP SECRET

ANNEX A--THE ANTI-INFILTRATION BARRIER

General

(TS) Based on the studies conducted by COMUSMACV during the latter half of 1966 and early 1967, SECDEF directed the development, preparation, and implementation of an anti-infiltration system for SEA. The primary purpose of this system was to impede the flow of vehicles and personnel from NVN into RVN, and the target date for Initial Operational Capability (IOC) was set at 1 November 1967.

(TS) In order to control this mammoth undertaking SECDEF established a JTF under Director, Defense Communications Planning Group (DCPG) with the responsibility of developing, procuring, and providing to COMUSMACV the necessary elements of the system. The resources and deployment programs evolved from a series of plans which, by the end of 1967, called for an anti-infiltration system known as DYE MARKER/MUSCLE SHOALS. This system consisted of four subsystems which had reached varying degrees of completion by the end of the year.

(TS) The two DYE MARKER subsystems on the east were designed as ground supported systems, whereas the two subsystems on the west were to be air supported.

(TS) The easternmost subsystem was a ground barrier designated Strong Point Obstacle System (SPOS). It was to be constructed westward from the coast through Con Thien to the foothills to the west, and consist of five strong points, four support bases, 23 km of cleared obstacle line and personnel sensors. This subsystem was still under construction at the end of the year with IOC estimated to be 1 July 1968. The second subsystem, the Defile System (DFS) was to be a westward extension to fill the gap between the SPOS and the Laotian border, and to cover the natural avenues of approach from the DMZ into RVN. At year's end it was still in a conceptual stage.

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(TS) The two MUSCLE SHOALS air supported subsystems were to extend across the VN border into the middle of Laos. DUMP TRUCK, the anti-personnel subsystem included portions of Laos, southwestern NVN, and northwest RVN around the DMZ. It was comprised of mines and sensors laid and monitored by aircraft. DUMP TRUCK did not meet the planned IOC date, but was expected to reach that state of completion in January. MUD RIVER, the anti-vehicular subsystem was deployed in central Laos, in conjunction with other measures which were in being or planned, to block vehicular infiltration in areas where it was not practical to conduct conventional ground operations. It was comprised of mines and sensors laid and monitored by aircraft. MUD RIVER did meet the revised IOC date of 1 December 1967. Both of the air supported subsystems were to utilize aircraft as the strike weapon.

(TS) Although three of the subsystems had achieved various degrees of operational capability, this initial capability had certain limitations. It was too early to evaluate the effectiveness of the program and there were problems with munitions, sensors, and related surveillance, as well as with delivery equipment and procedures. As a result, a follow-on program was developed to improve equipment and procedures.

(TS) The requirements of a program for 1968 for improved infiltration interdiction were clear: completion of planned installations; improvement in sensor effectiveness and survivability; special munitions, accuracy in locating sensors and delivering special munitions, and data processing; and reduction of aircraft vulnerability.

Background

(S) Infiltration of enemy troops and supplies into RVN from NVN (occurring largely through Laos and across the DMZ) had increased steadily from an average of about two battalion-equivalents per month in late 1964 to approximately fifteen battalion-equivalents per month in early 1966. Concerned by

this rapid rise in the infiltration rates, and aware that the NVA was capable of increasing the rate, COMUSMACV had given careful attention to possible methods of limiting Communist infiltration into RVN. In 1966 considerable time and effort were spent in analyzing plans, providing raw data to other agencies, and particularly in assessing the possible impact of such plans on the overall strategy of the 1966 and 1967 Joint Campaign Plans.[1]

(S) Deputy Ambassador Porter had proposed in April 1966 that an extensive barrier be constructed extending from Saigon west through Hau Nghia Province to the nearest point (the "Eagle's Beak") on the Cambodian border. COMUSMACV studied the proposal, and in May informed the Deputy Ambassador that inasmuch as north-south commercial traffic would have to continue, the effectiveness of the barrier would depend entirely on the effectiveness of RVNAF control of personnel and cargo movement across the barrier. COMUSMACV considered that any diversion of military forces to man and secure the barrier would not compensate for the loss of their effective employment in offensive maneuvers. Additionally, construction of the barrier would divert engineer effort, equipment, and materials from other critically-needed operational facilities.[2]

(TS) In March JCS requested CINCPAC's views on a plan for an anti-infiltration barrier across northern RVN and Laos from the South China Sea to Thailand. CINCPAC studied the plan and pointed out a number of problems, including the large number of combat forces required before, during, and after construction of the barrier; the magnitude of initial and follow-on logistical support; the large engineer construction effort required; and the length of time needed to complete the project. CINCPAC considered that the existing logistic posture in SEA, particularly the available ports and land LOCs, would make the construction of such a barrier impracticable. CINCPAC also pointed out that reliance on such a barrier would shift the US and FWMA forces into strategy which would enhance the freedom of action of the enemy while denying the advantages of flexibility to friendly forces.[3]

(TS) Another barrier study, completed under DOD contract by the Institute for Defense Analysis, was published in August. This study considered an air supported anti-infiltration barrier extending

across RVN, near the DMZ, into Laos. The plan proposed a conventional linear barrier of barbed wire and mines extending from the South China Sea westward for approximately 30 km. Continued westward into Laos, this barrier would consist of an air supported anti-infiltration system, including anti-vehicular and anti-personnel portions to be seeded with acoustical sensors and area-denial munitions.[4]

(TS) In September JCS notified CINCPAC and COMUSMACV that they were considering a proposal which accepted, in principle, utility of an air supported barrier system across infiltration routes in RVN and Laos. The barrier would consist of two parts: one designed against foot traffic and the other against vehicles. The barriers would be achieved through use of large numbers of gravel mines, button bomblets, and acoustic detectors, supported by patrol, photo, and strike aircraft and supplemented by ground personnel to set detectors and plant mines. JCS indicated that its response to the proposal would probably take the form of supporting the principle of barrier potential, while recommending a broad study assessing all sensors, materiel adequacy, indicated R&D developments, and trade-offs between barrier efforts and competing demands on money, manpower and materiel. JCS asked CINCPAC and COMUSMACV for comments on the proposal, as well as information on any other barrier plans, proposals or studies in existence. In reply, COMUSMACV indicated that a MACV study had examined the logistical and operational effort required to seed and maintain a continuous barrier, and had concluded that except for trip-wire mines, such a barrier would be extremely difficult and costly to support logistically and operationally. COMUSMACV considered that a non-continuous barrier would be more easily supportable, and would be within limitations set by schedules, costs, and air-sortie resources. This reply indicated further interest in continued study of an air supported barrier system, and stated that it would have the full support of MACV. CINCPAC pointed out that although the establishment of an air supported barrier system astride infiltration routes in RVN and Laos might be technically feasible, its practicability should be considered further, as he doubted that such a barrier would impede infiltration--even initially. It was CINCPAC's opinion that maintenance of an air supported barrier might result in a dynamic "battle of the barrier," and that the introduction of new component

into the barrier system would depend not only on R&D and production capability, but would also depend on the capability to place the components in the right place at the right time. CINCPAC concluded that even if the US were to invest a great deal of time, effort, and resources into a barrier project, it was doubtful that such a barrier would improve appeciably the US position in RVN.[5]

(TS) On 15 September SECDEF appointed LTG Alfred D. Starbird, USA, Director of the Defense Communications Agency (DCA), to chair the Defense Communications Planning Group (DCPG) and to form Joint Task Force 728. The mission of the Task Force would be to "provide an infiltration interdiction system, to stop (or at a minimum to substantially reduce) the flow of men and supplies from North to South Vietnam. It is to be designed, produced and put in place in RVN and Laos as a matter of highest priority. . . . You [LTG Starbird] are hereby named Director of JTF 728 to achieve the objective of having the system installed and in operation by September 15, 1967." This directive formally established what was to become known as Project PRACTICE NINE.[6]

(TS) During the visit of SECDEF to RVN in October 1966, COMUSMACV suggested, as an alternate to previous recommendations, that a conventional barrier be constructed all the way across RVN and be augmented by selective use of air delivered munitions and sensors in Laos. At the request of SECDEF, this concept was refined into a Requirements Plan which was based on the premise that additional forces, over and above other MACV force requirements, would be provided for barrier construction and manning. In November, however, JCS informed CINCPAC and COMUSMACV that additional forces could not be made available to meet the requirements of the barrier plan, and that MACV should plan to meet all PRACTICE NINE requirements from within approved in-country strengths. In consideration of this message, which effectively invalidated MACV's Requirements Plan, COMUSMACV prepared a message to CINCPAC on 21 November 1966 to make his position completely clear:

> For some time I have been considering the installation of a barrier, depending on the availability of resources, competitive requirements for these resources, the enemy situation and

other factors. In discussions with SECDEF on 10 October, a proposal for a multinational force was discussed with the idea of establishing a barrier at a later date. Such barrier implementation should not be geared to a rigid time frame as outlined in the proposed plans. Further, I have never supported the prescribed plan air barrier concept in Laos, but rather the selective use of special munitions, as they become available, to augment existing interdiction programs in Laos. However, in my memorandum of 5 November to GEN Starbird, I did concur in proceeding until 1 April 1967 on the basis of readying the means set forth in the prescribed plan, noting decision could be made then as to the basis on which further preparations would go forward.

MACV prepared a plan to identify requirements necessary to construct and man a barrier system within an attainable time frame (Nov 67 for the ground barrier, and Apr 68 for the intensified interdiction operations in Laos), using additive forces. . . . This plan outlined a basic assumption that additive forces would be required; if this assumption is invalid, the plan is invalid for the time frame involved.

It is not my intention, nor has it ever been, to displace in-country forces of the magnitude required to meet total barrier requirements. Rather, I consider it essential that the commander in the field maintain complete flexibility and utilize resources provided him for the benefit of the overall mission. This philosophy is projected throughout the Combined Campaign Plan for 1967 recently signed by General Vien, Chief, RVNAF JGS, and myself. This plan directs increased emphasis by both ARVN and US/FW forces to provide military support to Revolutionary Development (RD). The primary function of the military in support of RD is to attain and maintain the requisite level of security so that RD programs can be accomplished by GVN civil elements. To withdraw military forces of the magnitude required for the barrier would not only reduce RD planned for 1967, but could well result in the collapse of programs already underway in areas from which forces are withdraw

It is necessary to point out that I strongly oppose a commitment to create and man a barrier of an inflexible time schedule. Any further actions toward establishing a barrier must be based on current intelligence and the enemy's action throughout SVN. Current developments indicate that establishment of a physical barrier can be delayed. At present, only about 5% of total enemy infiltration from NVN passes through the DMZ. Further, friendly forces now in positions south of the DMZ have prevented major enemy gains. I shall wish to weigh any further actions vis-a-vis the barrier against the overall situation in the country. By the same token, we should not redeploy major forces within SVN for a barrier unless enemy pressure demands it. It is conceivable that in the future this could well happen due to the success of our blocking actions in Laos.

In summary, I am unable to concur in meeting all PRACTICE NINE requirements from approved in-country assets alone. I consider it essential that an inflexible time schedule be avoided, that a realistic approach be taken toward construction of a physical barrier consistent with the overall MACV mission, and that freedom of action by the commander in the field be preserved. Finally, I must underscore the fact that I have on no occasion recommended nor concurred in a barrier undertaking governed by the parameters cited in Msg (TS), JCS to CINCPAC, 180059Z Nov 66, Subj: JTF 728 Project Definition Plan.[7]

(TS) CINCPAC on 23 November relayed COMUSMACV's views to JCS, agreeing in general with the former's position:

Strongly concur in COMUSMACV's views on the barrier as expressed. . . . Most particulary, a realistic approach must be taken with respect to the construction of a barrier that is in consonance with the overall COMUSMACV mission. The barrier would have to be established in such a manner as to preserve the commander's freedom of action to meet

military contingencies and to avoid jeopardizing other essential operational and logistic undertakings. The proposed 1 April 1967 review of infiltration patterns that will have occurred during the winter Laotian dry season is considered essential to provide a basis on which further preparations could go forward.[8]

(TS) On 19 December SECDEF directed JTF 728 to prepare a plan which would provide for procurement of materials for the linear section of the barrier so as to be in-country by July 1967, but without commitment as to when they might later be used. For the air supported capability, JTF 728 was to develop and prepare the aircraft elements and other resources unique to the air supported capability, on a schedule to permit operational availability in-country by 1 November 1967. Readying for this date was not to constitute a decision as to deployment. The plan was prepared as a memorandum for SECDEF from Director JTF 728, dated 22 December 1966, and indicated the approach and time schedule to be followed, funding and personnel ceiling requirements, and actions requiring immediate decisions by SECDEF.[9]

(TS) By the end of the year 1966, COMUSMACV and CINCPAC were preparing a two-part plan for JCS to present to SECDEF in accordance with the 22 December JTF 728 plan. The first part, providing for interdiction of infiltration through the area contemplated for the conventional linear barrier, was due in February 1967. The second part, covering the air supported interdiction capability, was to be completed by April 1967. At the same time, JTF 728 was concerned with its responsibilities for developing the air supported capability, and for supervision of research, development, testing, evaluation, production, and delivery of barrier system components.

Concept Development During 1967

(TS) The considerable and ongoing effort which already had been committed to improving anti-infiltration measures continued and began to take shape in early 1967 when, on 13 January, President Johnson approved assigning the PRACTICE NINE Program the highest national priority category. On 26 January, after detailed study, COMUSMACV

completed the MACV PRACTICE NINE Requirements Plan which JCS planned to submit to SECDEF in February. The plan provided concepts and estimated requirements to support an anti-infiltration system to be installed in northern Quang Tri Province. The concept envisioned a series of strong points and fortified base areas which could be constructed near the DMZ by tactical troops assisted and supervised by organic engineer units. Forward of the strong points a series of barbed wire and minefield obstacles would be laid to deny the enemy likely avenues of approach and to canalize his movements. Sensor/detector devices, night observation devices (NOD), infrared intrusion detectors (IID), Xenon searchlights, and radars were to be employed to detect enemy presence. The strong points and base areas would occupy key terrain features and serve both as patrol and fire support bases. Extensive air and ground patrolling was considered essential to detect signs of intrusion as well as to maintain contact with the populace in the surrounding areas. On-call, pre-planned artillery concentrations would cover the area, and tactical air as well as naval guns within range would be available on short notice to strike known or suspected targets. Helicopters and other available means would lift mobile reserves and strike forces from rear areas to block enemy penetrations or destroy intruders. All civilians would be relocated from the area in the vicinity of the obstacles, strong points, and forward base areas. Maintaining his earlier reservations regarding the concept, COMUSMACV noted in the plan that the term "barrier" should not be employed since it gave the connotation of an impregnable defense against infiltration which he felt impossible to attain without massive deployment of troops. His plan called for minimum additional forces of one division and one armored cavalry regiment and reiterated the use of an international task force for this purpose. He suggested the name "Tu Do" for this task force since, in Vietnamese, this means "freedom." Another innovation espoused by COMUSMACV in this plan was the development of Route 9 into an international highway running from the South China Sea across Laos to Thailand. For this he suggested the name "Pan Sea Pike." In the letter forwarding the MACV Requirements Plan, COMUSMACV stated:

> .....The enclosed plan would meet the requirements by 1 Nov 67. However, I do not consider the end result to be the final solution to stopping infiltration. An obstacle or barrier system must be

regarded as only one of many anti-infiltration programs. A proper balance of all these programs must be preserved to prevent undue reliance on any single system.[10]

(TS) As refinement of the strong point/obstacle system planning gained momentum, COMUSMACV prepared a second plan requested by JCS for presentation to SECDEF. The MACV PRACTICE NINE Air Supported Anti-Infiltration Plan was published on 11 March. This plan provided for establishing and maintaining an air supported anti-infiltration system primarily in Laos, to the west of the ground emplaced strong point/obstacle system, but capable of being extended into western Quang Tri Province in RVN.

(TS) Interdiction operations had been underway in Laos for some time and were successful in limiting the flow of vehicular traffic; however, infiltration of enemy forces on foot continued at a high rate primarily because of the concealment provided by the jungle, the multitude of routes, and the lack of friendly ground forces to block these routes. Since friendly ground forces did not operate in sizable numbers in Laos, the interdiction of men and supplies would have to be accomplished by air. The plan envisioned expanding the interdiction of vehicular traffic by employing newly designed air emplaced sensor and monitoring devices on all potential vehicular routes within the area. Air delivered mines would be used on a selective basis to delay, damage, and fix in place the traffic at points where it could be most effectively attacked. More specifically, the elements of this interdiction system would include: point interdiction to cut the lines of communications by use of heavy air delivered weapons, anti-vehicular mining operations, and vehicular sensors. Where significant personnel infiltration had occurred or could logically be expected to occur, and where conventional ground operations were impractical, an air supported personnel interdiction system was to be installed and operated. Elements of this system would include anti-personnel minefields and personnel sensors, both seismic and acoustic, which would be air delivered and air monitored.

(TS) In forwarding this plan, COMUSMACV stipulated: "Several immeasurable and intangible factors dictate requirement for a flexible plan which can be modified readily without sacrificing the overall

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objective. These factors include: unknown effectiveness of munitions and sensors (most of which are still in the research and development stage); the unknown reaction of the enemy; and the reaction of the governments of RVN, Thailand, and Laos whose willing cooperation is necessary to the success of the plan." Additionally, COMUSMACV emphasized that such a program should include a detailed plan for helicopter and ground team emplacement of special munitions and sensors, that it be oriented toward augmentation of current and projected anti-infiltration operations, and most certainly consider necessary changes to current rules of engagement to improve effectiveness.[11]

(TS) CINCPAC's comments, recommendations, and identification of possible problem areas relative to MACV's air supported anti-infiltration plan were recorded on 3 April; it was apparent that some of his observations were due to a planned implementation date of 1 November 1967. CINCPAC pointed out, as had COMUSMACV, that present programs were based on valid concepts, were accomplishing the interdiction of enemy infiltration, and that implementation of the new concept should be considered as complementing and reinforcing. The focal point of the new program depended on an intensification of effort in current programs combined with the orderly and judicious integration of the new concept. Of primary concern were four points: (1) since sensing devices under development could not distinguish between friend and foe or civilian and military, substantial modification to rules of engagement, particularly in Laos, would be necessary due to the possibility of inadvertent strikes on friendly and civilian targets by employing air in reaction to sensing device information; (2) in reference to Thailand, "The spectre of infiltration penetrating Thailand" in an attempt to outflank the system may pose serious political and military problems; (3) the possibility of a gap developing between the air supported plan and the strong point/obstacle portion of the anti-infiltration system; and (4) preliminary studies indicated that the aircraft attrition associated with the plan could present a problem of serious magnitude. CINCPAC recognized the fact that the anti-personnel portion of the air supported plan could be installed initially as an in-country operational test and subsequently, "if the effectiveness of special devices and munitions are demonstrated, the full operational capability can be exploited and extended into northwest Quang Tri Province as required."[12]

(TS) Following CINCPAC's drawing attention to a possible gap developing between the air supported plan and the strong point/obstacle plan, requests flowed from JCS thru CINCPAC to COMUSMACV to supply an answer to such a contingency. In defense of the two plans submitted earlier in the year by his headquarters, COMUSMACV noted:

> Careful consideration was given to concepts for intensified anti-infiltration operations in western Quang Tri Province. Constraints imposed by the selected operational capability date of 1 Nov 67 narrowed the courses of action available for consideration. The principal constraint was the logistics and construction support necessary in the very limited time frame... Priority of effort prior to 1 Nov would be placed on eastern Quang Tri Province, where there exists the threat of invasion by large enemy units. Current operations in western Quang Tri Province, such as long range patrolling, CIDG camp operations, and H&I artillery programs will be continued and intensified as the priority of operations and forces available in I CTZ permit....MACV favors the use of strong points as patrol and fire support bases, use of complementing obstacles and sensor devices, and use of mobile forces as a more effective means of impeding infiltration and detecting invasion of this area.[13]

(TS) SECDEF had directed the development of an infiltration interdiction system for SEA to impede the flow of vehicles and personnel overland from North Vietnam to South Vietnam and further that certain preparations for the system go forward immediately. These preparations consisted initially of designing, testing, and developing equipment for a linear array of strong points and obstacles; acquiring and readying the resources for an air supported interdiction capability to be usable against personnel or vehicles or both; and developing plans for their use. In order to carry out these preparatory missions and provide for a smooth transition into the deployment and use of the capability as well as to provide a

common understanding of operational concepts, JTF 728 published the PRACTICE NINE Technical Design and Development Plan on 30 April 1967. Included in the plan was a delineation of the responsibilities of JTF 728, CINCPAC/MACV, and the Military Departments:

> JTF 728 is responsible for: (1) preparing and providing to CINCPAC/MACV Practice Nine resources which are approved by SECDEF...; (2) accomplishing the overall system planning and engineering.... To the greatest degree practical, the JTF will task the Military Departments to accomplish detailed engineering, design and test of the systems elements; (3) tasking Military Departments and agencies outside of DOD as necessary to accomplish the work of developing system resources; (4) overall program review and reporting to SECDEF.
>
> CINCPAC/MACV will plan and employ the Practice Nine resources in such manner as to best accomplish their infiltration interdiction mission. They will review all resources, readying plans of the JTF and advise the JTF, JCS or SECDEF, as appropriate, of changes required.
>
> The Military Departments are responsible for conducting research, development and testing to find ways to improve the Practice Nine capability. They will accomplish specific research, development, procurement, and deployment tasks assigned by JTF 728.[14]

The Technical Design and Development Plan was the most complete single source of information pertaining to PRACTICE NINE. While holding the plan in high regard as an excellent source of reference for all facets of the project, CINCPAC and COMUSMACV felt that there were several points requiring modification and made the following comments: (1) the concept and dimensions of the anti-personnel zone should not be as defined in the plan since the zone would be in actuality based on the tactical situation existing at the time of emplacement; (2) aircraft basing requirements spelled out in the plan had not yet been firmed; (3) the requirement for a

new reporting system appeared to be unnecessary considering that adequate system for control of shipments, priority handling, munitions expenditures, etc., were already operational within CINCPAC and (4) it was further noted that much of the information in the plan was perishable and of the "quick change" variety; therefore, some difficulty may be experienced in keeping the plan current.

(S) In June a partial compromise of the classified meaning of the nickname PRACTICE NINE occurred. As a result, on 13 June, DCS directed that the use of this nickname be discontinued in any unclassified context, and the nickname ILLINOIS CITY was assigned to be effective until 2400H 14 July 1967 when the nickname DYE MARKER was to become effective. To insure clarity, due to the transitory nature of the nickname, "ILLINOIS CITY" will not be used herein.

(S) In October 1966 GEN Starbird had expressed a desire to establish liaison offices at MACV and CINCPAC, and both offices were operational by the end of the year. As concept development of the air supported anti-infiltration system progressed, the political, logistical, and tactical implications pointed up a need for an additional liaison office, and, in July 1967, a third liaison office in MACTHAI was established to coordinate DCPG matters in Thailand. Although no formal charter agreement for the liaison office in USMACV was ever developed, it was understood that its mission was to provide direct liaison for the Dir DCPG with COMUSMACV and, when required, with III MAF, 7AF, and USNAVFORV. It was to consist of a chief (AF officer), three action officers, and one enlisted man. The Chief DCPG Liaison Office was responsible for representing the Dir DCPG at meetings, briefings, and conferences as requested by MACV; providing to MACV information on DCPG planning; coordinating with MACV on matters of command support of the DCPG mission; providing assistance to MACV staff in interpreting the DCPG mission, plans, and directives; and monitoring certain aspects of the DCPG plans when requested by MACV, e.g., maintaining statistics on unit and logistical items arrivals.

(S) In February 1967, during a visit to Vietnam, Dir DCPG was informed of COMUSMACV's concern about how to "bridge the gap" between requirements planning and operational planning for the employment of PRACTICE NINE air supported resources.

COMUSMACV stated that he would like to integrate some DCPG personnel into the MACV staff, and Dir DCPG agreed. It was felt that some work being done in part in DCPG could better be initiated by MACV Headquarters and components. Personnel from DCPG could provide important assistance. The tasks involved included determining possible locations for employment, establishing flight and ground patterns, determining intelligence information to be furnished the Infiltration Surveillance Center (ISC), integrating the ISC within TACC, developing delivery tactics and techniques, evaluating effectiveness, and developing logistic plans. To provide continuity of planning, Dir DCPG proposed transfer of 19 selected officers and spaces from DCPG to MACV. The proposal was approved by SECDEF and by the end of July the officers had arrived in-country.

(TS) In briefing SECDEF on 7 and 8 July COMUSMACV described his concept of integrating PRACTICE NINE into the existing command structure. CG III MAF would have operational control of the strong point/obstacle system in I CTZ, and Cmdr 7AF would have operational control of the air supported anti-vehicular and anti-personnel subsystems as an extension of the existing STEEL TIGER Task Force. It was COMUSMACV's opinion that this was consistent with the natural growth of the TIGER HOUND tasks of the MACV air component command. COMUSMACV continued that areas of mutual interest between III MAF and 7AF would be closely coordinated through direct communications channels. A special task group was organized at Nakhon Phanon, Thailand to provide an on-the-scene agency responsible for coordinating all forces operating in the STEEL TIGER area including PRACTICE NINE. The Special Task Group would, using the specialized capability of the ISC, gather intelligence, determine and coordinate mission requirements, and recommend delivery of strike, sensor, or specialized munitions to 7AF. Requests for diversion of aircraft for immediate strikes were to be passed to an Airborne Battlefield Command and Control Center by the Special Task Group. To insure an integrated effort, provisions were made for joint staffing of the Task Group, which was to be headed by an Air Force brigadier general.

(S) In August COMUSMACV appointed a project manager for DYE MARKER. The Office of the Project Manager was designated

Special Operations (J33) and assumed the DYE MARKER responsibilities of the Special Projects and Analysis Branch. (J344).

(S) On 21 August CJCS sent a memorandum to Dir DCPG spelling out the responsibilities of the Cmdr 7AFTF, as defined by GEN Westmoreland, and further defining the responsibilities of DCPG in overall direction:

> As Commander of the 7th Air Force Task Force, General McBride will be the operating manager of the air supported DYE MARKER system. In this capacity, he will manage the entire interdiction effort for the 7th Air Force in the air supported area of interest, TIGER HOUND area of Laos, and possible small portions of NVN and SVN near the demilitarized zone. He will have full authority for directing all infiltration surveillance activities conducted in his area by the 7th Air Force and all other MACV forces and will act as 7th Air Force coordinating authority for surveillance forces employed under other commands. He will direct the employment of surveillance/reconnaissance aircraft (including FAC's) and surveillance teams. Based on the intelligence information gathered at the Surveillance Center, which is part of the task force, he will select the targets and recommend the employment of strike forces allocated for strikes in his area by the 7th Air Force Tactical Air Control Center (TACC). He will also specify the employment of ground action teams available to his area from MACV resources.
>
> I have discussed General McBride's proposed duties, as outlined above, with the Secretary of Defense. I also outlined to Mr. McNamara General Westmoreland's plans to appoint a brigadier general from within country to be a focal point on the MACV staff for all actions concerning the DYE MARKER program. In both cases, he is in full agreement.

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However, the Secretary of Defense emphasized his desire that you continue to exercise overall direction of the continuing support effort which will be requisite to the success of the DYE MARKER program. Your responsibilities would include conceptual planning; research, development, and test of improved concepts and hardware; timely procurement of resources to be made available to the theater commander; and other similar actions which do not infringe upon established command arrangements. Along these lines, I assume that you will continue to maintain liaison groups within the theater to assist you in these matters.[17]

(TS) At the Southeast Asia Coordinating Committee (SEACOORD) meeting on 1 August attended by Ambassadors Bunker, Martin, and Sullivan, as well as ADM Sharp and GEN Westmoreland, considerable concern was expressed about the apparent absence of field coordination in the development of DYE MARKER operations. Although it was intended that a good portion of the system was to be deployed in Laos and staged through Thailand, both AMEMB Vietiane and AMEMB Bangkok representatives learned of several elements of the proposed operation for the first time during the meeting. As a result COMUSMACV took immediate steps to create a working group in Saigon and urged the Ambassadors to Thailand, Laos, and the RVN to provide full time representatives. On 6 August COMUSMACV recommended to CINCPAC that an executive directive be issued to all involved government agencies establishing guidelines for approaching the governments of Thailand, Laos, and Vietnam and fixing responsibility on the US Missions to these countries to insure that specific parts of the DYE MARKER program would be carried out. In stressing the importance of this step and to further clarify possible misunderstandings, COMUSMACV stated his belief that, from a military point of view, DYE MARKER could not supplant or substitute for ROLLING THUNDER and other bombing/air interdiction programs. He pointed out that the locations of the anti-vehicular and anti-personnel subsystem were not yet firmly established, but that locations would be dictated by timely intelligence and availability of munitions and sensors. COMUSMACV cautioned that if Thai cooperation were withdrawn, the effect would be indefinite postponement of the planned initial operational

capability (IOC) date and complete reevaluation of the DYE MARKER system.[18]

(U) On 7 September, as a result of speculation in recent news stories on anti-infiltration systems around the DMZ, SECDEF made a public release:

> As you all know, we have for two years or more been examining into the possibilities of using ground obstacles and other devices to help impede the flow of men and supplies into South Vietnam. Many persons, some inside the Department of Defense and some in research organizations outside the department, have recommended different proposals.
>
> Some of these proposals have been examined in detail and discarded. Others appear to have more promise. You are all aware that work has begun on clearing the jungle south of the DMZ for a stretch of roughly 15 miles. We are preparing to initiate late this year or early next year the operation of a system to make infiltration more difficult. The system's objectives will be consistent with those of our air campaign against the lines of communication. We know, of course, that no obstacle system can stop the infiltration of personnel or supplies.
>
> Equipment to be installed will range from barbed wire to highly sophisticated devices. The more the enemy knows about our plans, the more ready he could be to defeat the system when it is installed. Therefore, I am directing that no additional information be made public by anyone in the Department of Defense on this program.

(S) As a result of this public release and the expected focus of attention by the press on the strong point/obstacle area, and because the nickname DYE MARKER was in wide use in the III MAF area to identify offices, telephones, etc., DCPG felt that the meaning of DYE MARKER would soon become public knowledge. To preclude consequent compromise of the entire anti-infiltration system, instructions were issued that the nickname DYE MARKER would pertain only to

the strong point/obstacle system. The remaining two subsystems, now requiring new nicknames, became DUMP TRUCK for the air supported anti-personnel and MUD RIVER for the air supported anti-vehicular subsystems; collectively, these two subsystems were nicknamed MUSCLE SHOALS.[19]

Strong Point Obstacle System

Developing the Plan

(TS) The MACV PRACTICE NINE Requirements Plan was presented to SECDEF in February 1967 and, on 6 March, he directed JTF 728, to procure for delivery on schedules acceptable to COMUSMACV, materials for strong points and base camps and sensors and surveillance devices for a 10 km section; take necessary steps to insure that Route 1 and Hue Port were unobstructed; arrange for the State Department to secure GVN support for land acquisition and civilian relocation; and, in conjunction with State Department, to ascertain the feasibility and desirability of integrating the Tu Do Task Force and Pan Sea Pike concepts with PRACTICE NINE. He further directed that other measures be taken to preserve a 1 November 1967 operational capability.[20]

(TS) Now having a plan that he considered practical, COMUSMACV took two preparatory steps prior to proceeding with actual construction: he directed CG III MAF to prepare a detailed plan to proceed and he personally made initial overtures to GVN.

(S) On 26 March COMUSMACV, desiring that a start be made as soon as possible on a Strong Point Obstacle System (SPOS), defined that system as one running along the southern edge of the DMZ extending from the sea to a point about one-third of the distance to the Laotian border. He also directed CG III MAF, in coordination with CG I CTZ, to prepare a plan "as a matter of urgency" to locate, construct, organize, and occupy a strong point obstacle line. This plan was to include recommended task organization with US and ARVN units for both construction and occupation of the system. The plan was to address the subject of displacement

of persons occasioned by construction of the system, and to includ relocation areas as well as land clearing requirements for resettl ment and cultivation for the displaced persons.[21]

(TS) On 16 March General Loan, the Director General of the National Police, met with GEN Westmoreland and stated his conce for the safety of his police in the DMZ because of the VC/NVA cap bility to harass the police. The police were without mortars or oth heavy weapons with which to defend themselves and, even worse, d not have radios to call for air strikes or artillery when under attac In reply, COMUSMACV revealed the possibility of constructing an obstacle system in that area, to which General Loan was most enth siastic.

(TS) On 17 March at III MAF Headquarters, COMUSMACV me with Generals Thieu, Phong, Lam, and Loan to explain his plan. The plan was enthusiastically received, and General Loan stated that construction should begin right away taking advantage of the dry season. COMUSMACV expressed his advocation for use of an international force but felt that for political reasons General Loan should bring up the idea with General Ky. It was the opinion of the GVN representatives that implementation of such a plan posed no problems, political or otherwise. COMUSMACV also suggested tha although MACV would assist, clearance of land which might be used for cultivation to ease the problems of civilian relocation from the area and the use of mass labor for improving LOCs should be a GVN program. When contacted, Premier Ky stated that he would confer on the matter with President Johnson at their meeting on Guam. However, since the subject did not come up during the conference on Guam, SECSTATE informed the AMEMB Saigon that resolution should be achieved by COMUSMACV and AMEMB Saigon through the Mission Council. SECSTATE also felt that "mention to GVN of the overall planned interdiction system including the air-laid capability and extension into Laos should be avoided. . . you may, however, say that we are studying the problem of extension westward to the Laos border."[22]

(TS) Two significant coincidential actions occurred on 15 April when Premier Ky, during a press conference at Bien Hoa Air Base, stated that a defense perimeter south of the DMZ would be construc and that new Allied and Vietnamese forces would be necessary for t DMZ. At the same time SECSTATE wired AMEMB Saigon that SEC

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was anxious to move ahead as rapidly as possible on first stages of preparation and would like an estimate of when GVN approval might be obtained. Following these simultaneous actions, Ambassador Lodge and COMUSMACV, on 17 April, discussed construction of such a military system of obstacles and strong points with Premier Ky. They informed the Premier that, if he agreed to such a project, the US was prepared to furnish the mines and other materials for the system and would commit military personnel to man part of the system. The Ambassador added that the US favored an international composition of forces and suggested that an appeal to certain countries for additional troops might be appropriate. The Premier approved the overall concept and dispatched proposals to the heads of governments of troop contributing countries that they provide additional troops to help man a SPOS in Quang Tri Province along the DMZ.

(TS) The same month, JCS requested CINCPAC comments regarding the proposition for a multinational force. CINCPAC considered the idea worth pursuing but stated there were some questions regarding the capabilities and willingness of troop contributing countries to provide the additional forces for the purpose stated. He believed that the force should be strong enough to deploy and fight as an independent unit and should not be dependent upon other ground forces except when forced by superior numbers. Considering that placing an international force of inadequate strength in a position of jeopardy might prove embarrassing to the US, he felt it would be desirable that the overall force be no less than a division-sized unit with aerial support for reconnaissance. CINCPAC considered that a ROK contribution would be most hopeful, a Thailand contribution might be possible, and additional force contributions for Australia, New Zealand, and the Philippines would be doubtful though desirable. CINCPAC in turn solicited COMUSMACV's comments, to which COMUSMACV replied:

> There are a number of advantages, primarily political and psychological, to forming and positioning a multinational force south of the DMZ; however, these advantages do not . . . outweigh the disadvantages if the use of forces presently in-country is required. The diversion of forces from current

operational areas, the loss in flexibility in employment of these forces, and the lack of any assurance that the multinational force could prevent enemy buildup in SVN militate against the forming and positioning of the force. The proposed letter from Premier Ky to heads of governments of troop contributing countries requests additional troop commitment to SVN. Should sufficient additive forces become available as a result of this letter, it would be advantageous to form and position the additive multinational force south of the DMZ.[23]

Program Takes Shape

(TS) By the end of April CINCPAC summarized the activities t date as including the preparation and acceptance of the 26 January MACV plan, commitments to Premier Ky, GVN indorsement of the plan, III MAF planning responsibilities, and, the fact that some clearing had actually begun, employing US Marine and ARVN units. It appeared to CINCPAC that the work in progress was taking place considerably to the south of the intended area and would require relocation of thousands of civilians. The question then perplexing CINCPAC, which was posed to COMUSMACV was: "What relationship, if any, does present activity south of the DMZ have with respect to MACV plan of 26 January 1967?" COMUSMACV replied that:

> The present activity south of the DMZ is divorced officially from PRACTICE NINE... The present undertaking is a modest effort to clear fields of fire and to install a limited obstacle system. However, as time, security conditions, forces, and materials permit, the system could be improved to conform to the PRACTICE NINE concept. The planned locations fonform to the PRACTICE NINE Plans.[24]

(TS) In development of the SPOS the concept was, in those area the terrain and tactical situation would permit, to construct an inst

consisting of conventional equipment such as barbed wire, mines, and flares. In addition, a series of newly developed sensors and surveillance devices would be installed. For the primary sensor, a Balanced Pressure System (BPS) was planned. It consists of parallel liquid-filled hoses buried in the ground and connected to flexible disc transducers which respond to pressures on the surface of the earth. The alarm would be transmitted to observation posts by wire or radio. Unattended Seismic Detectors (USD) consist of five buried sensors (geophones), a buried electronic component, and a remotely located annunciator. The geophones are connected to the electronic component by buried field wire, and the electronic component connected to the annunciator by buried cable. Ground vibrations caused by surface motion are sensed by the geophones which transmit alarm signals to the annunciator. Alarm displays at the annunciator can be either visual, aural, or both. The Infrared Intrusion Detector (IID) is a line-of-sight device consisting of an IR source which illuminates an IR receiver from a given distance. The IR source would be aligned so that its beam will focus on the IR receiver, which may be up to 400 feet away. A break in the beam would result in the wire transmission of a signal to the annunciator which would contain audio and visual alarm indicators and a counter. All equipment would be powered by self-contained batteries, small in size, and buried in the ground. IID was particularly well suited to river, canal, and stream crossings, but line-of-sight and heavy fog limited the range. AN/PPS-5 and AN/PPS-6 combat surveillance radars were planned to be used to detect intruders. The AN/PPS-5 is a pulse doppler radar mounted on a tripod and equipped for either on-location or remote operation. The radar was capable of area surveillance with a personnel detection range of 5,000 meters and a vehicle detection range of 10,000 meters. Both audio and cathode ray tube displays are used. The AN/PPS-6 is a lighter pulse doppler radar used by patrols, and having a maximum personnel detection range of 1,500 meters and vehicle detection range of 3,000 meters. Night Observation Device, Medium Range (NOD MR) is a tripod-mounted telescope which operates passively with reflected light from stars, moon, and night sky glow in the visible and near infrared regions. NOD would be used at surveillance outposts supporting the system. The viewing range of the NOD is at least 1,200 meters in moonlight and 1,000 meters in starlight. The jeep-mounted Xenon Searchlight provides a capability for either visual or infrared surveillance around strong points and along the obstacle trace.

The approximate viewing range in the visible and infrared mode is 1,500 meters and 1,000 meters, respectively.[25]

(S) In mid-April the DCPG Bill of Materials (BOM) was receive it included delivery schedules and breakout of materials to be procured by Service components. The list was essentially as stated in the MACV BOM in the Requirements Plan; however, some difference were identified and action was taken in coordination with III MAF to resolve them. Some of the materials required in the SPOS were available in-country and were transferred to NAVSUPPACT Da Nang. Other materials were funded by DCPG and shipments to RVN initiated during the 4th Qtr of FY67. Shipping schedules established to support the planned installation called for shipments between April and September and, although actual shipment of some items slipped their schedules by up to 60 days, all phases of construction were permitted to begin using some items already available or substitute materials from in-country assets.

(TS) The MACV PRACTICE NINE Requirements Plan of 26 January 1967 enumerated additional troop requirements to man an effective obstacle system spanning Vietnam. An additional division (reinforced with certain in-country elements) would be required to occupy the system and an additional armored cavalry regiment would be required for a highly mobile reserve and route security force. It was considered in the plan that an obstacle system was likely to be completed from the South China Sea to Dong Ha Mountain in northern Quang Tri Province, a distance of 30 km, by 1 November 1967, and that, to man this portion of the system, a three battalion brigade (constituting the first increment of the division) would be required by 1 August 1967. Besides the brigade, an additional armored cavalry troop, engineer company, support battalion, 105mm towed howitzer battalion, and an aviation company also would be required, for a total additional force of 4,460 men. Other needed support units, augmentations, and construction battalions would raise this figure to 7,691. Not considered in this figure were MACV resources already in-country which would be used to support the plan: two Army field artillery battalions (one 175mm gun, and one 105mm howitzer), an Army light equipment company, three Naval Mobile Construction Battalions (NMCB), an Air Force heavy repair squadron, and a Marine engineer battalion. ARVN's contribution was fixed at elements of an engineer group and a regimental task for

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All units would contribute to security forces and it was assumed that enemy activity would not require major reinforcement into northern I CTZ.[26]

(TS) On 23 March, in reply to a SECDEF request to recommend the forces required to support PRACTICE NINE, JCS proposed an augmented initial force of 8,353 personnel. The units, which would deploy between April 1967 and August 1968, were a mechanized infantry brigade, an aviation company, two truck companies, an NMCB, an augmentation to the Naval Construction Regiment (NCR) staff, two LSTs, six LCUs, as well as assorted support platoons and detachments. With certain exceptions, SECDEF approved the JCS recommendation and directed that Program 4 be revised to reflect an increase of 7,522 in the deployed strength in RVN and 300 in the off-shore Navy strength. While SECDEF tentatively approved the mechanized brigade proposed by the JCS, he noted that COMUSMACV had requested an infantry brigade and directed JCS to study the feasibility of converting the brigade to an infantry configuration or, alternatively, to deploy an infantry brigade. MACV subsequently accepted substitution of a mechanized brigade for the infantry brigade, intending to deploy the mechanized brigade to II or III CTZ, which would release an infantry brigade for redeployment to I CTZ.[27]

(TS) Permissive authority was granted by SECDEF in a memorandum dated 13 June 1967 in which he stated that ". . . the approvals given in [6 March SECDEF Memo to JCS] are now expanded to include authorization to employ the resources identified with the PRACTICE NINE SPOS in the execution of the MACV Requirements Plan."[28]

(S) COMUSMACV recognizing that no definite plans had been made regarding anti-infiltration measures to be taken in the flood plain area to the east of Gio Linh (from YD 224747 to YD 253752), requested CG III MAF on 16 June to make recommendations on how to fill the gap. A problem in this sector of the trace was created because the normal river width through the area in question was 50 to 65 meters, except during the NE Monsoons when the width increased to about 1,400 meters. CG III MAF considered it possible to build a clear causeway from the edge of the flood plain to the sea by moving 2.5 million cubic meters of earth; however, the

magnitude of such an effort was beyond his capability in a reasonable time frame. He therefore recommended installation of the SPOS to each flank of the flood plain, interdicting forward of the trace with COMMANDO LAVA and observed artillery fire using VT fuses as necessary. It was pointed out as an aside that ground access from the eastern-most strong point to base area during flood season would be a problem.[29]

(TS) During SECDEF's visit to HQ MACV in July, he was briefed on the status of the SPOS including the following. The strong points of Gio Linh and Con Thien were cleared to a 500-meter radius and were being installed and manned by tactical troops then in the area. The 600-meter wide trace between the two strong points as well as eastward to the flood plain had been cleared of vegetation. At the time it was felt that the first 13 km, from Con Thien to the flood plain, including strong points and base areas, could probably be installed and operational with released PRACTICE NINE materials by 1 November. Since it was recognized that the monsoons would reduce traffic to practically zero after mid-September, a major effort was being made to improve the situation by employing the engineer forces to upgrade Routes 1, 9, and 561, build the necessary pioneer roads to connect strong points with base areas, and prepare storage sites for materials at Dong Ha. Plans to develop the system included as first priority, the conduct of offensive operations to install covering forces for security in observation posts, strong points, and bases areas so that by mid-August the infantry units assigned could complete the construction of the strong points, base areas, and OPs to the point where obstacle installation could begin by mid-September. Plans called for a series of OPs and towers to provide interface with the strong points along the trace. The OPs would house the readout for the sensor/detector information, and the towers would provide platforms for observers and for radar. The BOM that had been developed for construction would be adequate for the 13 km obstacle line, and indications were that the delivery schedule was reasonable to support the 1 November date. Looking ahead, an additional 10 km would be required to complete the trace from the China Sea westward to the nearest strong point. The BOM for this section was under study, and a delivery schedule was being prepared to permit completion of the added segment by June 1968.

(S) By mid-August the enemy situation had begun to change drastically in the general vicinity of the DMZ. CG III MAF noted that although his forces had increased, none of the forces regarded as minimum essential augmentation by the 26 January 1967 Plan had been provided. The enemy threat in the DMZ had progressively increased to the point that friendly forces were fully occupied in holding back the enemy in the Con Thien-Gio Linh area. Friendly forces (four battalions plus combat support and combat service support) with the assistance of extensive and continuous artillery, air (including ARC LIGHT), and naval gunfire support could not accomplish this up forward, while at the same time constructing, manning, and operating the SPOS to their rear. Once completed, however, it was considered that the SPOS would permit the release of some troops for defense to the west and missions elsewhere, CG III MAF accordingly requested that additional forces from outside the I CTZ area be deployed to northern Quang Tri Province or that a brigade of TF OREGON be shifted northward to relieve elements of the 5th Marines. COMUSMACV concurred in CG III MAF's request and sent an additional brigade. As a result, CG III MAF informed COMUSMACV that he planned to use nine Marine battalions--seven to search, clear, and screen in support of the construction effort and the remaining two battalions plus an engineer battalion to construct and man the obstacle as work was completed. In order to expedite the construction, which would take about six weeks, the flow of equipment and materials had to be timely, and construction would proceed as soon as minimum assets were available.[30]

(S) Because of this drastic change in the tactical situation in northern I CTZ, specifically, the increased enemy artillery capability, it became essential that all personnel, command and control elements, and essential ammunition supplies be afforded bunker protection. A reevaluation of requirements indicated need for an additional 150 bunkers, plus additional materials for flooring all bunkers, and additional overhead cover. Screening of in-country assets by MACDC revealed that the added BOM requirements could be met subject to reimbursement by DCPG, and as a result COMUSMACV directed on 15 September that the materials be issued. By 30 September, the necessary materials had been transferred or were

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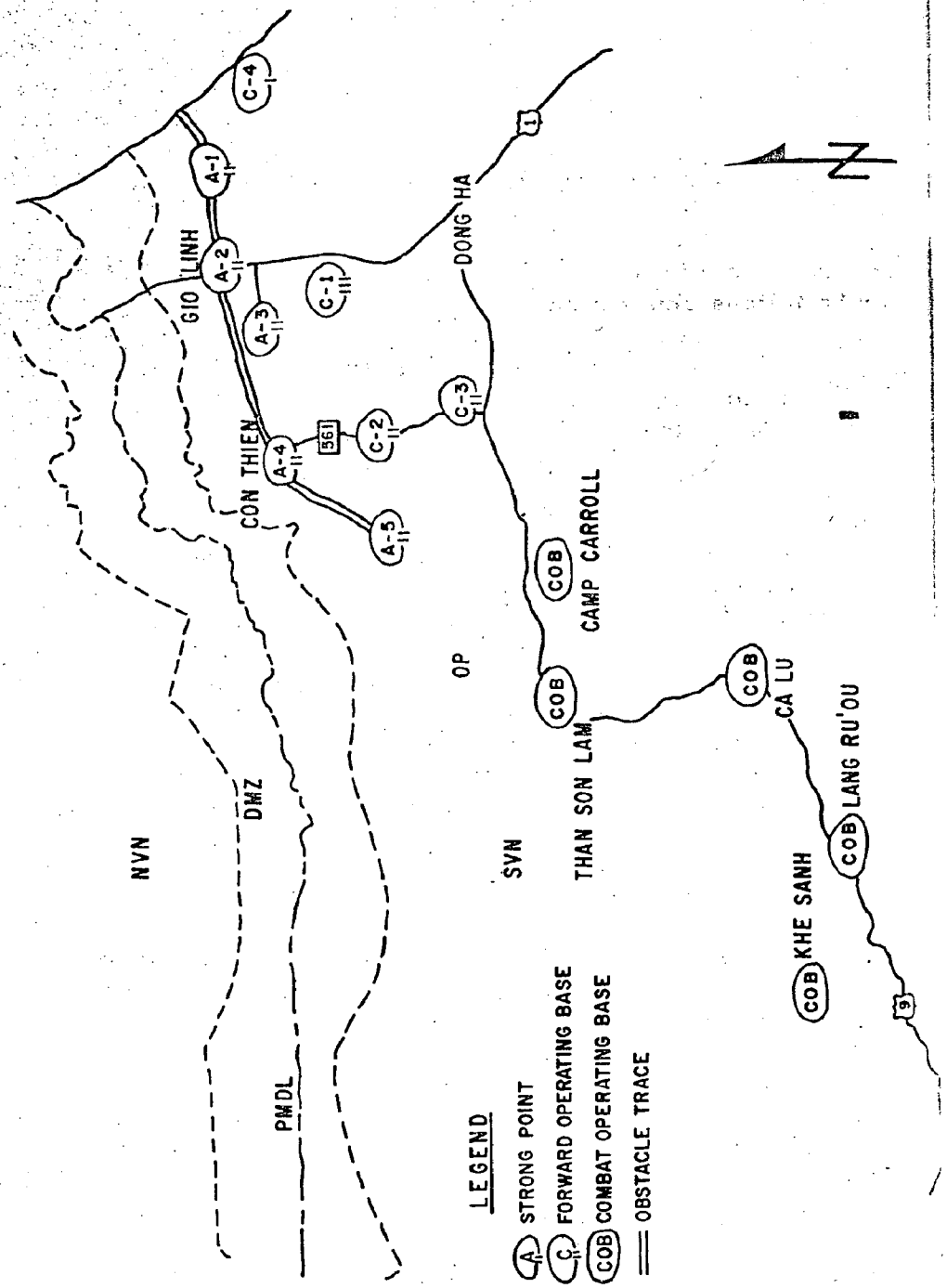

Figure A-1

enroute to the project depot at Da Nang, and III MAF requirements were met in adequate time to allow construction to continue uninterrupted.

DYE MARKER Reorganized

(S) On 7 September COMUSMACV directed CG III MAF to prepare an alternate plan for development of the SPOS, taking into account the increased enemy artillery capabilities and their effect on the construction and security forces. III MAF OPLAN 12-67 was prepared and subsequently approved in concept by COMUSMACV on 13 September. The major change resulting from this plan was to stop construction of the obstacle until the strong points and base areas were completed and the tactical situation had settled down. Minor changes included: (1) relocation of one base area toward Cam Lo in order to provide more security for artillery and other support forces at Cam Lo and to protect a vital bridge on Route 561; (2) addition of a company base area behind the easternmost strong point to provide support, especially during the monsoon when this area is isolated by the flood plain to the west; and (3) occupation by ARVN Bns of four strong points instead of only two as previously planned. The latter would free one Marine Bn to provide necessary security for a new airfield at Quang Tri. COMUSMACV informed CINCPAC that he felt that these adjustments were compatible with the overall DYE MARKER objectives and consistent with SECDEF's public statement on DYE MARKER. He hastened to point out that preliminary estimates indicated that casualties which might be sustained under this adjusted plan should be substantially less than those sustained under the original plan. Considering this adjusted plan, seven US and four ARVN battalions would operate in the area. One US battalion would split between Dong Ha and the adjacent base area, one split between the next two base areas, one at Quang Tri, and the remaining four at Camp Carroll, Than Son Lam, Ca Lu, and Khe Sanh, providing strong secure bases in the area. These dispositions would enable III MAF to detect and attack enemy infiltration in force and also to patrol for covert infiltration. Should the enemy counter by increasing infiltration to the west, plans had already been prepared to move additional battalions to Lang Ruou, Khe Sanh, and Lang Vei.[31] (See Figure A-1).

(TS) COMUSMACV related the status of construction at the time of issue of the new plan to CINCPAC during the latter's visit on 14 September. It was noted that the upgrading of Routes 1, 9, and 561 was progressing satisfactorily in spite of enemy action and heavy rains. Time was lost when base course material on Route 561 failed after a heavy rain that continued for 30 hours, requiring rework throughout. Some delays were recorded due to non-arrival of other necessary construction materials, but the problem appeared to be one of transportation capacity rather than supply. Obstacle materials, although in some cases slightly behind schedule, were all due in by mid-September. Generally, components for the base areas and strong points such as sensors, pickets, and Class V items were behind schedule, although coordination with DCPG LNO reported all items as enroute.

(S) Because of the significant change in the DYE MARKER concept attendant to implementing III MAF's OPLAN 12-67, and the transfer of materials previously reserved for the linear obstacle to other commitments, COMUSMACV requested CG III MAF review his supplementary materials requirements, the dates materials would be required, and the BOM for the ten km obstacle extension. Further, he asked for a planning schedule for installation of the various segments of the obstacle. With the 1 November readiness date but two weeks away COMUSMACV then informed CINCPAC that it was now clear that construction would not be completed by the target date. Weather still precluded ground access to A-3 and A-4, and other priorities prevented work on C-3 and Ca Lu. He pointed out that unless additional resources were applied, construction would not be completed in 1967 even though no delay in construction due to shortages of materials was anticipated.[32]

(S) As a result of his own observations as well as inspections by members of the MACV staff, COMUSMACV concluded that quality control over the installation of the DYE MARKER system was inadequate. It was his opinion that the project had not been accorded a priority consistent with its operational importance and therefore required greater command emphasis and management. Whereupon he directed CG III MAF to take immediate steps to correct deficiencies in construction; to institute a positive system of quality control over construction and installation of the entire system;

and after review of the situation and current progress, to submit rationale for specific slippages and a revised attainable completion schedule. In response, CG III MAF assigned his deputy to head up a permanent DYE MARKER special staff element with representation from NSA Da Nang and his Force Logistics Command (FORLOGCMD). It was made clear to all commanders concerned that the DYE MARKER project had high national interest and a priority second only to emergency combat requirements. In addition, plans were made to deploy a Marine regiment north to provide additional support for tactical requirements. At that time, all A and C sites in the OPLAN 12-67, except A-3, A-5 and A-6, were actually manned and engaged in anti-infiltration operations. CG III MAF assured COMUSMACV that the task of completing construction and improving combat patrol bases would be pursued as a matter of utmost urgency.[33]

Closing the Gap

(TS) With the installation of DYE MARKER and MUSCLE SHOALS approaching realization, COMUSMACV turned his attention to the western Quang Tri Province, where he had envisioned, in the PRACTICE NINE Plan, interdicting infiltration in the defiles of the rugged mountain area. More specifically, as he had explained to SECDEF in July, he was contemplating a series of defile obstacles placed in likely infiltration corridors, supported by mobile forces operating from a series of strong points spread from A-5 to the Laotian border.

(S) In October, COMUSMACV requested CG III MAF to provide a concept for closing the defiles of this mountain area and, in addition, plan to provide interface between the DYE MARKER and MUSCLE SHOALS systems. In reply, CG III MAF spelled out the mission as "conducting anti-infiltration operations in the defile area of northern Quang Tri Province, utilizing battalion combat operating bases, (COBs) located along Route 9 to protect lines of communications, detect, interdict, and destroy/impede enemy infiltration in zone." It was generally assumed in preparing the plan that the installation of DYE MARKER to the east would cause the enemy to increase his use of infiltration routes farther to the west. It was recognized that construction efforts would be impeded during the monsoon season. It was assumed that materials required for construction of the COBs would be available as needed and that sufficient

transportation (land, sea, air) would exist to support COBs west of Camp Carroll.[34]

(S) Operations in the defile area would be conducted from ba talion-sized COBs located at Camp Carroll, Than Son Lam, Ca L Lang Ruou, and Khe Sanh. (See Figure A2). The operations would consist of patrols along Route 9 and as far to the north as permitted by terrain, fire support, and size of the force employed. Rec naissance would be conducted to the limit of supporting artillery-- generally to the line formed by Dong Ta Bang, Lang Cat Su, Lang Dong and Bao Thuong. Aviation assets assigned to MUSCLE SHOALS were considered available on a limited basis for sensor emplacement and tactical support. Intelligence would be exchang over dedicated secure voice and secure teletype circuits between the MUSCLE SHOALS Infiltration Surveillance Center (ISC) at Nakhon Phanom and III MAF forces. Sensor devices, yet to be determined, would be deployed to an optimum distance to the west and northwest, and on known infiltration routes within the capabilities of the readout system. Sensors would be emplaced by fixed wing aircraft, helicopter, and hand emplacement by grou forces with readout from COBs and observation posts. As impro sensor devices became available, the depth of sensor installation the west and northwest would be increased along the valleys and newly-determined infiltration routes. Conceivably, and as the sensors were improved, the MUSCLE SHOALS system might be extended generally eastward and to the north of the defile area of operations to physically link with or overlap the DYE MARKER System.

(S) On 8 December a DYE MARKER Development and Operati Plan was published as MACV Planning Dir 10-67. This plan estab lished responsibilities and schedules for the DYE MARKER Progr Noteworthy in this directive was the definition of DYE MARKER as encompassing the original SPOS of five strong points, a 23 km obstacle, and four support bases. It defined the DFS as a series of battalion base camps, observation posts, and sensors running west from the SPOS to the Laotian border. Specifically, III MAF was directed to plan and test the DFS and to put it into operation as soon as possible with forces in the area together with additiona forces which would be made available as I Corps progressively too over the SPOS.[35] (See Figures A1 and A2).

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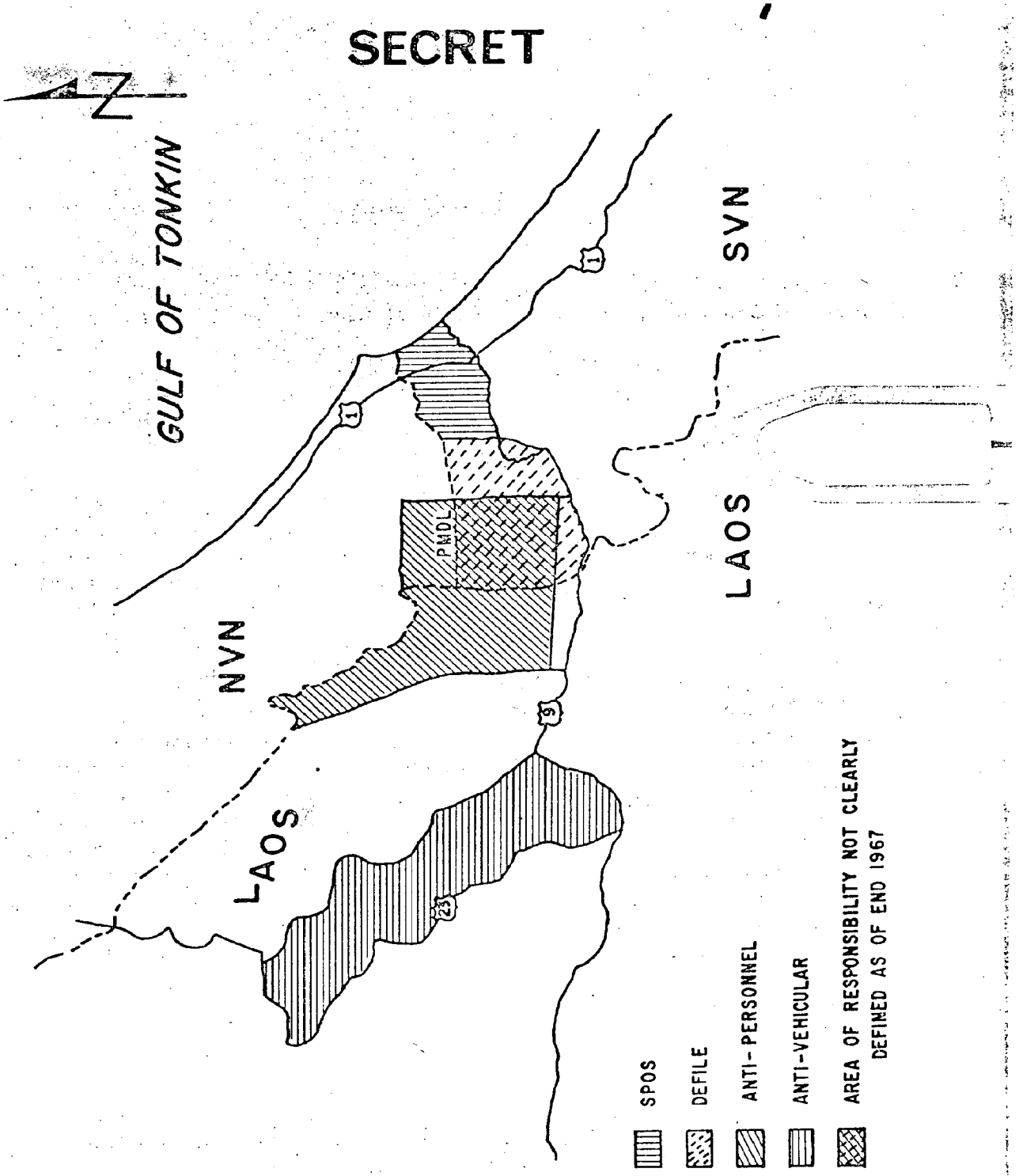

Figure A-2

(S) By the end of the year considerable progress had been made in establishing the counterbattery/fire support coordination effort for the DMZ. A target acquisition battery attached to the 108th Arty Gp had moved into Dong Ha, and was capable of supplying target location data to the counterbattery information center in the 12th Marines FD. Their equipment, including radar, sound, and flash ranging was deployed to Con Thien, Gio Linh, and the Dong Ha combat base.[36]

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Air Supported Anti-Infiltration System

(TS) Support for Communist aggression against GVN is provided principally by the overland flow of men and supplies from NVN across the DMZ and southward through Laos. Interdiction operations against determined infiltration had been successful to varying degrees against vehicular traffic; however, clever use of jungle concealment, the use of a multitude of jungle paths, and the lack of sizable numbers of anti-Communist ground forces contributed to continuous high rate of infiltration by foot. The MACV PRACTICE NINE Air Supported Anti-Infiltration Plan, published 11 March 1967, was designed to suppress this flow of men and materials through the difficult and remote terrain. The plan envisioned an air surveillance and support system which would supplement and act in consonance with the overall interdiction program developed by 7AF. The system was to use aircraft equipped with special navigational equipment to distribute sensors and mines throughout the interdiction areas. These deterrents were to suppress personnel and vehicle infiltration either by incapacitating the infiltrators or by alerting the surveillance aircraft to the infiltration. Information received by the monitoring aircraft would be relayed to an Infiltration Surveillance Center (ISC) for evaluation and possible counteraction.

Concept of Operations

(TS) COMUSMACV directed that data be developed and continuously updated on personnel infiltration trails, vehicle LOCs, and patterns of enemy movement in LAOS and in the DMZ area. These data were to be gathered to use as the basis for selection of targets

1968

TOP SECRET

ANNEX B -- ANTI-INFILTRATION BARRIER

General

(S) On 15 September 1966, the SECDEF directed the development and deployment, on an expedited basis, of an anti-infiltration system to impede the flow of vehicles and personnel overland from NVN into SVN. This system was to include three principal subsystems: a Strong Point Obstacle Subsystem (SPOS) in northeastern RVN, an air-supported anti-personnel subsystem in northwestern RVN and eastern Laos, and an air-supported anti-vehicular subsystem in Central Laos. Overall responsibility for developing, readying, and deploying approved systems was vested in Joint Task Force 728. Optimal employment in SEASIA of the special resources provided fell within the operational responsibility of CINCPAC/COMUSMACV, as exercised through their 7AF and III MAF components. The code word DYE MARKER/DUEL BLADE referred to the special resources provided for the SPOS, and MUSCLE SHOALS/IGLOO WHITE those for the air-supported subsystems. Within the MUSCLE SHOALS/IGLOO WHITE operational area, the (predominantly) anti-vehicular subsystem was referred to as MUD RIVER and the (predominantly) anti-personnel subsystem as DUMP TRUCK. The Infiltration Surveillance Center (ISC) was the ground center where sensor activations were analyzed and interpreted. It was located in the DUTCH MILL facility at Nakhon Phanom, Thailand. The DUCK BLIND project initiated in April 1968 utilized MUSCLE SHOALS/IGLOO WHITE and DYE MARKER/DUEL BLADE assets and technology in a wide range of applications in operations against the enemy in SVN.

Code Name Changes

(TS) The code names given to the system changed several times because of partial compromise of their classified meanings. The first change occurred on 14 June 1967 when the first official name of the program, PRACTICE NINE, was changed to ILLINOIS CITY. A month later ILLINOIS CITY was changed to DYE MARKER. On 8 September 1967, after SECDEF released information to the public which implied the construction of a SPOS south of the DMZ, Defense Communications Planning Group (DCPG) decided to give separate code names to each of the two major subsystems: DYE MARKER remained the name for only the SPOS, and MUSCLE SHOALS became the name of the air-supported subsystems. On 1 June 1968, MUSCLE SHOALS was further changed to IGLOO WHITE. In April 1968, the code name DUCK BLIND was assigned to activate MUSCLE SHOALS/DYE MARKER resources, other than to impede overland infiltration from NVN to SVN, in operations against enemy forces in SEASIA. The unclassified meaning of DUCK BLIND was a program associated with the DCPG. The code name DYE MARKER was changed to DUEL BLADE in June 1968. On 15 October, the nickname DUCK BLIND was dropped because of compromises and the nickname DUFFEL BAG was substituted. [1]

Summary of Operational Results

(S) Operationally significant MUSCLE SHOALS capabilities were realized by mid-December 1967 in the anti-vehiclular subsystem and, by late January 1968, in the Khe Sanh Combat Base defense role. However, tactical developments in the eastern DMZ area forced postponement of the completion of the SPOS.

TOP SECRET

DYE MARKER/DUEL BLADE

General

(C) The purpose of the DYE MARKER anti-infiltration system was to reduce the infiltration of NVA forces and material into SVN. The type of obstacle used to deny infiltration was dictated by the terrain and political considerations.

(C) Near the DMZ in SVN, the terrain from the South China Sea to 23 km inland is flat and lends itself to a straight line type obstacle. Further inland, rolling hills gradually become mountainous as they approach the Laotian border. In this area, a series of strong points and defile barriers in the choke points and routes of infiltration were required.

(C) The SPOS was to consist of an obstacle trace from the South China Sea to the Dong Ha Mountain, backed up by a series of strong points. The obstacle trace was to be fronted by a fence at the northernmost edge of the trace. This would be backed up with twin single apron and barbed steel tape, an anti-personnel mine field, a passive sensor detector system, and twin single apron with barbed steel tape to mask the rear edge of the obstacle trace. Associated with the obstacle trace would be a series of observation posts (OP) and towers. Six heavily fortified strong points would be installed to support the obstacle system with battalion base areas as back up. The manning force was scheduled to be a USMC regiment and an ARVN regiment (See Figure B-1).

Fighting Bunkers

(C) The Third Naval Construction Brigade (NCB) was given the job to design and construct two prefabricated concrete fighting bunkers for demonstration and display in Da Nang. One bunker was constructed of concrete logs and the other consisted of a concrete parapet slanted inward at 60 degrees. These bunkers were also tested to determine the protection offered against .30 and .50 cal machine gun fire and 155mm shells. It was determined that chain link fence provided good protection against RPG fire and the decision was made to incorporate this protection into the fighting bunker design. On 14 January, a demonstration conducted for COMUSMACV resulted in a decision to construct three additional slightly modified concrete fighting bunkers for evaluation. At another demonstration, in late January, COMUSMACV, Chief JGS, and CG, III MAF decided the slant sided parapet would be utilized in places permitting machine lift to position and the concrete log parapet would be used in places requiring hand lift. The mobilization of material and personnel to prefabricate the bunkers was initiated by the Third NCB at Dong Ha. By 19 March, the construction of 32 Lincoln Log bunkers had been completed with production of the slant sided bunkers scheduled to begin on 1 April 1968. By the end of June, 80 Lincoln Log bunkers had been fabricated along with 400 slant sided type. These bunkers were scheduled for installation during the month of July.[2]

Living Bunkers

(S) As a result of evaluations conducted at Fort Benning, Ga., two of the five living bunkers tested were selected as most desirable for use in RVN. These two bunkers were the prefabricated concrete arch and the multiplate culvert. Arrangements were made to have forms for the

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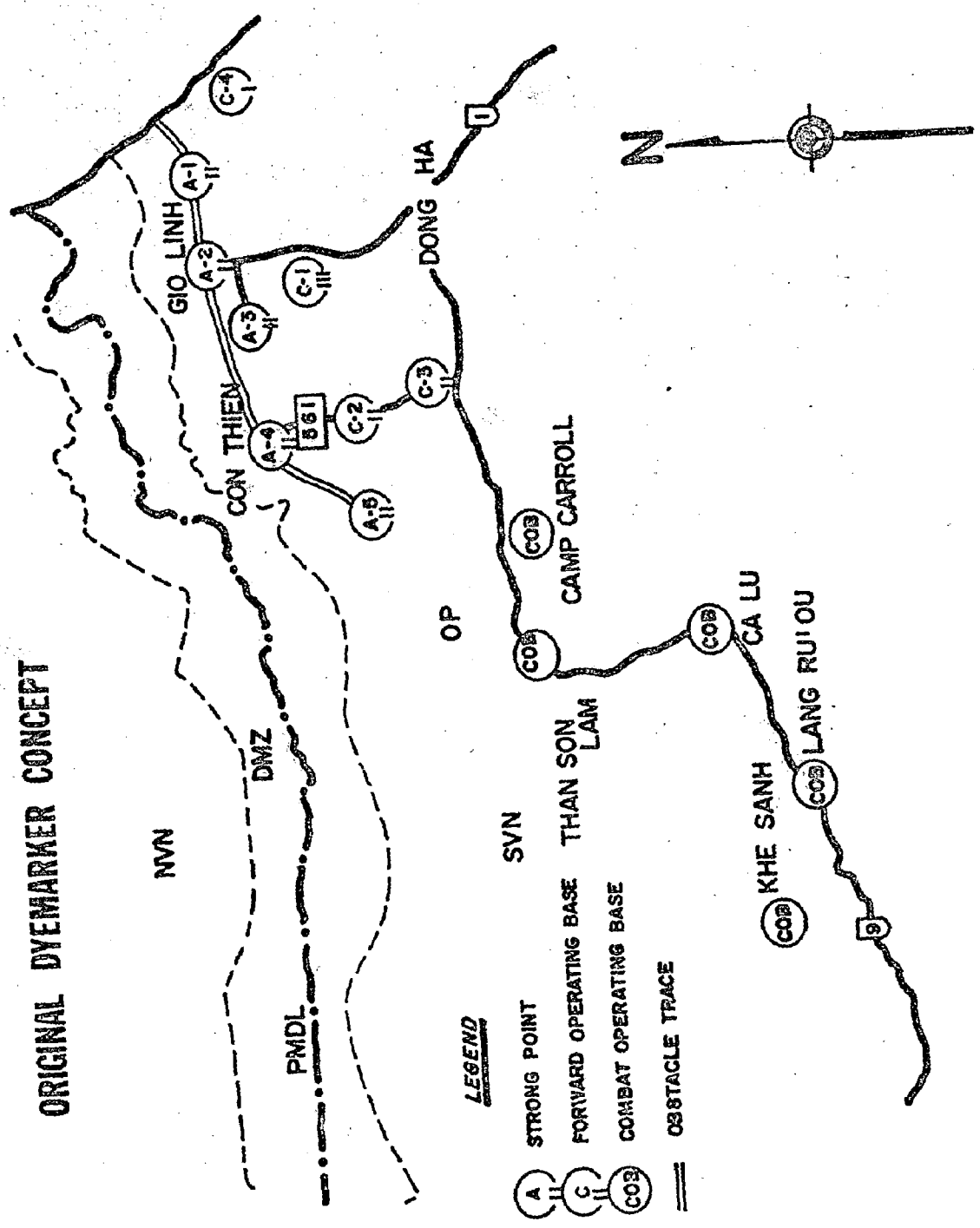

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FIGURE B-1

concrete arch and two multiplate bunkers with end sections shipped to Da Nang for erection and further evaluation. A demonstration was set up on Red Beach by Third NCB in March for approval by COMUSMACV. The multiplate culvert was unanimously picked for use at DYE MARKER sites. [3]

(S) At MACV request, DCPG had directed procurement of an Armco Multiplate Metal Arch and underpass for the first 300 living bunkers. Third NCB was directed to procure other items for the first 300 living bunkers. In order to provide timely advance procurement, DCPG was requested to procure and store components for an additional 546 bunkers at Port Hueneme. The estimated total living bunker requirement was 846.

(S) Based on a MACV request for assistance, DA investigated the feasibility of using eight-gauge corrugated metal interior partitions as exterior endwalls. The Office of the Chief of Engineers, USA indicated this course of action was not recommended due to probable failure resulting from static earth pressure and very high stresses produced by differential settlement of the entryway and shelter itself. However, in light of continuing requirements for improved endwall design, the Army and Navy were tasked separately to propose and test other methods. [4]

ARVN DYE MARKER Regiment

(S) On 28 January 1968, COMUSMACV discussed the importance of having ARVN man strong points and the resultant need to give ARVN the necessary resources, such as fighting bunker construction and crew-served weapons, for the strong points. He further expressed his opinion of the importance of the need for a fast mobile reserve in the vicinity of C-1 (a forward operating base), the desirability of ultimate ARVN occupancy of C-4, and the need for ARVN DYE MARKER buildup.

(TS) COMUSMACV provided the following guidance:

1. Build toward an ARVN DYE MARKER Regiment of five four-company battalions and one armored cavalry squadron. One battalion will be located at each base and disposed to man OPs along obstacle trace (using not more than 12 platoons in entire ARVN portion of trace) to provide two-company perimeter defense at A-1 (and one company reserve that will ultimately occupy C-4), and to provide three-company perimeter defense of A-2, A-3, A-4 and C-1. The armored cavalry squadron and one infantry company or more will be in mobile reserve at C-1.

2. Organize DYE MARKER regiment by: attaching four new 1st ARVN Div companies now training to the four DYE MARKER battalions, one per battalion; organizing next 5 new companies into fifth DYE MARKER battalion; and forming and training new DYE MARKER cavalry squadrons as soon as necessary equipment and personnel can be drawn together. Augment ARVN forces with additional crew-served weapons. [5]

(S) COMUSMACV informed CG, III MAF on 30 January that he had made the decision to augment the ARVN DYE MARKER Regiment with additional forces and weapons so that it would be properly organized for its mission. At this time, MACJ33 was designated project manager at MACV level and it was recommended that a similar project manager be established at III level. [6]

(S) The concept called for a certain percentage of the SPOS to be manned by ARVN forces. COMUSMACV requested approval from CINCPAC on 29 January to augment the ARVN units manning the strong points with the following additional weapons:[7]

Machine gun, 7.62mm light M60	-	98
Mortar, 81mm M29/M23A1 Mount	-	22
Mortar, 60mm M19 W/E	-	22
Recoilless Rifle, 106mm on Mount M79	-	15

(S) In compliance with COMUSMACV's guidance, CG, III MAF established the following goals for accomplishment by 30 June 1968:

1. Constitute the present 2d ARVN Regt, 1st Inf Div as the DYE MARKER Regiment to be composed of five infantry battalions (four rifle companies each and one headquarters company each) and one armored cavalry squadron.

2. Employ the regiment to man strong points A-1 through A-4, to include a minimum of twelve platoon-sized observation posts along the linear obstacle between A-4 and the South China Sea coast; forward operating base (FOB) C-4 with one rifle company; FOB C-1 with the armored cavalry squadron and up to one infantry battalion.

3. Direct support artillery and other supporting arms as required and to be determined.[8]

Revised DUEL BLADE Program

(S) Per request of COMUSMACV, CG, III MAF submitted a revised DUEL BLADE Plan on 15 June. In essence the plan proposed that:

1. The ARVN DUEL BLADE Regiment would continue to occupy DUEL BLADE positions A-1, A-2 and C-1. Additionally, ARVN would relieve US forces and occupy position A-3 by October 1968 and position A-4 by December 1968.

2. US forces would continue to occupy positions A-3, A-4, C-2, C-3, and C-4. Following relief by ARVN forces in December, C-2, C-3, and C-4 and the Defile System would continue to be occupied by US troops.

3. The US Mobile Reserve initially stationed at C-1 would be replaced by the ARVN armored cavalry regt on or about 1 September 1968.

4. The requirement for site A-5 would be eliminated.

5. The installation of the linear obstacle would be deferred indefinitely.

6. Relocation of C-3 would be eliminated.

7. The requirement for COB at Lang Ro Du and Khe Sanh Combat Base (KSCB) would be eliminated.

8. Concrete fighting bunkers would be installed as programmed.

9. All "A" positions would be constructed on the basis of an ARVN battalion with fighting bunkers for three companies.

10. Maximum effort would be expected to accelerate the construction activities prior to the onset of the northeast monsoon.[9]

(S) COMUSMACV approved the following aspects of the concept on 5 July:

1. Deferral indefinitely of installation of the linear obstacle.

2. Construction of "A" positions on a basis of one ARVN battalion each.

3. Acceleration of construction to accomplish as much as possible before the onset of the northeast monsoon.

4. Installation of IGLOO WHITE sensors between "A" sites with replacement dependent upon effectiveness.

(S) Regarding the stationing of ARVN troops, COMUSMACV requested CG, III MAF to discuss the matter with CG, I CTZ with the objective of setting a target date for ARVN occupation of A-3 as the next step toward ultimate ARVN occupation of all four strong points.

(S) CG, III MAF was also tasked to prepare plans for the construction of the linear obstacle and strong point A-5. The planned construction was to be in three phases with the decision for the actual construction to be made at a later date.[10]

(S) Discussion between CG, III MAF and CG, I CTZ revealed that the CG, I CTZ did not desire to commit ARVN forces to sites A-3 and A-4 for the foreseeable future. Instead, he wanted to occupy A-1, A-2, and C-1 and to employ his two remaining infantry battalions in a mobile role with Marine forces in the DMZ area. CG, III MAF recommended concurrence with the ARVN commander and he informed COMUSMACV that III MAF was proceeding under the general premise that we should "walk away from the earlier DYE MARKER concept." A mobile posture was planned under the current precept in lieu of a physical obstacle.[11]

(S) The proposal that ARVN forces focus on developing a capability for mobile operations in the DMZ, instead of occupying A-3 and A-4, met the approval of COMUSMACV. He stated, however, that at a later date ARVN should be eased into occupying both sites after receiving sufficient training.

(S) COMUSMACV made the following comment in reference to mobile operations:

> Change to primarily mobile operations in DMZ area and indefinite deferral of DUEL BLADE obstacle appear to be about as far as we should walk away from earlier DYE MARKER concept. We must

be prepared to construct the obstacle when an opportune occasion occurs. In this event A-5 should be installed as the logical western anchor for the obstacle system stretching across the coastal plain. Accordingly, A-5 should be included in obstacle construction plans. [12]

(S) CG, I Corps and CG, III MAF met on 9 July to discuss DUEL BLADE planning with respect to bunker construction, availability of construction materials, and control procedures at I Corps/III MAF level and in subordinate commands. Agreement was reached between the two commanders on the division of responsibilities between US and ARVN, concepts for employment of forces, and future DUEL BLADE plans. [13]

(S) On 22 October, COMUSMACV ordered all construction and planning efforts associated with the present DUEL BLADE Program to be halted pending further guidance. [14]

(S) On 29 October, MACV Planning Dir 10-67, which established the responsibilities and schedule for planning and implementing DUEL BLADE/DYE MARKER Program, was rescinded. A revised anti-infiltration program, still referred to as DUEL BLADE, was initiated because of the change in the operational posture of friendly and enemy forces. The old DUEL BLADE concept, anchored to the SPOS, was no longer considered suitable for current or anticipated tactical operations in support of the anti-infiltration mission of FWMAF in northern Quang Tri Province.

Concept for Revised DUEL BLADE

(S) Under the new concept, FWM maneuver forces, maintaining a mobile, operational posture supported by air strikes, artillery, and naval gunfire, would actively resist infiltration from the north across the Provisional Military Demarcation Line (PMDL). In locating hostile forces, whether infiltrating or static, all means of surveillance and intelligence would be used. These included, but were not limited to, motion detection radar, night observation devices, person searchlights, attended and unattended detection devices (sensors), FACs, patrols, and [illegible] and agent reports. Of these means, sensors were expected to provide a constant 24 hour-a-day capability.

1. For maximum utilization, sensor emplacement was to begin immediately south of the PMDL (the PMDL being the northern limit of the revised DUEL BLADE area). Route 9 from Laos in the west, east to Ca Lu, thence on a line direct to Dong Ha, and on to the South China Sea via the Cua Viet River was to be the southern limit of DUEL BLADE.

2. Present "A" and "C" sites were to be used as fire support bases as required. Other DUEL BLADE assets not yet expended were to be used in support of this revised program at the discretion and direction of CG, III MAF.

3. Sensors were to be ground read-out by maneuver elements when location permitted; air read-out by III MAF air resources was to be provided for areas temporarily without ground read-out capability. Sensor frequency and tone-code limitations permitting, read-out would be accomplished via 7AF resources.

4. A centrally located facility was to be provided the tactical area commander for processing information from all intelligence sources. This intelligence information, together

with friendly order of battle, was to be automatically collated and visually displayed in as near real-time as possible. A storage capability was to be provided for a historical base to be used for analysis and reporting.

5. Some of the sensors planned for use in this concept had been subject to NOFORN restrictions. These restrictions were being modified to permit required RVNAF to utilize the equipment in tactical operations. Strict control and accountability by US forces was to be maintained over read-out devices. Sensor equipment supply, storage, and maintenance was to remain US only.

(S) Responsibilities delegated were as follows:

1. CG, III MAF:

a. Was responsible for operational and administrative planning for and implementation of the revised DUEL BLADE Program. Plans would be submitted to MACV for review NLT 14 November 1968. Planning would include, but not be limited to, the following:

(1) An OPLAN and ADMIN Plan based upon the provided concept.

(2) Intended use of existing facilities within TAO, e.g., Camp Carroll, strong points A-1 through A-4 and support bases C-1 through C-4.

(3) Utilization of on-hand DUEL BLADE materials.

(4) Bills of Material, as required. (Requirements for this program would be determined before consideration was given to the release of DUEL BLADE materials for other projects).

(5) Provisions for interface with out-of-country programs of 7AF.

(6) Air support requirements, to include air read-out of sensors.

(7) Sensor employment plan, to include emplacement priorities.

(8) Personnel requirements, if additional to prior program, with appropriate justifications.

(9) Provision for anti-infiltration surveillance coordination center.

(10) Provision for coordination with CG, I CTZ for combined operations, sensor training, supply, maintenance, and control.

(11) Provision for naval gunfire support in accordance with current procedures.

b. Would provide to MACV the functional requirements for a Mobile Infiltration Surveillance Center (MISC). It was intended to request DCPG for the development, procurement, and delivery of this mobile facility on an expedited basis.

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2. CDR, 7AF would coordinate with CG, III MAF on interface between IGLOO WHITE and DUEL BLADE at the Laotian border to assure coordination of intelligence efforts and minimum interference between forces. CDR, 7AF supports with air in accordance with current procedures.

3. COMNAVFORV would continue logistical support.

4. CG, USARV would continue logistical support.[15]

(S) Sensor inventory remained low through October although production forecasts indicated relief by mid-December. COMUSMACV informed his major commanders on 31 October that recent decisions influencing infiltration interdiction programs, changes in the pattern of operations and the significant sensors required a shift in priorities. Consequently, the maintenance of an active field of 160-200 sensors was allocated to the revised DUEL BLADE Program. Sensors in excess of revised DUEL BLADE requirements were to be used in base defense with priority given to bases most frequently subjected to enemy probing.[16]

(S) CG, III MAF requested authority on 30 October to close out DUEL BLADE positions A-3 and C-3 as soon as possible. Occupancy of these positions was not envisioned in III MAF detailed plans and the sudden departure of the 1st Cav Div necessitated redisposition of forces in the XXIV Corps area. Concurrence by COMUSMACV was forthcoming on 3 November.[17]

(S) During the month of December, three sensor fields were hand implanted in the eastern portion of the DUEL BLADE area. Coordination between III MAF and 7AF was initiated to begin air implantation of sensors in the western area. By the end of the year, defoliation of a trace 1,500 meters wide adjacent to the border of Laos and immediately south of the DMZ in the western area of DUEL BLADE was 65 percent completed.

(S) III MAF OPLAN 405-68 (DUEL BLADE II) was approved by COMUSMACV on 30 December. Implementation was directed to be accomplished within programmed funds and available resources.[18]

MUSCLE SHOALS/IGLOO WHITE

General

(S) MUSCLE SHOALS, a $670 million per year air-supported surveillance system was designed to help reduce the infiltration of men and material into SVN. It has two major subsystems: MUD RIVER, the anti-vehicular subsystem covering the major roads in Laos, and DUMP TRUCK, the anti-personnel subsystem in the western part of the DMZ and eastern Laos. Special MUSCLE SHOALS munitions (gravel, dragon tooth, button bomblets, and wide area anti-personnel mines) alone cost approximately $300 million a year. (See Figure B-2).[19]

(S) The code name IGLOO WHITE was substituted for MUSCLE SHOALS on 1 June 1968 but the program remained unchanged.

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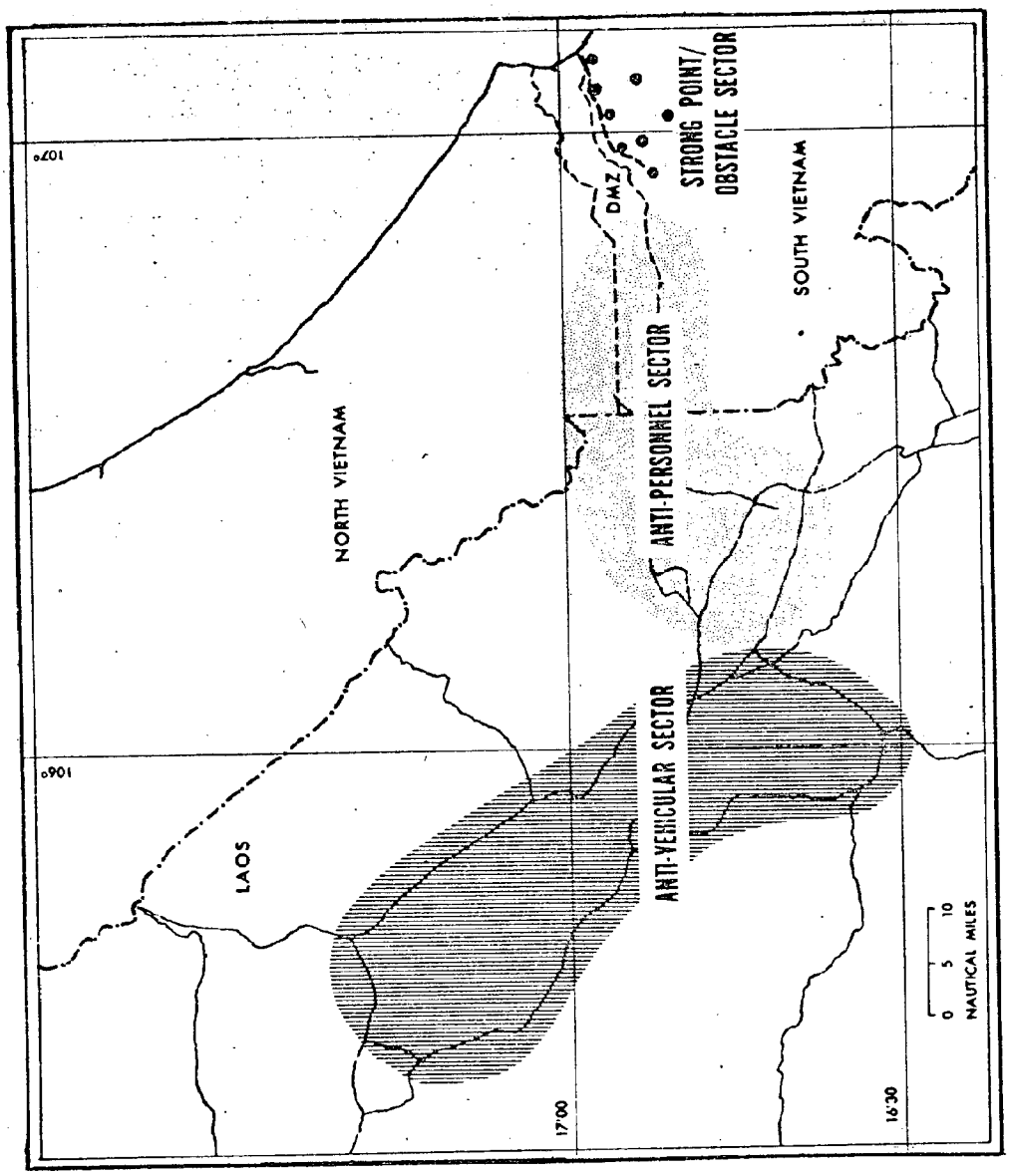

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FIGURE B-2

December Through March -- Introduction, Completion, Validation and Operational Integration

(S) The first weeks of operation in MUD RIVER were extraordinarily hectic. MUSCLE SHOALS was a very complex and new assemblage of equipment, facilities, concepts, people, and procedures. It had been rushed into the field while still definitely in R&D from a system point of view. Also, the interdiction campaign into which it was injected had only recently entered an unprecedentedly dynamic new phase--five to ten times the pace of the previous year. Under these circumstances, the early weeks were inevitably a nightmare of fault detections, analysis, and correction; design oversight discovery; procedure revision; interface clarification; and human error due to inexperience. Concurrent with this R&D consummation under fire, a substantial effort was required to complete construction and installation of the facilities at Nakhon Phanom. A substantial fraction of the staffing was also completed during this period--with the attendant indoctrination, training, and organizational accommodations. Over and above all of these diversions, the extraordinary national interest in the project resulted in a flood of distinguished visitors and innumerable urgent messages questioning, recommending, and requesting data and explanations.

(S) In spite of these complications, the sensor field was successfully deployed over the MUD RIVER area. The sensors did respond to passing trucks (among other things), the EC-121s did pick up the sensor signals and relay them to the ISC, and the computer-assisted ISC analysts did derive usable movement reports. By 7 December 1967, the ISC was fully operational and providing numerous Spotlight Reports to Task Force ALPHA operations for utilization in the Tactical Air Control System. The fundamental premise underlying the system was proven--that it was feasible, in a combat environment, to air-emplace and monitor a large sensor field and relay the sensor outputs in real-time to a remote center for analysis and exploitation.

(S) Once this critical milestone had been passed, validation of the ISC's truck movement reports became the principal focus for TF ALPHA activities in MUD RIVER. In the existing tactical environment, no more direct calibration means were available than diversion of Forward Air Controllers (FACs) to investigate as many individual Spotlight Reports as practicable. The fluctuations of the resulting "confirmation rate" were tracked and analyzed in infinite detail from Washington to Nakhon Phanom. Over a period of weeks, it emerged that this seemingly simple and straightforward index of MUSCLE SHOALS performance was in itself virtually meaningless. It was largely determined by such extraneous factors as FAC time availability, road visibility, weather, enemy ability to evade FACs, defense intensity, level of strike activity, command emphasis on confirmation for sake of confirmation, and truck density in the area. Complex analyses of masses of data have been required to draw any quantitative conclusions at all concerning the reliability of Spotlight Reports as indicators of actual truck movements. The most that has been established with any degree of assurance was that between 50 percent and 80 percent of vehicular Spotlight Reports were generated by actual truck movements (the remainder being spurious). The present high value ascribed to MUSCLE SHOALS as a truck movement intelligence source derived less from this "direct confirmation" measure than from the general plausibility and realism in detail of the pattern of enemy activity derived from correlation of ISC reports over time and space. By the end of February, a high degree of knowledgeability and recognition of the utility of MUSCLE SHOALS' reports had been developed in 7AF elements prosecuting the war on the Laotian LOCs.

(S) The planned DUMP TRUCK operational test of an air-supported anti-personnel infiltration barrier on the trail network in eastern Laos-western DMZ area was overrun by the event of the massive enemy buildup at Khe Sanh. Here, as earlier in the DYE MARKER area to the

east, the tactical problem changed from infiltration to invasion. On 19 January, COMUSMACV directed diversion of DUMP TRUCK resources to the direct support of Khe Sanh. Within a remarkably short time, the meticulously planned initial deployment was completely replanned, relocated, and reoriented to battlefield surveillance of the Khe Sanh area. The first sensors were emplaced on 21 January and more than 150 sensors were operating by 25 January. Arrangements were made to send Spotlight Reports from TF ALPHA to the Marine Fire Support Control Center (FSCC) at Dong Ha and directly to the Intelligence and Targeting Officers at Khe Sanh. Throughout the siege, these reports contributed timely and pertinent tactical intelligence not available from any other source. On a 24-hour, all-weather basis, they provided, from monitored points throughout a wide area, useful information on personnel and vehicular movements, on concentrations and general levels of activity, and on firing sites. The speed and success of this system adaptation to a completely different tactical application from that originally envisioned was a dramatic demonstration of the flexibility and versatility inherent in the MUSCLE SHOALS concept.

(S) During February and March, a significant evolution occurred in the way the sensor reports were utilized at Khe Sanh. In the beginning, well-defined targets for artillery and air strikes were scarce and the Marine Targeting Officers were unfamiliar with the operating characteristics of the sensor field. Individual movement reports were responded to by artillery or air strikes against the sensor location given in the Spotlight Report--in essence, the originally contemplated "Infiltration Barrier" reaction. Although a definite improvement on blind harassing and interdiction targeting, this tactic was inherently limited in effectiveness by the time delay in the reporting system (30 minutes and up from sensor report through DUTCH MILL to Khe Sanh) and by unresolvable uncertainties in sensor location and target separation from sensors. As the siege progressed, potential targets became plentiful and the Marine Intelligence and Targeting staff became familiar with the sensor field, its capabilities, and its limitations. At this stage, firing (or bombing) at every indication of movement would have been a relatively unproductive utilization of the available strike resources. Greater payoff lay in the development of particularly lucrative targets for massed and coordinated artillery and air strikes. The sensor reports came to play a key role in this decisive phase of the action. They were correlated with visual reconnaissance and other intelligence sources to analyze and anticipate the enemy's overall plan of attack, to pinpoint and functionally categorize his concentration areas, and to deduce timing patterns in his supply and assault activities. Against this background, the available artillery, tactical air, and B-52 firepower could be concentrated on selected areas to achieve maximum results. In many cases, the proper timing of attack on a selected target area was essential. As an example, a known assembly area for the reserve regiment in an anticipated enemy assault plan became an extremely profitable target for preplanned massed fire--but only in the brief interval between positioning and jump-off. In instance after instance, in night and fog, sensor-derived activity patterns provided the "now is the time" cue for strikes. This mature exploitation of MUSCLE SHOALS as a complement to other intelligence and targeting techniques, rather than as a stand-alone trigger for reflex response, became a major guidepost for future applications.

(S) Another evolutionary advance during the Khe Sanh siege was the initial use, on a small scale, of ground read-out devices (MICROTALE) for local monitoring of sensor strings within line of sight of an observation post. This technique for intensive monitoring on a real-time basis of a few air-emplaced (or hand-emplaced) sensors was a valuable complement to the wholesale data handling techniques of the basic MUSCLE SHOALS approach. It lent itself well to many anticipated tactical applications.