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Development of Scenario Material to Support Two-Person Play Within SIMTOS

by

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The proposed modifications of the current SIMTOS were to accommodate: (1) joint play wherein an Intelligence Officer (G2) and an Operations Officer (G3) would interact in decision making and problem solving in a simulated tactical operations center environment (SIMTOS-23); and (2) to put a live G3 in a defensive (D) role against a live G3 in an offensive (O) role (SIMTOS-OD). Past experiments had employed a computer as the player's opponent.

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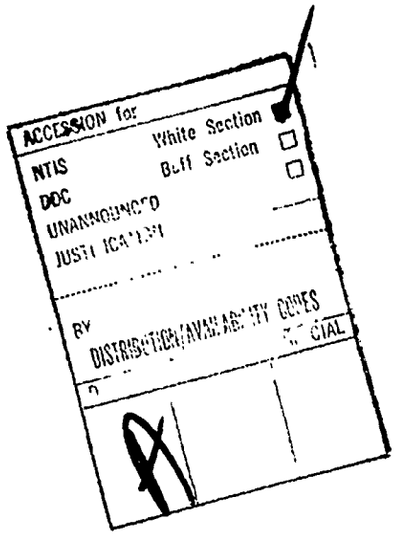
In SIMTOS-23, individual and joint scoring posed unique problems. Within a real world environment where constant, rapid, and demanding interaction is the norm, it is difficult to measure with precision the individual decision processes and use of decision aids. To achieve the basic purposes of a G2/G3 SIMTOS experiment, certain artificialities were introduced but these were minimized.

In OD SIMTOS certain significant problems were readily apparent. One was to overcome the difficulties an Aggressor G3 would encounter when faced with structuring and maneuvering a large foreign military force against a Defender G3 who was trained for and had extensive experience in U.S. force structure and maneuvering. Secondly, the Aggressor G3 had to function as a live, independently thinking and active individual, not as a computer. And lastly, the quantity and quality of intelligence to be provided opposing G3s had to be addressed.

This report is primarily addressed to military researchers engaged in man-in-the-loop simulations which investigate player behavior in cooperative and antagonistic circumstances.



FOREWORD

The Human Factors Technical Area is concerned with the human resource demands of increasingly complex battlefield systems which are used to acquire, transmit, process, disseminate, and utilize information. This increased complexity places greater demands upon the operator interacting with the machine system. Research in this area is focused on human performance problems related to interactions within command and control centers as well as issues of system development. It is concerned with such areas as software development, topographic products, tactical symbology, user-oriented systems, information management, staff operations and procedures, decision support, and sensor systems integration and utilization.

One area of special interest concerns command staff decisionmaking and information processing. With the advent of an automated tactical operations center several years away, experimental investigations of critical man-machine and man-man interfaces at the command staff level require use of command staff simulation. To support research in this area, ARI has developed SIMTOS: a man-in-the-loop interactive simulation of a tactical operations system. It is a computer-based, controlled exercise environment for the experimental analysis of information processing by a single member of the division level command staff (either G2 intelligence, or G3 operations). Previous research did not directly involve G3/G2 interaction or require a live, intelligent opponent. This report analyzes the current SIMTOS and delineates the development and modifications required to provide for interactive G3/G2 play in SIMTOS, as well as for the capability to play a live aggressor G3 against a live defender G3.

Research in the area of command staff decisionmaking is conducted as an in-house effort augmented by contracts with organizations selected for their specialized capabilities and unique facilities. The present research was conducted by personnel from Ketron, Inc. under contract DAHC-19-78-C-0021. Research in this area is responsive to general requirements of Army project 2Q162722A774. This effort is related to special requirements of the U.S. Army Intelligence Center and School, Ft. Huachuca, Ariz., contained in HRN 78-35 (Wargaming of Intelligence) and to Science and Technology Objectives 78-1.1 and 78-9.1.1.

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BRIEF

Requirement:

To develop player tasking and the necessary related materials within the context of SIMTOS to support research on two players in two new versions; one involves a two-person joint-play game (G2 and G3) against a computer-programmed "Aggressor"; the second one involves two opposing G3 players.

Procedure:

SIMTOS-23

A detailed analysis of typical G2 functions and tasks was made and player tasks were selected based on several criteria: significance, degree of impact on G3 activities, potential interaction with the G3, requirement to search the data base, ability to be scored, potential impact on the combat phase.

The G2 and G3 tasks were placed in a play sequence, allowing for individual and joint scoring.

A conceptual approach to scoring was developed, stressing measurement of interactive relationships between the G2 and G3.

A detailed review was made of the existing G2 and G3 bulk data bases for defensive planning and the G3 bulk data base for combat. Recommendations for data base changes were developed to satisfy SIMTOS-23 requirements.

SIMTOS-OD

A detailed analysis was made of the anticipated actions and needs of a typical G3 in a defensive force posture faced with an impending attack planned and executed by an aggressive, vigorous, live G3.

The relative advantages, for the sake of realism, which a live aggressor G3 (AG-3) might bring to the experiments and, conversely, the practicability, considering resources and time available for doing so, were analyzed. Impact on the existing scenarios and bulk data bases was assessed and recommendations made to optimize the existing data bases.

Early on, it became apparent that substantial disparity in qualifications would be evident at the outset of play if one of two essentially equal players was to begin play with a completely unfamiliar Circle Trigon Combined Arms Army.

An effort was made to eliminate the disparity in familiarity with force structure, operational art and tactics, capabilities, etc., and initiate the game with G3s equally qualified for planning and maneuvering of two quite dissimilar forces.

A conceptual approach to intelligence management was developed.

Conclusions:

SIMTOS-23

1. G2/G3 interaction is an essential feature of SIMTOS-23 and measures of interaction must be developed and tested as predictors of tactical outcomes.

2. A recent method of relating decisions to outcome, capable of measuring the individual and joint contributions to outcome, was found to be applicable to the SIMTOS-23 experiment.

3. In order to be scored individually, the G2 must accomplish certain tasks in isolation from the G3 at the cost of some loss in realism. The individual scoring of G2 and G3 should remain based on Leavenworth Standards.

4. The current defensive G2 scenario and data base should be modified to deprive the G2 of conclusions since it is recommended that G2 conduct a free play.

5. Intelligence information provided to the G2 should be "true" rather than ambiguous. No significant gain is seen to be derived by having the G2 test the reliability of information.

6. The G3 should be asked to execute the OPLAN, jointly developed with the G2, rather than proceed to combat with a standard school plan.

7. The tasks now assigned to the G3 in the current SIMTOS are appropriate.

8. SIMTOS G3 defensive scenario requires no significant change. The G2 part of the current defensive G3 scenario and data base should be taken out and the current defensive G2 scenario and data base added to the current defensive G3 scenario.

1. The employment of a U.S. trained, experienced Army officer to fulfill the role of an AG-3 would not be practical unless previously or specifically trained in Circle Trigon organization, doctrine and tactics. Since this is impractical as a prelude to each experiment, it was further concluded that an expert AG-3 can be engaged for the series of experiments.

2. An expert AG-3 repeatedly engaged in the OD-SIMTOS experiments would start play with significant advantages over the opposing DG-3.

3. An AG-3 with unlimited flexibility in selection of courses of action and force organization could inflict an inordinate programming and administrative burden on the experimenters. It is recommended that AG-3 be constrained to one course of action in the planning phase and free play in the combat phase.

4. The use of a live AG-3 may require some modification to the SIMTOS On-Line Facility and addition to the hardware subsystems and changes to the bulk data base.

5. Scoring methodology should remain the same as currently used for the DG-3 in the existing SIMTOS.

TABLE OF CONTENTS

		Page
I.	SIMTOS-23	1
	RESEARCH CONSIDERATIONS	1
	THE G2 FUNCTION	1
	SUMMARY	4
	PLAYER TASKING	6
	SELECTION OF G2 TASKS	6
	STRUCTURING AND TASKS FOR THE G2 PLAY	11
	PLAY SEQUENCE	15
	SCORING	19
	SELECTION OF BEST SUBSET OF REGRESSION VARIABLES	20
	SIMTOS DATA BASE MODIFICATIONS	24
	G2 DATA BASE	24
	G3 DATA BASE	25
	BIBLIOGRAPHY (SIMTOS-23)	27
II.	SIMTOS-OD	28
	RESEARCH CONSIDERATIONS	28
	ASSUMPTIONS	28
	DISCUSSION	28
	ANALYSIS OF OD-SIMTOS PLAY	32
	SIMULATION OF THE INTELLIGENCE FUNCTION	32
	AG-3 PLAY OPTIONS	33
	SIMTOS MODIFICATIONS	35
	GENERAL	35
	DATA BASE	36

SCORING 38

BIBLIOGRAPHY (SIMTOS-OD) 39

LIST OF TABLES

		Page
1.	SIGNIFICANT G2 TASKS	7-10
2.	G2/G3 PLAY SEQUENCE	16-17

LIST OF FIGURES

		Page
1.	SIMTOS-23 TIMELINE	21
2.	INDIVIDUAL AND JOINT DECISION VARIABLES IN SIMTOS-23	22

I. SIMTOS-23

RESEARCH CONSIDERATIONS

THE G2 FUNCTION

The central research problem of adding a live G2 player to the G3 SIMTOS is to design a structure which facilitates the observation and measurement of G2's decisions and which preserves, at the same time, sufficient realism for the player's behavior to remain experimentally meaningful. The demands for control of the experiment generally militate against those factors which represent the real-life situation. The selection of player tasks, therefore, invariably represents a compromise between realism and experimental needs.

Our analysis showed that three questions, in particular, had to be resolved regarding the conceptual approach to the design of the SIMTOS G2 function.

The first question dealt with the fact that in real life, a G2 would have a staff which in SIMTOS is simulated by the computer data base containing recommendations. The second important point to consider was the desirability of emulating real-life data or information by presenting the G2 with partially accurate intelligence and have him go through the process of sifting and evaluating the computer-generated intelligence reports. The third question involved the G2/G3 interaction and the degree to which it would be profitable to simulate it in SIMTOS. Here considerations of experimental control and individual versus joint G2/G3 scoring determined our recommended approach.

The G2 Staff Function

A careful distinction must be made between the G2 and his staff in the SIMTOS context. In real life, the G2 staff deals with minutiae and prepares conclusions and recommendations for G2's approval. The SIMTOS data base, substituting for G2 staff, could provide the G2 with a choice of recommendations and the G2 task, i.e., decision, would be the selection from a plausible set of recommendations. The advantages of this "multiple-choice" approach are the reduction in G2's detailed work load and greater control for the experimenter since play would proceed from one of several predetermined decision points.

On the negative side, however, it appears that a G2 in real life does not simply select from staff recommendations, but uses his substantial knowledge about the situa-

tion and professional experience to make a reasoned selection or modification of the recommendations presented. It is true that as credibility, quality and accuracy develop within the G2 staff, the G2 will generally come to rely more heavily upon his staff and divorce himself from the minutiae. This does not absolve the G2 of any responsibility, however, and reliance on the staff only occurs after the G2 is thoroughly familiar with the total intelligence function, current or ongoing intelligence situation and good rapport established with the key members of his staff.

In this experiment the G2 is new on the scene. The conditions have not been established for accepting "in the blind" a staff recommendation. It would appear that the only reasonable recommendation the player could be presented is a "school solution" or set of school solutions. If presented one solution it should be the best of school alternatives. If presented a set to choose from, the G2 should be provided all the basic G2 data for reference so that he may select from the set or test the quality or accuracy of the offered solution(s). A wary G2 would do just that. Then the only advantage to be gained in this approach is limiting the G2's choice.

There is yet a stronger argument against using a multiple-choice approach (school solutions), and it is the school factor. The school, and to a lesser degree an experiment, interposes a condition of unreality on the thinking processes of a student/player. He knows that his work in school is going to be graded and that grade determines to a certain extent the future course of his career. He learns early to play the game "their way". He therefore seeks to produce a solution that is a replica of the school solution, subordinating his own professional or intuitive feelings. If he knows, and he would after the first task, that he will be furnished the solution or a set of reasonable alternatives to continue play, then he is likely to lose incentive to exercise diligently the decision making process. His imagination and innovativeness would be constrained.

It is, therefore, recommended that the G2 look over the shoulders of the staff, i.e., call up the data, and arrive at conclusions without the benefit of a school solution to inhibit his own thinking process.

G2/G3 Interaction

In the real world, the G2 function is vital to increase the probability of success on the battlefield. However, the data that the G2 develops may be viewed with varying degrees of skepticism by the staff. The conclusions he

arrives at and recommendations he makes will be accorded different levels of credibility and importance by the different personality types of G3s working alongside the G2. Additionally, his actions are not generally as dramatic as those of the G3 and results are not generally as apparent as the battle is waged.

In a real life situation there is generally very close and continuing coordination, and a running dialogue between the G2/G3 and their respective staffs. Generally, the cross fertilization in the planning phase results in a G2 estimate and recommendations influenced by the G3 assessment and comments. Conversely, the G3 plan is certainly influenced by the G2.

From the experimental point of view, the question is how free should this interaction be, given the constraints of control and time. Furthermore, the problem of scoring is directly affected by the G2/G3 interaction pattern and the play consequences resulting from it.

If interaction were allowed to be completely uncontrolled, then it would be most difficult to determine the individual decisions and scores. Hence the G2 should be tasked in such a way that his informational needs are clearly exhibited. If he performs his tasks in isolation, his decisions can be presented to the experimenter for later scoring.

The problem still remains of how should G2's recommendations, i.e., decisions, be used in the play. It was mentioned earlier that the G3 may not always agree with the G2's conclusions and may tailor his forces along different avenues of approach, select different key terrain features, arrive at a probable enemy course of action different from the one indicated by the G2, etc.

To resolve this question, it is recommended that after the G2 presents solutions to his planning tasks (Response Sheet RS 1 and 2) to the experimenter, he would brief the G3 on his conclusions and recommendations. This would allow for open discussion and interaction between the G2 and G3 and would result in an opportunity for joint scoring and participation of the experimenter. The briefing would provide an opportunity for the experimenter to assess:

- the G2's perception of the type and detail of information needed by the G3 or Commander,

- the quantity and nature of the dialogue between G2 and G3,
- voluntary changes to the G2 conclusions/ recommendations resulting from the G2/ G3 dialogue, and
- the areas of disagreement (if any) between the G2 and G3.

The play could proceed from this point on, based on the G2/G3 decisions or on the school solution. Our preference for a "free" play over using the school solution has been discussed above under staff function.

Integrity of Simulated Intelligence

Consideration was given to deliberately providing false or inaccurate intelligence initially which would then be corrected as play proceeded. Philosophically, that would not be unreal for this peacetime/approaching war/war scenario. The initial separation of forces and political situation would prevent the acquisition of all the accurate information/intelligence the G2 would desire. As the opposing formations close to contact, the quality of intelligence improves. The enemy's intentions are difficult to ascertain until he has committed his forces. Even then, he may exercise certain options which can unbalance the G2's best estimates.

In view of the time limitations in the game play and assessment of the value to be gained by insertion of false data, the idea was rejected. Both trained G2 and G3 players are going to react to any given "situation" and exercise their individual decision making processes. Insertion of false data with gradual correction as play progresses will only result in more frequent reaction to a "situation". It appears that there are sufficient opportunities for observation and measurement of G2's reaction in the proposed scenario.

SUMMARY

The problem of adding a live G2 player alongside the G3 has several components. The substance of G2's decision process is different from that of the G3 whose decision outputs are actions, i.e., allocational or mission decisions in SIMTOS. G2's decision process is heavily weighted by information retrieval and interpretation, whereas his allocational functions are mainly limited to tasking units for intelligence collection.

Since the G2 in SIMTOS operates without his staff, to observe and score his decisions it is necessary either to have him choose from among a fixed set of plausible decisions, or have him arrive at decisions on the basis of a "free" search for information. The former method facilitates baseline scoring, using a school solution as a standard. However, G2's behavioral realism is most likely to suffer because of previous conditioning which favors school-type solutions, as opposed to imaginative or unorthodox approaches. We feel that the latter method is preferable.

The interaction between the G2 and G3 presents a difficult scoring problem. In addition, the conduct of the combat phase is affected by the experimental policy on G3's degree of autonomy from G2's recommendations. Following our preference for realism at the expense of ease of scoring, it is recommended that G2 work out his conclusions, i.e., decisions, which are to be scored, in isolation from the G3. The jointly developed recommendations, rather than the school solution, can then be the basis for the conduct of the combat phase, and the outcome score can be attributed to joint decision making.

Finally, the idea of presenting the G2 with only partially accurate data in deference to realism and having him correlate information to verify and refine his findings, was rejected because it was felt that the process would not, by itself, reveal significantly different decision making behavior on the part of the G2.

PLAYER TASKING

SELECTION OF G2 TASKS

An analysis was made of the doctrinal (FM 101-5) functions and tasks of a typical division intelligence officer (G2) and of the proposed functions and tasks of the G2, enumerated in the draft ARI technical report, "Initial Strategies for the Tactical Operations System (TOS) Support of the Command Control Process." It was determined that the tasks shown in the ARI technical report do not diverge from current doctrine. Significant tasks were selected for further analysis to identify the most appropriate player tasks for the G2, shown in Table 1.

From this set, some of the tasks were dropped from further consideration because of their obvious unsuitability for the SIMTOS exercise (e.g., "Performs the hook up, energizing, initialization and checkout of the TOS console" or "Requests, receives and distributes special studies required for operational planning"). As filtering of the doctrinal tasks continued, those with most potential for application in the SIMTOS were analyzed in greater depth.

The following criteria were established which the task had to meet to become a final candidate as a player task:

- Fidelity to a real-life task, although not necessarily a literal one-to-one translation from real-life tasks;
- Strong impact on G3 planning activity;
- Maximum interaction with the G3;
- Potentially demanding of the G2 to search the data base (query his staff);
- Ability to be scored; and
- Potential for later impact on the combat phase.

Based on these criteria, the following tasks were selected for inclusion in the G2 play.

Task No. 1 Analyze Intelligence Annex of 3d Corps OPORD;

TABLE 1
SIGNIFICANT G2 TASKS

	AMENABLE TO SIMTOS PLAYER TASKING		IMPACT ON SIMTOS DATA BASE	POSSIBLE SCORING CRITERIA - G2	CO-ORDINATION	POSSIBLE SCORING CRITERIA - G3	WHAT DATA SHOULD BE AVAILABLE ON DEMAND	RATIONALE FOR INCLUSION
	YES	NO						
1. PROVIDES TACTICAL INTEL AND INTEG FOR FUTURE OPNS								
1.1 PREPARES INTEL ANNEX TO DIV OPLAN/OPORD								
1.1.1 TASKING ELEMENTS FOR CI CONTROL, SIG SEC AND MLS	x		NONE	SELECTION OF ELEMENTS; COLLECTION; INCLUSION IN ANNEX	1*	----------	SELECT ELEMENTS, TASK AND CALL FOR STATUS REPORT AT X HOUR. COMPUTER PROVIDE ELEMENT STATUS REPORT.	SCORING
1.1.2 ANALYZE INTEL ANNEX OF CORPS (HIGH)	x		NONE	SELECTION OF PERT DATA FOR DIV INTEL ANNEX	3	ACCEPTANCE; REQUEST FOR ADDITIONAL DATA	CORPS INTEL ANNEX AVAILABLE EEI/OIR	SCORING AND INFORMATION IS ESSENTIAL FOR PREPARATION OF DIV ANNEX
1.1.3 PERFORM TERRAIN ANALYSIS								
.1 AVENUES OF APPROACH	x		DELETE	ACCURACY	3	ACCEPTANCE; REQUEST FOR ADDITIONAL DATA	PROVIDE TERRAIN DATA, SOIL CONDITION, TRAFFICABILITY, ETC.	ESSENTIAL IN PLANNING DEFENSE
.2 KEY TERRAIN	x		DELETE	ACCURACY	3	ACCEPTANCE; REQUEST FOR ADDITIONAL DATA	MAP FOR TERRAIN STUDY	ESSENTIAL IN PLANNING DEFENSE
.3 OBJ AND FLD OF FIRE	x		NONE	NEC NO TASK	3	----------	MAP FOR TERRAIN STUDY	
.4 BLOCKING POSITIONS	x		NONE	ACCURACY	3	----------	MAP FOR TERRAIN STUDY	IMPORTANT IN DEFENSIVE PLANNING
.5 IMPACT OF ARMOR OBSTACLES AND FRIENDLY COA	x		NONE	INTERPRETATION	3	----------	CONCLUSIONS TO BE DRAWN BY G2	ESSENTIAL FOR G3 IN DECIDING TROOP DISPOSITIONS, PHASE LINES CONSTRUCTION OF OBSTACLES
1.1.4 PERFORM WX ANALYSIS								
.1 WX PREVAILING FORECAST	x		NONE	ANALYSIS	3	----------	SIMTOS PROVIDE WX DATA AND FORECAST WITH HOURLY UPDATE	IMPORTANT TO G3 PLANNING
.2 IMPACT ON ENEMY/FRIENDLY COA	x		DELETE	ACCURACY	3	----------	CONCLUSIONS TO BE DRAWN BY 2	ESSENTIAL FOR G3 IN DECIDING TROOP DISPOSITIONS, PHASE LINES CONSTRUCTION OF OBSTACLES

* ACof S, G-3 Operations

TABLE 1
SIGNIFICANT G2 TASKS, Continued....

	AVAILABLE TO SYSTEM PLAYER TASKING: YES	AVAILABLE TO SYSTEM PLAYER TASKING: NO	IMPACT ON SYSTEM DATA BASE	POSSIBLE SCORING CRITERIA - G2	CO-ORDINATION	POSSIBLE SCORING CRITERIA - G3	WHAT DATA SHOULD BE AVAILABLE ON DEMAND	RATIONALE FOR INCLUSION
1.1.5 ANALYSIS OF AN SIT								
.1 ORDER OF BATTLE	X		NONE	INTERPRETATION	--	----------	AVAILABLE	ESSENTIAL TO CDR AND G3 IN MAKING ESTIMATES AND OPLAN/OPORD AND FOR INCLUSION IN ANNEX
.2 CURRENT ACTIVITIES		X	NONE	REC NO TASK	--	----------	KNOWN ACTIVITIES	
.3 POSSIBLE COA	X		NONE	NUMBER; VALIDITY	1*	----------	AVAILABLE	SCORING
.4 FRONT LINE TRACE		X	NONE	REC NO TASK	--	----------	AVAILABLE	
.5 UNIT ID, TOC, MISSIONS	X		NONE	COMPLETENESS	--	----------	AVAILABLE	SAME AS ABOVE
.6 RECENT, PRESENT SIGNIF ACTIVITY		X	NONE	INTERPRETATION	3	----------	KNOWN ACTIVITIES	INDICATORS INFLUENCE SELECTION OF FAVORABLE COURSE OF ACTION
.7 PECULIARITIES, WEAPONS	X		NONE	NUMBER HIGH-LIGHTED	3	----------	AVAILABLE	
.8 IDENTIFY INTO GAPS AND COLLECTION MISSIONS	X		NONE	REC NO TASK	--	----------	NONE	
.9 CONCLUSIONS	X		NONE	INTERPRETATION; TIME; FILTERING	3	UTILIZATION	1-7 ABOVE	SCORING - ESSENTIAL TO G3 PLANNING
1.1.6 DEVELOP EEI								
.1 FILL DATA VOIDS	X		NONE	REC NO TASK	--	----------	NONE	
.2 CRITICAL DATA REQUIREMENTS	X		FOO	IDENTIFICATION	3	IDENTIFICATION		SCORING
1.1.7 FINALIZE INTEL ANNEX	X		NONE	COMPLETENESS	3	UTILIZATION	G2 FURNISH HARD COPY TO G3	SCORING

* ACofS, G-3, Operations

TABLE 1
SIGNIFICANT G2 TASKS, Continued....

	AMENABLE TO SIMTOS PLAYER TASKING YES	AMENABLE TO SIMTOS PLAYER TASKING NO	IMPACT ON SIMTOS DATA BASE	POSSIBLE SCORING CRITERIA - G2	CO-ORDINATION	POSSIBLE SCORING CRITERIA - G1	WHAT DATA SHOULD BE AVAILABLE ON DEMAND	RATIONALE FOR INCLUSION
II. PROVIDES ADMIN SUPPORT FOR DIV INTEL OPNS		X	DO NOT INCLUDE	----------	--	----------		
III. PROCESSES, REQUESTS AND DISTRIBUTES INTELLIGENCE AND RELATED ITEMS								
3.1 PROCESSES INTEL INPUTS	X		NONE	UTILIZATION DISSEMINATION	J*	----------	COMPUTER PROVIDE SPOT REPORTS, INTSUMS, SITREPS	SCORING
3.2 REQ RECEIVES, DISTRIBUTES SPECIAL STUDIES		X	DO NOT INCLUDE	REC NO TASK	--	----------	NONE	
3.3 CREATES BRIEFING MATERIAL AND BRIEFS COG	X		CONTINUING INPUT	CONTENT; QUALITY; SIGNIFICANCE	J	----------	NONE	SCORING
IV. SUPERVISES G2 STAFF COLLECTION AND REPORTING EFFORT	X						CURRENT INTSUM PROVIDED ON 1½ HOURLY BASIS. RLS, CI CONTROL, SIGSLC AT AFSE REPORTS EACH 1½ HR. G2 OBTAIN CM/D & ALP REPORT ON COLLECTION ACTIVITY EVERY 1½ HOUR.	SCORING
4.1 COORD UTILIZATION OF ASSETS	X		NONE	COORDINATION	J			SCORING
4.2 SUPERVISES DISSEMINATION OF INTEL & INFO	X		NONE	REC NO TASK	--	----------	NONE	
4.3 SUPERVISES G2 STAFF AND REPORTING EFFORT	X		NONE	REC NO TASK	--	----------	NONE	
V. COORD'S COORDINATES OVERALL COLLECTION EFFORT IN DIV.								
5.1 DETERMINES NEEDS RELATIVE TO MISSION OBJ AND PLANS AND COMPS DIRECTIVES	X		NONE	SELECTION OF EEI; DETERMINATION OF DIV EEI AND OIR	J	ACCEPTANCE	COMPS INTELL ANNEX	SCORING
5.2 DETERMINES PRIORITIES OF NEED	X		NONE	ANALYSIS OF THREAT	J	----------	NONE	

* ACofS, G-3, Operations

TABLE 1
SIGNIFICANT G-2 TASKS, Continued....

	AMENABLE TO SINTOS PLAYER TASKING		IMPACT ON SINTOS DATA BASE	POSSIBLE SCORING CRITERIA - G2	CO-ORDINATION	POSSIBLE SCORING CRITERIA - G3	WHAT DATA SHOULD BE AVAILABLE G3 DEMAND	RATIONALE FOR INCLUSION
	YES	NO						
5.3 DETERMINES PROBABLE ENEMY COA	X		NONE	JUDGEMENTAL	--	ACCEPTANCE)	CORPS INTEL ANNEX. ENEMY DOCTRINE, TACTICS, IN UNIT LOCATIONS	SCORING AND DATA ESSENTIAL TO G3 PLANS.
5.4 DETERMINES TIME LIMITS FOR ASSIGNING TO COLLECT REQUEST	X		NONE	TASKING TECH.	3*	----------	NONE	
5.5 ASSIGNS COLLECTION TASKS	X		NONE	TASKING TECH.	--	----------	NONE	SCORING
5.6 RESOLVES CONFLICTS		X	NONE	REC NO TASK	--	----------	NONE	
5.7 MONITORS STATUS OF COLLECTION ASSETS	X		NONE	REC NO TASK	--	----------	SITREPS SPOT REPORTS	
5.8 INITIATES COLLECTION EFFORT	X		NONE	REC NO TASK	--	----------	SAME	
5.9 MAINTAINS HAT FILE		X	NONE	REC NO TASK	--	----------	NONE	
VI COORDINATES FILES ACCESS AND SECURITY MATTERS		X	NONE	REC NO TASK	--	----------	NONE	
VII. OPERATE TOS		X	NONE	REC NO TASK	--	----------	NONE	

* ACofS, G-3, Operations

Task No. 2	Perform Terrain Analysis;
Task No. 3	Perform Weather Analysis;
Task No. 4	Perform Analysis of Enemy Situation;
Task No. 5	Develop EEI;
Task No. 6	Finalize an Intelligence Annex to the Div OPLAN;
Task No. 7	Determine Probable Enemy Courses of Action;
Task No. 8	Assign Collection Tasks;
Task No. 9	Monitor Collection Effort;
Task No. 10	Determine Needs Relative to Mission Objective and Plans and Corps Directives;
Task No. 11	Determine Avenues of Approach;
Task No. 12	Identify Key Terrain Features;
Task No. 13	Identify Blocking Positions.

STRUCTURING OF TASKS FOR THE G2 PLAY

It is important to bear in mind that while the G2 has a great number of functions and tasks to perform, all of them can be essentially subsumed under three major activities:

(1) Maintain a vast storage of knowledge on the past and current areas of operations, enemy situation and capabilities;

(2) Maintain the intelligence cycle and continually update the intelligence estimate; and

(3) Constantly plan for contingencies, devise new collection schemes and coordinate with other staff and activities, keeping the intelligence annex to the Div OPLAN/OPORD current.

These major functions encompass all the tasks listed above. To avoid confusion, we shall henceforth refer to the thirteen tasks listed above as subtasks and reserve the term "task" for the three major recommended G2 tasks discussed below.

TASK I: COMPLETE SELECTED PORTIONS OF THE INTELLIGENCE ESTIMATE

Specifically, the task requires the G2 to perform a terrain analysis, a weather analysis, analyze the enemy situation, select avenues of approach, key terrain features and blocking positions, and select probable enemy courses of action.

Discussion

This task encompasses subtasks 2,3,4,7,11,12, and 13 from the above list. The analysis of the weather and terrain, identification of key terrain features and blocking positions, if viewed separately, would not have a dramatic effect on the G2's conclusions on probable enemy courses of action. However, collectively, they could reasonably be expected to influence his conclusion. To add to the complexity of his analysis, the severity of weather and terrain could be increased beyond that now in the data base.

The selection of avenues of approach and analysis of the enemy situation are key factors and influence greatly the quality of the G2 conclusions in his estimate. When the G2 has completed this task, the G3 will have access to sufficient data on the area of operations, enemy situation, his capabilities and probable courses of action, to proceed with his task of recommending a course of action, allocation of combat power, and begin work on the OPLAN.

TASK II: PREPARE SELECTED PORTIONS OF THE INTELLIGENCE ANNEX TO 20TH MECH. DIV. OPLAN 37

This task requires the G2 to complete paragraph 3 of the intelligence annex, "Intelligence Acquisition Tasks."

Discussion

This task encompasses, in whole or in part, subtasks 1,5,6,8, and 10 from the above-listed subtasks. In order for G2 to assign intelligence acquisition subtasks, he must know the 3d Corps EEI and Division EEI. Both are contained in SIMTOS. He will need to interact with the G3 to deter-

mine divisional unit missions, sectors and boundaries. He must deduce the division's other intelligence requirements (OIR) and be knowledgeable of adjacent and higher unit locations and missions in order to complete paragraph 3. The G2 and G3 may work concurrently on the preparation of the intelligence annex and the OPLAN, respectively, with close interaction.

TASK III: MONITOR THE INTELLIGENCE COLLECTION AND PREPARE AN INTELLIGENCE SUMMARY FOR FORWARDING TO 3D CORPS

Discussion

This task is derived from subtask 9. During the combat phase, the G2 should monitor the intelligence collection effort, update the intelligence estimate and report significant changes to the G3. The G2 will obtain information/intelligence as the battle progresses, i.e., periodic intelligence reports (PERINTREP) from Corps and adjacent units, situation reports (SITREP), or spot reports from own units. The G2 may record the new data for use in preparing the INTSUM. The G3, in the combat phase, will have the option of reallocating fire power and changing the task organization in reaction to the changing status of his own forces and/or to changes in the enemy situation as reported by the G2.

As examples, it is reasonable to expect the G3 to watch closely his own situation, amount of terrain being held or relinquished, vulnerability of flanks, loss of key terrain, attrition of personnel and equipment, etc. In all probability he will react to those deteriorating conditions by changing priority of fires, unit organizations and missions (delay, defend, withdraw), and calling for artillery and air strikes where needed. It is also reasonable to expect the G3 to react promptly to exploit a new found enemy vulnerability or weakness. The G2 may develop such intelligence from information received from his collection agencies. This then should be passed to the G3 for his consideration and action as appropriate.

G3 Tasks

The tasks assigned to the G3 in the current SIMTOS simulation were analyzed and found to be the most appropriate of the wide range of tasks to select from. Adhering to the doctrinal procedures for staff functions and tasks, as set forth in FM 101-5, the tasks selected are considered to be the most important ones and will have the

greatest impact on the outcome of the combat phase. The current order of task execution was determined to be the most logical one and to follow accurately the sequence of actions in making and executing decisions as shown in FM 101-5.

It is felt, however, that some artificiality may have to be introduced into the experiment at this point as alluded to earlier (in the conclusions section of the brief). Normally, the G2/G3 and the rest of the staff interact very closely in the development of their respective estimates and plans. Frequently, a staff member will require a bit of information or a conclusion from another staff member before he can proceed with his estimate. In close interaction, a response will be provided or at least there will be a dialogue on the issue, even if it is out of sequence for the queried staff member. In this experiment, the G3 is dependent upon certain G2-developed intelligence in order to develop a viable operations plan. The G3 therefore should wait for the G2 to complete his estimate and do so without dialogue or interaction. For purposes of scoring, it is felt that this artificiality should be tolerated.

Based on analysis it has been concluded that the G3 scenario — as it now exists for the defensive — requires no significant modification. Certain frames of information in the data base will require change or deletion, as will be discussed later.

PLAY SEQUENCE

It was mentioned earlier that in real life, there is generally very close and continuing coordination and cooperation between the G2 and G3 and their staffs. Since it is desirable to be able to score the G2 and G3 both individually and jointly, it follows that at least some of their decision making processes should be made in isolation from each other. Granted that it is probably unrealistic to try to determine precisely which functions or tasks the G2 should perform in isolation from the G3, it nevertheless seems reasonable to have the G2 develop the Intelligence Estimate (Task I) without any interaction with the G3. The reasons for this approach are that: (1) G2's decisions and information-accessing record could be evaluated individually and (2) G3 generally needs the outputs of G2's Task I to arrive at his conclusions. The aim is to actually prevent interaction at this stage by depriving the G3 of intelligence information in the data base.

Table 2 shows the play sequence for the Planning and Combat Phase.

The preliminary phase of the experiment includes an interview of the players. The G2 and G3 are then given the Situation Summary, OPORD 63, and other materials to acquaint them with the scenario. A training session on computer procedure concludes the preparatory phase of the play.

Play begins with the Commander's guidance issued to the G2 and G3. The G2 is then asked to complete Task I, Intelligence Estimate, in isolation from the G3. The G3, meanwhile, will study estimates, as contained in the data base, by staff members other than G2.

When G2 completes his Task I, he submits the response sheets to the experimenter for later individual scoring and then briefs the G3.

Briefed by the G2, the G3 begins to work on his tasks, as laid down in Response Sheets No. 1,2, and 3.

The G2 needs specific unit allocation information from the G3 to complete the Intelligence Annex (Task II). At the same time, G3 may request information from the G2.

The interaction between the G2 and G3 during this phase corresponds to the real-life situation, whereas the isolation imposed upon the G2 during his work on Task I is an artifice, justified only by the need for individual scoring.

TABLE 2

G2/G3 PLAY SEQUENCE

PLANNING PHASE

G2 ACTION	G3 ACTION
• Interview	• Interview
• Study Situation Summary, OPORD G3 and Planning Activities Overview	• Study Situation Summary and Planning Activities Overview
• Learn Computer Procedure using Intel Annex to OPORD 63 as vehicle	• Learn Computer Procedure
• Receive Commander's Guidance	• Receive Commander's Guidance
• TASK I: INTELLIGENCE ESTIMATE Submit Response Sheet #1 and #2 to Experimenter	• Use data base to obtain estimates from staff members other than G2
• Brief the G3	
• TASK II: INTELLIGENCE ANNEX Complete Response Sheet #3 Assist the G3 as he calls for data from G2 functional area	• Complete Response Sheets #1, 2, and 3
• Prepare SRI List	• Prepare SRI List

TABLE 2

G2/G3 PLAY SEQUENCE, Continued....

COMBAT PHASE

G2 ACTION	G3 ACTION
• Monitor Progress of Battle and all Aggressor Activity Noted from Spot Reports, Collection Agency Reports SRI Data, etc.	• Monitor all own Forces Status. Adjust Force Structure and Fire Support Units to Counter Threat as Required
• Update Estimate, Annex as Appropriate	• Coordinate with G2 to Determine New Enemy Vulnerabilities or Weaknesses
• Task Units as Appropriate for New Collection Efforts	• Monitor SRI Frames
• Prepare INTSUM	

After the G2 and G3 complete their respective planning phases, they are requested to prepare the Standing Requests for Information (SRI) lists.

In the Combat Phase, the G3 tasks are essentially the same as in the G3 SIMTOS, except that the G3 obtains intelligence information from a live player.

SCORING

A primary objective in the SIMTOS-related research program is to assess the effects of various information systems and formats upon the quality of decisions taken by G2 and G3 officers in a division tactical operations center (DTOC).

Reliable measures of decision quality were developed in an experiment in which scoring standards were based on the U.S. Army Command and General Staff College lesson plans (Krumm, Robins, and Ryan, 1973).

The three major variables and their component measures (Ability Composite, Decision Process Pattern, and Experience Composite) were intentionally defined so as not to take into account the content of the information presented to the subject. A fourth major variable, Facts Possessed, was defined in terms of a scheme which scored the number of facts contained in a CRT display (data base frame).

Analysis of the scoring problem in SIMTOS-23 strongly indicated that there are two fundamental issues that must be resolved in order to render the SIMTOS-23 version useful as a research tool. The first issue is the need to develop measures of G2/G3 interaction that can be reliably associated with tactical outcomes. The second issue is the natural consequence of the first one, i.e., how to assess the individual contributions to final tactical outcome, apart from the jointly developed decisions by the G2 and G3.

The following is a set of interaction measures which suggest themselves as potentially useful in influencing the outcome:

- Frequency, a binary (yes-no) record of an interaction when it takes place.
- Volume, i.e., a "bulk" measure of how much information was transferred from one player to the other. The current Facts Possessed measure could be used as a basis for developing the information transfer measure.
- Response, measuring the extent to which the G3, in free play, accepted the facts or recommendations by the G2.

The response measure is really a composite measure, because G2's recommendations may be good or bad, while G3 may accept or reject good or bad advice.

SELECTION OF BEST SUBSET OF REGRESSION VARIABLES

A review of the recent literature in regression analysis yielded a method of selecting a best subset of regression variables which can be applied directly to the problem of discriminating between the G2 and G3 influence on play outcome. The method, by R.R. Hocking, is especially appropriate, because it also addresses the more general problem of optimizing the set of independent variables out of an initial set of potential candidate measures (Enslein, Ralston, and Wilf, 1977). Hocking's method thus frees the experimenter from the constraint of having to fix a priori the independent variables to be used in the multiple regression analysis.

We propose the following methodology for evaluating the decision making performance of the two players in SIMTOS-23.

Referring to Figure 1, the proposed SIMTOS-23 play, in broad outline, consists of two phases (planning and combat) and possible G2/G3 interaction at all times except during G2's Task I. The time slots or blocks, t_1, t_2, t_3, etc., indicate that the play can be subdivided or thought of as consisting of some number of time slots, bracketing subtasks and major tasks. The time blocks simply serve to delineate data classes, to distinguish observations of the <u>same</u> task at different times.

Assuming the validity of the independent variables (decision measures) established by Krumm, Robins, and Ryan in the G3 experiment, a set of SIMTOS-23 variables can be constructed consisting of current G3 variables for the G3 acting alone, the same variables for the G2 acting alone, and some interaction measures, as indicated earlier. The observed values of each variable during specified time slots constitute the set t of independent variables that can be used in multiple linear regression analysis, as outlined in Figure 2.

The experimenter is now faced with the question of which subset s of the original t variables should be used to best describe a particular response, or outcome y. Thus the investigator must determine, based on the existing data, <u>both</u> the number of variables in the subset regression

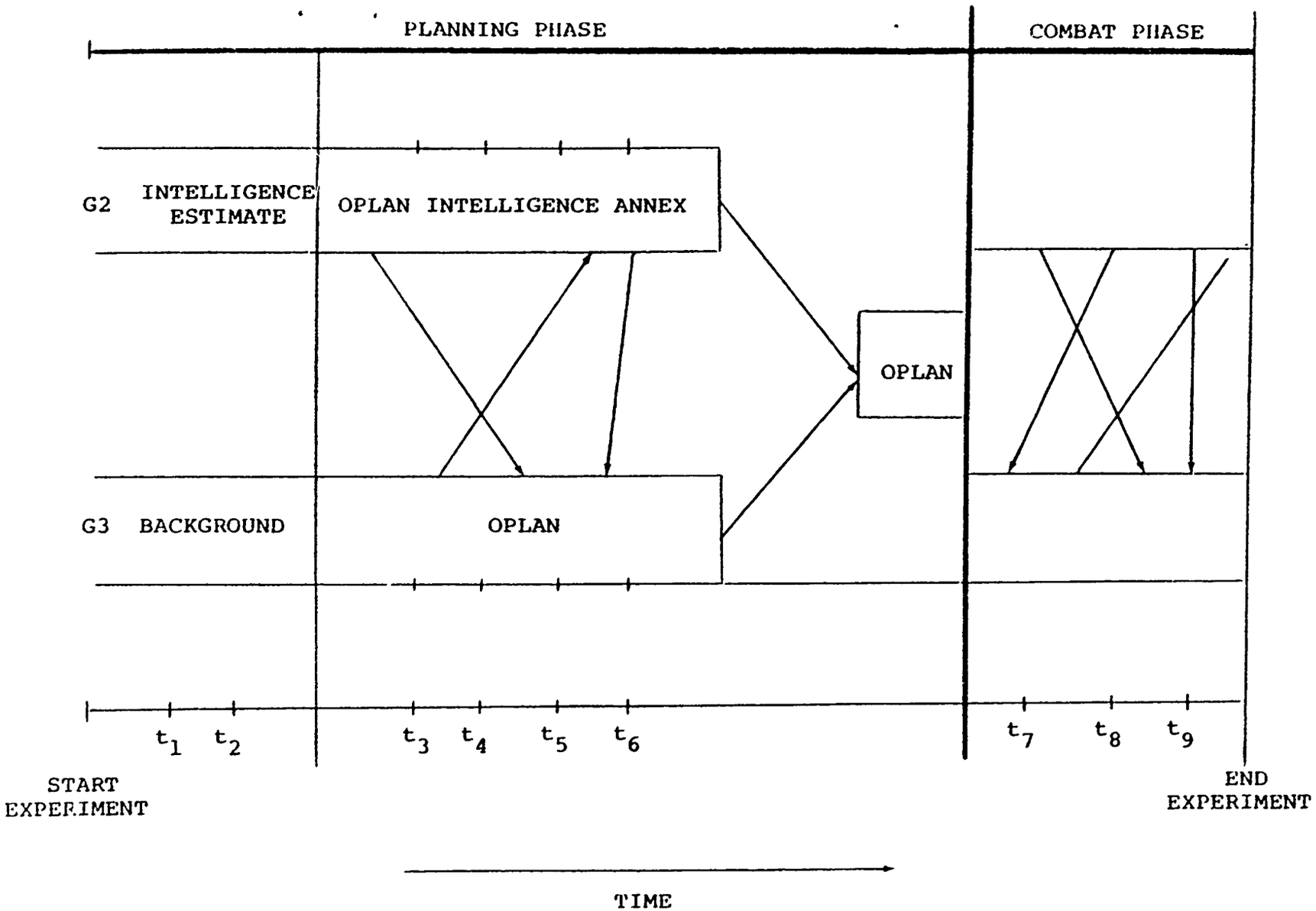

FIG. 1: SIMTOS-23 TIMELINE

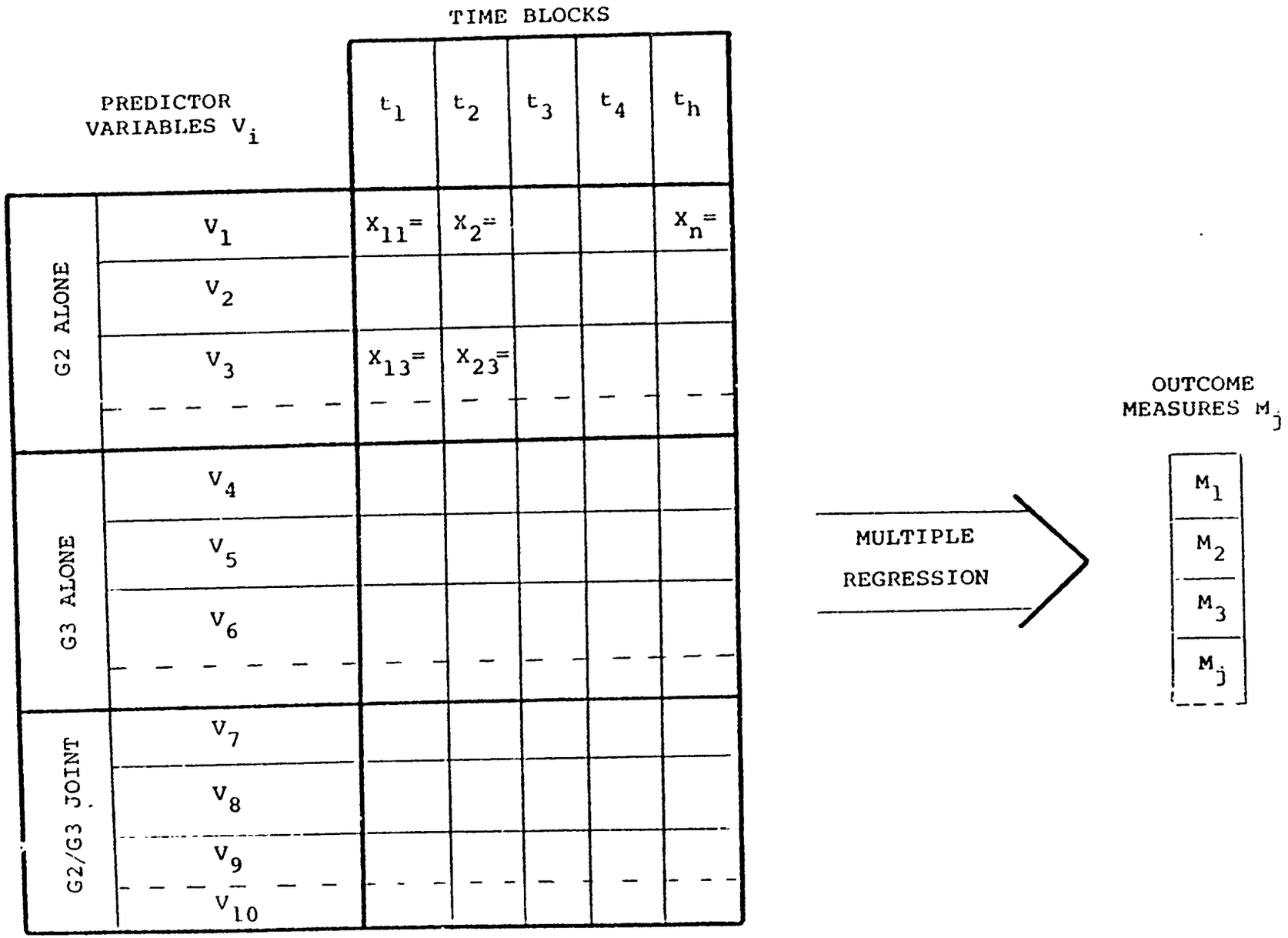

FIG. 2: INDIVIDUAL AND JOINT DECISION VARIABLES IN SIMTOC-23

and the best subset of that size. A common definition, for example, of the "best" subset of size s is the one with the smallest residual sum of squares (RSS).

Hocking's algorithm allows the experimenter to specify a range of subset sizes, say between 1 and k, and the output will contain, for each set size, the particular variables that yield the "best" criterion and, of course, the value of the criterion. If, for example, RSS were used as the criterion, then the values of RSS, as a function of set size k, would decrease. The shape of the RSS function would generally indicate a break-point, that is, the subset size beyond which it is not profitable to go, because the decrease in RSS is relatively insignificant.

In sum, we propose that having postulated an initial set of decision variables, the experimenter can establish relatively easily the optimal set of variables to be tested in SIMTOS-23. The method of best subsets in a multiple regression analysis will exhibit the relative influence of decisions made by the G2 alone and jointly with the G3 on the final outcomes. For each outcome (success) measure, a different subset of decision variables can be expected to be found by the algorithm as the one that best "explains" the outcome.

SIMTOS DATA BASE MODIFICATIONS

An analysis has been made of the Defensive Planning Bulk Data Base, dated 7 December 1974, supporting the G2 experiment and the Defensive Planning Bulk Data Base, dated 7 August 1974, supporting the G3 experiment.

The intelligence operation generally follows a four phase cycle. The phases are:

(1) directing the collection effort,

(2) collecting the information,

(3) Processing the collected information into intelligence, and

(4) Disseminating and using the intelligence developed.

The cycle is continuous and all phases are active concurrently after starting the cycle by planning and directing the collection effort. Activation of the cycle is based upon plans, orders and requests from higher, lower, and adjacent headquarters and the specific initiative and inquisitiveness of the G2 and his staff, and most importantly, with a thorough understanding of his unit's mission.

In our consideration of the extension of the SIMTOS, it was assumed that the intelligence cycle had been activated well prior to the G2 reporting for duty. The bulk data base reflects that condition and the G2 must have access to the data base immediately to "come onboard". However, in our analysis and selection of tasks for the G2, it became apparent that certain of the bulk data frames should be deleted or modified to deprive the G2 of machine-furnished solutions. The reason for this modification is that in our game design, the G2 will have the responsibility to seek basic data produced by the active intelligence cycle to the extent that he, as an individual, feels necessary to arrive at certain essential conclusions.

G2 DATA BASE

The data provided the G2 in the G2 experiment is very complete, containing an abundance of information, more than adequate for G2 player introduction and use during the planning phase. Data provided in the G3 experiment is in-

sufficient for a live G2 player and some of the data is in the form of solutions to tasks proposed earlier in this report for the G2 in SIMTOS-23. With modification to some frames in the G2 experiment data base, they could be used in lieu of the G2 data now provided in the G3 experiment data base.

Modifications recommended include:

- Changing as required all date/time groups on frames to bring G2 scenario in track with the G3 scenario;
- Reviewing and changing as required all coordinates to insure that they track with the G3 scenario.
- Number all frames in the Planning Phase 0000;
- Where now there are 0100-0200 and 0300 frames presenting the initial data plus update, synthesize the information from frames 0100 and 0200 into one frame of information representing that which the staff will work with throughout planning;
- Deleting all 0300 frames for potential use in the Combat Phase;
- Delete certain frames that now provide solutions to what are now recommended G2 tasks.

G3 DATA BASE

The G3 data base requires minor modification. Recommended changes include:

- Delete in its entirety what is now provided as G2 data and use instead the modified data base from the G2 experiment.
- Examine the "Table" data base. Remove from the G3 access to all information the G2 would normally possess.
- Remove all information the G2 would normally have to acquire from his "staff" the SIMTOS computer.

It is envisioned that for game purposes, all G2 data would be privileged at the outset with only the G2 having access. This would prevent an anxious G3 from calling up basic G2 data and arriving at his conclusions unilaterally before the G2 completed his initial set of subtasks.

After the G2 has completed his estimate, only the data G2 had accessed would become available to the G3. This would generate player interaction if the G3 wanted to challenge the G2, or seek basic data to verify a conclusion. It would prevent the G3 from preempting the G2, and cause the G3 to request additional data from the G2 who would be obliged to call it up.

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II. SIMTOS-OD

RESEARCH CONSIDERATIONS

The central purpose for the expansion of SIMTOS to two-sided play, Aggressor G3 versus Defensive G3, is to exploit the capabilities of SIMTOS as a research tool for:

- Observing, measuring, and comparing live player performance against a vigorous live opponent in contrast to the performance of one live player against a computer.

- Determining the utility of various decision aids when employed against widely divergent aggressor tactics.

- Determining the implications for the current SIMTOS data base given the different aggressor tactics.

ASSUMPTIONS

In order to bound the research effort, it was necessary to make certain assumptions. They are:

- There could be an expert Aggressor G3 provided by the experimenter;

- Free play can be permitted the defending force G3 throughout the planning and combat phases; and

- Modifications to the current SIMTOS data base and scenarios are acceptable.

DISCUSSION

Scenario

A decision maker acts or reacts to a given "situation" or set of "conditions" which exist or occur without warning. Without perfect intelligence, a situation or condition results from a move or counter move by an opponent. In this experiment, any new "situation" will result from a change in the status quo. This will cause the decision maker to initiate a decision making cycle to recover from an unfavorable situation, to exploit a favorable change in his force status or to capitalize on a new found enemy weakness. A change in status quo may be brought about by a function of the computer program or by a live Aggressor G3 (AG-3). The use of a live Aggressor G3 provides an opportunity to examine a

G3's decision processes and information needs under a much wider variety and less predictable set of conditions than would be practical through computer simulation.

Expert AG-3

Past experiments have engaged players with certain specified qualifications, experience or education. Expert knowledge of Circle Trigon doctrine, tactics and principles of force organization and employment were not player requisites. While each may have possessed some knowledge in this field, it is considered highly unlikely that any could have been considered expert. Experimentation utilizing a U.S. trained and experienced staff officer to fulfill the role of an AG-3 against a live DG-3 is thought to be impractical and counterproductive for the following reasons:

- In order to compete favorably with a trained DG-3 player, each AG-3 player would require special and extensive training on Circle Trigon doctrine and tactics, force structure, unit and equipment capabilities, and methods of employment. If this was not accomplished, it is postulated that his performance would be habitually inferior to that of the DG-3.

- Again, if the AG-3 was not trained, his expected performance should be substantially inferior to that of his counterpart on the staff of a real CAA (Combined Arms Army) or component division. Assuming this expectation to be correct, it appears that data accumulated on the opposing players would lack validity; the AG-3 would be generally frustrated, and the DG-3 would obtain a distorted, perhaps grossly distorted, view of a real world AG-3's capabilities and talents.

- Because of the similarity in background, training and experience of the opposing players, it is believed that each could predict or anticipate with considerable accuracy the actions of the other in a given situation, giving a false indication of the planning and execution decision aid needs.

- It was concluded that an AG-3 player who is an expert on Circle Trigon doctrine and tactics should be used in OD SIMTOS.

Control of Expert AG-3

Another significant factor in the analysis was the inherent advantages that would accrue to the expert AG-3 in

the experiment setting combined with the actual advantages held by a real world Circle Trigon G3. At first glance this would seem to contradict the above conclusion and warrants further discussion.

The expert AG-3 will have considerable facility in the operation of the computer, an acquired knowledge of the data base and knowledge of the terrain. Through his U.S. military experience and training, he (AG-3) will know well the U.S. force tactics and doctrine and concepts for employment of those U.S. forces his intelligence sources (data base) have been able to identify. In all probability, his knowledge in these matters and his ability to act with speed and agility at the outset will be superior to that of a real life Circle Trigon G3.

An Aggressor G3 generally has several undeniable advantages over a defensive force. The initiative belongs to him; he selects the time, place, method, force structure, and environmental conditions which are most advantageous to him.

He possesses the advantage of surprise and first strike capability. He has many opportunities for deception, e.g., establishment of a dummy division/regimental command radio net; maintaining a steady flow of routine radio traffic from fixed location "command posts" while units are actually positioning themselves on the line of departure (LD) under cover of darkness and radio silence.

Many units may be prepositioned for the attack under the guise of continuing a field training exercise. He selects the avenues of approach which will best suit his needs and may conduct rehearsals in rear areas to fine tune selected elements for special operations (e.g., river crossings).

After the assault has been initiated, he remains the aggressor, selects his own objectives and may exercise many options for changing direction and force tailoring. Additionally, in the SIMTOS scenario, the 16 CAA logistic tail extends over hundreds/thousands of kilometers of relatively secure land lines. This facilitates extravagant expenditures of resources to support the attack and penetration of the defended area. As a result, the duration and magnitude of his preparatory and supporting fires are not greatly restricted.

Essentially, the aggressor orchestrates the offensive plan, initial assault, and continues until fully committed

and slowed or halted, at which time the baton is passed to the defender or counterattacking force.

In the OD SIMTOS, the AG-3 will have the opportunity to exercise these decided advantages and try to spread chaos, inflict maximum casualties, and disorganize the defenders as much as possible. It is conceivable that the AG-3 could alter his plans, force structure, axes of approach, etc., at such frequency that the DG-3 in reacting would fail to complete a plan, or if a plan was completed, fail to execute because of a new turn of events. For purposes of this experiment, that would be counterproductive. Control should be exercised to prevent this from happening.

It is recommended that the experimenter impose constraints on the AG-3 in order to maintain some semblance of balance between the opposing G3s. The following are suggested for use as a minimum:

- The AG-3 should not have access to the DG-3 plans, U.S. Corps or Div OPORD nor any intelligence that he would not reasonably be expected to have in a real situation.

- Restrict the AG-3 to the same rules for unit movement rates, rates of fire, and reasonable ammunition loads as the DG-3.

- It would not be unreasonable to restrict the AG-3 to a selection from two or more preselected axes of approach into the Hof gap and to predesignate his objectives. These are oftentimes determined and specified by higher headquarters (Army Group OKCIDENTO). Such restriction would facilitate increased control in the experiment.

- Support CG 20 Mech Div assumption that the 16 CAA has tactical nuclear weapons and the delivery means, but they will not be employed in this experiment.

SIMULATION OF THE INTELLIGENCE FUNCTION

The data base provides for the DG-3 portions of the enemy order of battle, avenues of approach, tactics of Circle Trigon Forces, and the DG-2 analysis of the situation and his conclusions. It is recommended that an experimenter provide the DG-3 with a map display portraying the essential elements of the DG-2 analysis and conclusions. This would allow the DG-3 to concentrate more on G3 functions and less on G2 detail. The DG-2 map should display information/intelligence that the DG-2 could reasonably be expected to acquire.

A moderate to low level of accuracy and truth could be given that initial DG-2 display. That is to say, the AG-3, having the initiative in planning and conducting the attack, will organize and begin positioning his forces well before the DG-3 does comparable planning. The DG-2 would not be expected to have the wherewithall, foreknowledge or facility to require high quality or large volume of intelligence on the enemy at this point in the play.

The AG-3 will perform his functions with a high level of secrecy, will employ deception and delay prepositioning of as much of his force as possible until the last moment. It is, at this point, that the experimenter would be called upon to make a subjective judgement as to the quantity and quality of intelligence the opposing DG-3 will have at the outset.

That subjective judgement will be reflected in the DG-2 frames in the bulk data base and on the map display boards for use by the DG-3. The frequency with which the experimenter will be called upon to exercise his subjective judgement cannot be determined at this juncture. It could be one time for all experiments, as would be the case if the AG-3 begins each experiment with the same course of action (COA) in his attack planning. It could be required for each experiment, from new data generated by the AG-3 having total free play authority and selecting a new COA for each experiment. This will be addressed further in the section "AG-3 Play Options".

AG-3 PLAY OPTIONS

Introduction of a live AG-3 presents an opportunity for testing, scoring, and measuring the DG-3 under conditions that possibly or practically could not be simulated by a computer. Engaging a live AG-3 does present a great variety of scoring, measuring, and control problems. Use of an expert AG-3 substantially reduces the number of potential problems and limiting the freedom of action of the AG-3 does so even more. Imposing too many controls on the AG-3, however, is self-defeating. The experimenter must examine the various alternatives and select the one most appropriate to the specific purpose of the experiment, facilities and time available, utility or value of data collected and computer capacity. Some of the alternatives are discussed below.

- Allow the AG-3 uninhibited free play in each experiment in both the Planning and Combat Phases. This will allow a great variety of tactics to be employed, wide selection of avenues of approach and intermediate objectives, virtually unlimited unit combinations in the AG-3 task organization and, may or may not match a "standardized" attack scenario. The AG-3 planning would precede that of the DG-3 and would occur with limited intelligence on 3d Corps unit dispositions. It would also require programming of the AG-3 data base and portions (G2 primarily) of the DG-3 data base after the AG-3 prepares each plan. As the AG-3 moves to the Combat Phase, and the first actions, reactions, counteractions occur, the computer will not "know" with any degree of certainty what is going to happen next. The computer will have to keep up with the action, compute and report status of forces to opposing G3s on a periodic basis. This approach may be unacceptable to the experimenter simply because of the volume of administrative work required to support it in the time available.

- A second alternative would be to limit the AG-3 to a few (1-5) courses of action to select from. In this case, the AG-3 could prepare 1-5 plans, task organizations, OPORDs, etc., in advance and programming and administrative work could be accomplished prior to the beginning of all experimentation. This preselection would lock the AG-3 into a force posture at the beginning of the Combat Phase, but would allow free play from that point to conclusion. Additionally, an experimenter could examine the courses of action, make subjective judgements at leisure about the intelligence the DG-2/DG-3 would normally

have acquired and preprogram the DG-2 data appropriate to each AG-3 COA.

- A modification to the second alternative would be to disallow AG-3 free play in combat and let the computer carry the selected COA in a standardized attack. This modification is not in keeping with the intended purpose of two-sided play and is not recommended for use.

- A third alternative considered was to limit the AG-3 to only one COA for all experiments for the planning phase yet allow complete free play beginning with his attack. Advantages to this approach include: minimal data base modification; only one subjective judgement required of the experimenter; and all DG-3 players begin play with the same basic bulk data and one subjective judgement on the quality and quantity of intelligence provided to their G2. All of these will facilitate scoring, measurement, and comparison. Furthermore, this would not impair free play for the DG-3 in planning and combat, or the AG-3 in the Combat Phase.

The third alternative is recommended. Should this be adopted AG-3 actions, in addition to the above, would include: the preparation of a course of action recommendation; task organization; mission statement, etc., in short, an Operations Plan for the Attack. An Operations Overlay should be prepared showing boundaries, phase lines, objectives, ect., and in this instance the AG-3 should prepare the intelligence estimate and intelligence annex to the OPLAN. The estimate and annex would be developed from the bulk data base frames provided him which would be reflecting the subjective judgement of an experimenter.

- A scenario and exhibits for an AG-3 have not been prepared, since for the most part their contents would be predicated on the alternative selected from the above or devised by the experimenter, or perhaps more importantly because they should be developed by the selected expert AG-3 to satisfy his unique approach to a Circle Trigon aggressive action plan.

SIMTOS MODIFICATIONS

GENERAL

The introduction of a live AG-3 suggests the need for certain modifications to the SIMTOS On-Line Facility and to the bulk and table data base, and additional hardware subsystems.

It is envisioned that the AG-3 and DG-3 would require for simultaneous use/input/output devices equipped with CRT, keyboard and peripherals, as well as a duplicate set of map boards, tables, desks, enemy (U.S.) order of battle plaques for positioning battalion/brigade size forces on map boards, etc.

It is strongly recommended that the AG-3 and DG-3 be located in separate rooms, or as a minimum, isolated from each other with soundproof partitions.

The individual players should be restricted from access to data belonging exclusively to the other side.

Duplicate experimenter stations serving each player will be a requirement. It is recommended that a fifth position be considered for use by an experimenter. This experimenter could serve in the capacity of Chief Umpire/ Experimenter Controller. In that capacity he would ensure that the rules of the experiment were adhered to, monitor planning and combat phase timing and without bias provide decisions and guidance to players to maintain an orderly progression of events in the game.

The combat algorithms appear valid and the technique used for their employment is a reasonable compromise for control purposes. Computational methods previously applied for attrition values remain valid.

Restricting the players to a set of alternative actions they may take in planning and combat simplifies scenario development, data base production and measurement and scoring. At the same time, it virtually defeats the in-

tended purpose of experimentation with opposing live players.

Allowing unlimited free play by opponents presents so many variables that the effort expended in dealing with them would most likely obscure the basic purpose of the experiment.

DATA BASE

An analysis was made of the G3 Defensive Planning and Defensive Combat Bulk Data Base dated 7 August 1974, as well as the Offensive Planning (29 April 1975) and the Offensive Combat Bulk Data Base. The purpose was to determine the potential use of those data bases in an AG-3/ DG-3 free play scenario.

The data bases referred to above were developed as one-sided war games with the DG-3 and the AG-3 conducting operations against a computer-executed, standardized attack and a standardized defense, respectively. The two-sided war game presents a wide range of new conditions and variables with which the one-sided play did not deal. It may be necessary to modify and expand the current defensive G3 Bulk Data Base to allow for more flexibility in dealing with a variety of DG 3 plans resulting from free play in the planning phase.

Planning Phase

A condition which is now common to both the DG-3 and the AG-3 data base is that both have some salvage value in the planning phases due to the use of an expert AG-3.

In both data bases, the factors for assessing combat performance remain valid, but the AG-3 performance need not be subjected to rigorous analysis unless the experimenter elects to tabulate and score the AG-3 performance as a new data source as proposed in the scoring section. The method used in determining the G3 performance and decision process remains valid for the DG-3 and need not be applied to the AG-3. With the exception of the possible changes to the DG-2 section of the Defensive Planning Bulk Data Base, as discussed in the section on the Intelligence Function, that data base could remain virtually unchanged.

Combat Phase

The Defensive Combat Bulk Data Base, due to the condition of free play by the AG-3 and DG-3, may require major revision. The magnitude of any revision will depend strongly on the experimenter's decision on the degree of latitude allowed the AG-3 at the outset.

The current SIMTOS defensive scenario exhibits and tasks, with minor modifications, appear adequate for support of the DG-3 in the two-sided play being examined. An example of a modification would be to delete those portions pertaining to task organization on OPORD-37, unit boundaries, etc., leaving those for the DG-3 to develop as he sees fit from acquired intelligence and application of his personal training, experience and intuition.

SCORING

A prime objective in the SIMTOS research program is to assess the effects of various information systems and formats on the quality of decision making by G3 and G2 officers in a division tactical operations center (DTOC).

Reliable measures of decision quality were developed in experiments with G3 subjects in which scoring standards were based on the U.S. Army Command and General Staff College lesson plans (Krumm, Robins, and Ryan, 1973).

The introduction of a live AG-3 who is an expert on Circle Trigon doctrine and tactics does not warrant changes in the scoring scheme as presently used when the DG-3 plays against the machine, because the live opponent will potentially affect the same skills and decision processes of a G3 as the machine did.

It is recommended that the AG-3 not be scored except as follows:

It would be of considerable interest to compare the experimental results obtained in the man-machine play to the results obtained in OD-SIMTOS. In such a comparison the scoring methodology for the DG-3 would be kept the same and the expert AG-3 would be presumed to represent an experimental "constant". In order to minimize the inevitable human variables it is recommended that a standard set of rules be established for the AG-3. This would tend to stablize the conduct of the expert AG-3 for each experiment and would also facilitate the use of alternate expert AG-3 as the need arises.

Additional data could be obtained by scoring the live AG-3 to determine his learning curve of the SIMTOS game. The OD-SIMTOS experimental data should include those experiments when the live AG-3 was still learning the game.

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APPENDIX A
DEFENSIVE SCENARIO EXHIBITS
G2

EXHIBIT 1

Situation

During the past three months, the political situation in Europe has deteriorated rapidly. Diplomatic relations have been broken off between Circle Trigon and Western governments, including the U.S. There has been considerable military activity along the entire West German/Circle Trigon Border during recent weeks. This activity is being "covered" under the pretext of conducting annual fall maneuvers.

To counter the military threat of the Circle Trigon buildup, the 30th U.S. Army has been airlifted to Germany to supplement NATO forces. The 30th Army is now in assembly areas along the Circle Trigon Border, with the 1st and 2nd Corps in the north and the 3d Corps in the south.

The 20th Inf. Div. (Mech) is a reserve unit, recently mobilized. It is within the 3d Corps and is now on combat alert in an assembly area in West Germany. The 3d Corps has been directed by 30th Army to prepare to defend the KASSEL (NB3585), ERFURT (PB4348), SCHWEINFURT (NA8845) triangle.

Assume that you are the G2 of the 20th Mech. Div. Your role will be:

- To complete portions of the intelligence estimate essential to the operations planning to accomplish the 20th Mech. Div. mission as specified in the 3d Corps OPORD 63;

- To prepare portions of the intelligence annex to the 20th Mech. Div. OPORD 37;

- To interact with the G3 to satisfy his intelligence needs in a timely manner; and

- To monitor the intelligence functions, intelligence collection effort and interact with the G3 during the execution of the defense of the division sector during the attack from the east.

EXHBIT 2

(CLASSIFICATION)

3D CORPS
KRONACH
(PA6668)
142100SEP74

OPORD 63

REFERENCE: Map, HOF-PLAUEN, 1:50,000; GERMANY, 1:250,000

TASK ORGANIZATION:

1. SITUATION:

a. Enemy Forces: Annex A, Intelligence

b. Friendly Forces:

(1) 1st Corps and 2nd Corps prepare defensive positions on north (left) flank of 30th Army.

(2) 3d Corps prepares defensive positions in sector from BERGA (TS9926) to HAZLAU (URO760)

(3) Elements of 9th AF provide Tac Air support

c. Attachments and Detachments: Task Organization

2. MISSION:

3d Corps to move immediately to defensive positions and in event of attack defend in sector for up to 30 days to permit build-up of NATO forces.

3. EXECUTION:

a. Concept of Operation: Annex B, Operation Overlay

(1) Maneuver

3d Corps to establish defense in sector with the 57th Inf. Div. (Mech) on the north, 20th Inf. Div. (Mech) in the center and 74th Inf. Div. (Mech) in the south. The 56th Armor Div., Corps reserve vic NORDHALBEN (PA7883).

(CLASSIFICATION)

Line divisions establish GOP NLT 150600SEP74.

(2) Fires

Priority of arty and tac air support to 57th Mech. Div., 20th Mech. Div., and 74th Mech. Div. in that order, and to Corps counter-attacking forces on committment. Annex C, Fire Support.

b. 20th Mech. Div.

(1) Prepare to defend in sector.

(2) Prevent enemy from penetrating west of hills 729 (PA8678), 795 (PA8873), and 726 (PA9066).

(3) Establish GOP.

c. 74th Mech. Div.

(1) Prepare to delay in sector.

(2) Canalize enemy along SELB (TR9562).

(3) Establish GOP.

d. 57th Mech. Div.

(1) Prepare to defend in sector.

(2) Prevent enemy from penetrating west of GORKWITZ (PB9798) GORITZ (PA9890) Autobahn.

(3) Establish GOP.

e. Arty:

(1) FA:

(a) 61 Arty Gp: GSR 20th Mech. Div.

(b) 62 Arty Gp: GSR 57th Mech. Div.

(c) 63 Arty Gp: GSR 74th Mech. Div.

(d) 401 Arty Gp: GS

(2) ADA:

(a) 1-439 Arty: Atch 20th Mech. Div.

(b) 2-439 Arty: GSR 74th Mech. Div.

(c) 3-439 Arty: GSR 57th Mech. Div.

f. 301 Cml Bn (Smoke Genr): Atch 74th Mech. Div.

g. 51 Engr Bde:

(1) Support defensive operations employing 56th Engr Bn (CBT) on the north, 54th Engr Bn (CBT) center, and 55th Engr Bn (CBT) in the south.

(2) Priority of effort in order, construction of blocking positions, preparation of obstacles, and road maintenance.

h. Aviation:

(1) 129 Avn Bn: DS 20th Mech. Div.

(2) 130 Avn Bn: DS 57th Mech. Div.

(3) 131 Avn Bn: DS 74th Mech. Div.

i. SUPCOM:

(1) Remain in present position.

j. Res:

(1) 56th Armd Div.

(a) Be prepared to ctr-atk in Corps north flank area.

k. Coordinating Instructions:

(1) Units will construct obstacles as required to cause maximum restriction to enemy movement. Roads or other high-speed avenues of approach will be blocked in depth. Barriers will canalize enemy attack into killing areas.

(2) Destruction of population centers and communications, transportation, utilities, mining, factories, and port facilities will be minimized.

(3) Use of chemical contaminants requires specific Army approval.

(4) Any destruction that may have strategic impact will require Army approval prior to execution.

(5) Barrier and denial operations must not unduly restrict future Army operations particularly to the north.

(6) Gaps and lanes in Army directed barriers behind FEBA to be closed only on Army order.

(7) Nuisance mines will not be authorized.

(8) Barrier construction may be initiated without further orders.

(9) Nuclear expenditures are not authorized.

4. SERVICE SUPPORT
ADMIN/LOG PLAN 63:

5. COMMAND AND SIGNAL:

a. Signal:

(1) SOI Index 1-3

(2) Annex, E, Signal

b. Command: Corps Tac CP with 74th Div.

Acknowledge.

MALONE
MG

Annexes: A - Intelligence
B - Operation Overlay
C - Fire Support (omitted)
D - Engineer (omitted)
E - Signal (omitted)

Distribution: A
2nd Corps

OFFICIAL
/S/FARLEY
G3

EXHIBIT 3

(CLASSIFICATION)

3D CORPS
KRONACH (PA6668)
142100 SEP 74

ANNEX A (Intelligence) to OPORD 63

Frames 2217117 - 2217118 G2 Defense Data Base

(CLASSIFICATION)

EXHIBIT 4

GUIDE TO THE SIMTOS DATA BASE

GENERAL INDEX

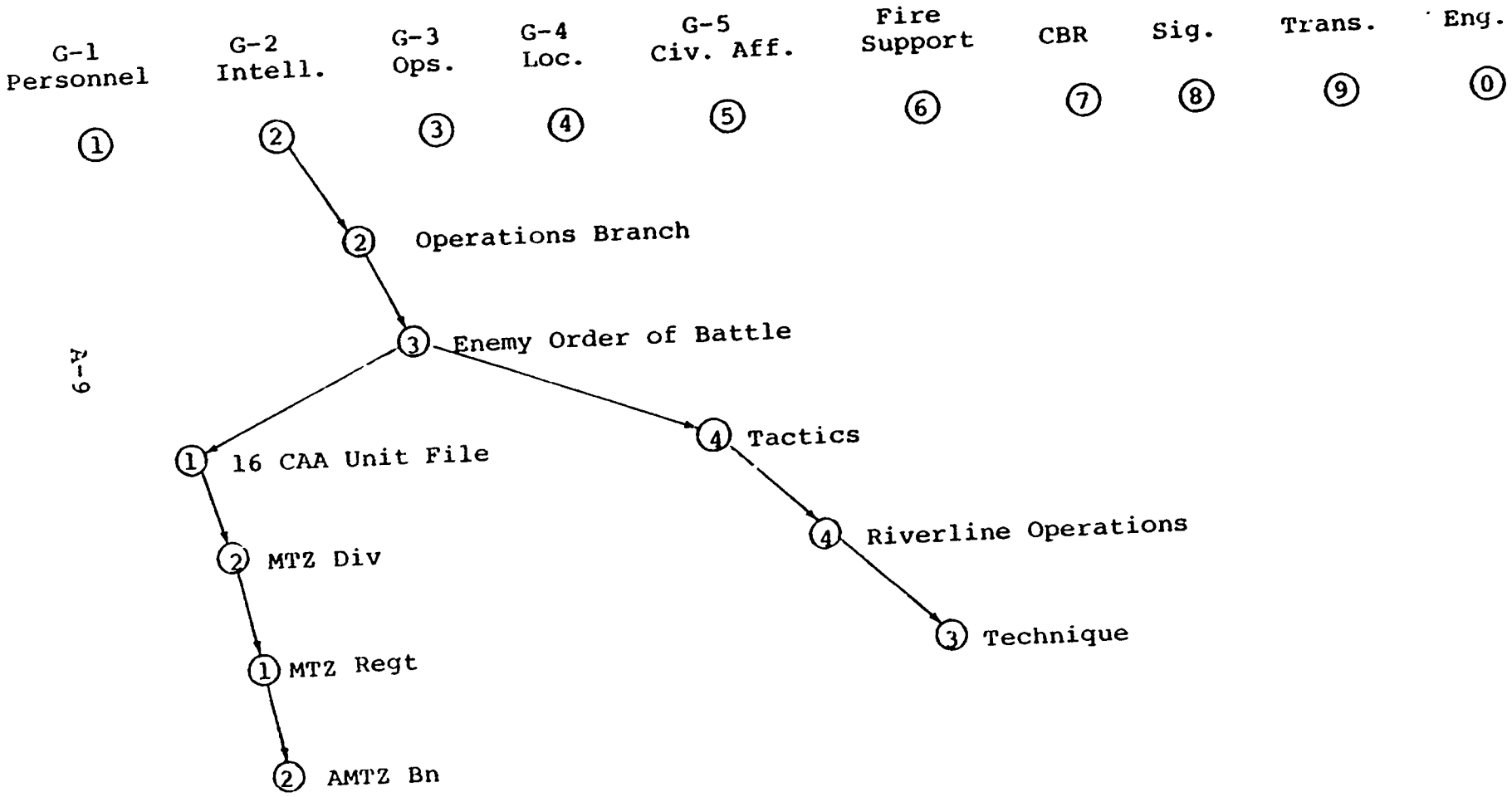

EXHIBIT 5

PLANNING ACTIVITIES

Your planning will be divided into major phases:

- Collect, analyze, and develop conclusions for presentation to the G3 by completing selected portions of the Intelligence Estimate.

- Development of selected portions of the Intelligence Annex to the 20th Mech. Div. OPLAN.

Your staff aid will provide you with the "commander's guidance," appropriate maps/overlays and your specific task requirements at the beginning of Phase I.

When you have completed your Phase I planning tasks, contact the experimenter via the telephone (press 7R). He will then provide you with the "commander's guidance" and your specific task requirements for Phase II.

When you have completed your Phase II planning tasks, contact the experimenter via the telephone (7R). You will then have a break before participating in the combat session. You will have a maximum of one hour for each of these phases.

Administrative Note

If you have to leave your work station any time during today's problem, please contact the experimenter via the telephone as you leave, and when you get back. In this way, our time records will shown only the time you were actually working on the problem.

Date/Time

For purposes of the study, assume that today's date is 14 September 1974 and it is now 2100 hours.

EXHIBIT 6

20th INF. DIV.
(MECH)
142100SEP74

TO: ..G2

FROM: CG

SUBJECT: Intelligence Estimate

1. You are requested to prepare an intelligence estimate to assist in accomplishment of the 20th Mech. Div. Mission as indicated in 3 Corps OPORD 63.

2. Mission

(a) Our mission is to defend along the Saale River line in sector.

(b) Division planning will proceed on the basis of an area defense.

(c) We must employ a general outpost, however, Corps has not specified a location.

3. I am particularly interested in the impact of weather on EN and own forces, location of key terrain and good blocking positions, and avenues of approach into our defensive area.

4. I'm also quite interested in your assessment of EN capabilities, his situation, composition, disposition, and his porbable course(s) of action.

CG

EXHIBIT 7

INSTRUCTIONS

A. On Response Sheet #1 complete the following:

1. Effects of weather on enemy courses of action.

2. Effects of weather on own courses of action.

B. On 1:50,000 SITMAP indicate:

1. Location of key terrain features.

2. Avenues of approach into Div Defensive Area. Designate the Avenues alphabetically for ease of identification.

3. Blocking positions in the Div Defensive Sector.

When you have completed the above, contact aide via the telephone _____ at that time.

RESPONSE SHEET 1

WEATHER

Factors Considered	Impact on EN COA		Impact on Own COA	
	Yes	No	Yes	No
_____	____	____	____	____
_____	____	____	____	____
_____	____	____	____	____
_____	____	____	____	____
_____	____	____	____	____
_____	____	____	____	____
_____	____	____	____	____

NARRATIVE CONCLUSIONS:

Impact on EN COA _____

_____

_____

_____

_____

Impact on Own COA _____

_____

_____

_____

_____

EXHIBIT 8

INSTRUCTIONS

A. On Response Sheet 2 list and discuss briefly 2-4 apparent capabilities.

B. Select and discuss briefly the most probable course of action you expect the enemy to pursue.

C. Identify any vulnerabilities of the enemy that the G-3 should consider during his defensive planning.

D. On 1:50,000 SITMAP show disposition of Bn size forces in relation to your selected most probable course of action.

E. Be prepared to present your estimate with conclusions to the G-3/CG.

You will have _____ minutes to complete the above task, please contact your aide via the telephone _____ at that time.

RESPONSE SHEET 2

ENUMERATE ENEMY CAPABILITIES

1. _____
_____

2. _____
_____

3. _____
_____

4. _____
_____

CONCLUSIONS

A. PROBABLE ENEMY COURSES OF ACTION

_____
_____
_____
_____
_____
_____
_____
_____
_____

B. VULNERABILITIES

_____
_____
_____
_____
_____
_____
_____

EXHIBIT 9

INSTRUCTIONS

1. At this point you will have completed the G-2 (Intelligence) estimate. The G3 is now receiving planning guidance and will begin preparation of a recommended course of action and allocation of combat power.

2. You will now prepare the Intelligence Annex to the 20 MECH DIV OPLAN/ORD.

3. Coordinate as required with the G3. Provide the G3 intelligence data as required.

4. On Response Sheet #3 prepare paragraph 3 (Intelligence Acquisition Tasks) of the Intelligence Annex.

5. Update the SITMAP as appropriate.

6. You will have one hour to complete the above, please contact your aide via the telephone _____ at that time.

RESPONSE SHEET 3

Copy No._____ of _____ Copies
20 MECH DIV
WEST GERMANY
150001 SEP 74

ANNEX A (Intelligence) to OPORD 37

. . . . . .

3 Intelligence Acquisition Tasks

A. _____

B. _____

CG

EXHIBIT 10

DEFENSIVE SCENARIO

Combat Session Briefing

Situation

A. You are asked to continue in the role of G2 of the 20th MECH DIV.

B. The Division Commander has considered all defensive planning recommendations and the 20th MECH DIV OPLAN 37 was approved by 3D CORPS. (Copy attached)

C. All units have now moved to defensive positions as portrayed on the Operations Overlay for OPORD 37.

Your Tasks

You are to monitor the tactical situation as it develops and to refine your estimate as new data becomes known about the enemy locations, dispositions, identifications, etc. Assist and keep the G3 informed of significant events.

At exercise time, 151440 SEP, prepare an INTSUM for distribution.

You may task units for additional intelligence collection efforts as the need for new or additional data becomes apparent.

Time

After you have been instructed in how to operate the CRT keyboard, the exercise will begin. The exercise start time/date will be 151240 SEP. The start will be signaled by the general index automatically appearing on your CRT.

This Exhibit is shown for example only. OPORDER 37 will be a reflection of the completed G2/G3 tasks. It will be prepared in hard copy during the break between planning and combat phases.

EXHIBIT 11

(CLASSIFICATION)

(No change from verbal orders)

EC-D3
Copy 2 of 12 copies
20 MECH DIV
CULMITZ (011159) GERMANY
150300SEP74

OPORD 37

REFERENCE: A - Map, (Germany 1:50,000, HOF - PLAUEN)

B - Map, (Central Germany - 1:250,000)

C - Overlay (20 Mech Div Area of Operations)

TASK ORGANIZATION

1st bde

1-66 Mech
1-67 Mech
1-68 Mech
1-1 Armd
1-45 FA(DS)
B/1-439 ADA
A/20 Engr(DS)

2d Bde

1-69 Mech
1-70 Mech
1-71 Mech
1-2 Armd
1-46 FA(DS)
B/20 Engr(DS)

3d Bde

1-72 Mech
1-3 Armor
2-21 Cav
1-47 FA Bn-Grp
1-47 FA
2-631 FA (155-SP)
(remains attached)
A/1-439
C/20 Engr(DS)

DIV TRP

20 Engr (-)
20 AVN
20 SIG
20 MP Co

DISCOM

(CLASSIFICATION)

DIVARTY

1-48 FA
1-49 FA
1-439 ADA (-)

20 Admin Co
20 Maint Co
20 Med
20 S&T

1. SITUATION

a. Enemy Forces

(1) The Aggressor 16 Combined Army is expected to attack through the Hof Gap with probable objective to secure the rail heads vic COBURG (PA4070).

(2) Concentrations of enemy forces suggest that main attack may occur in 20 Mech Div sector along Avenue of Approach (Alpha). See overlay.

(3) Secondary attacks can be expected along Avenues of Approach (Bravo), (Charlie), and (Delta). See overlay.

(4) Enemy units opposing 20 Mech Div are approximately 95 percent TO/E.

(5) Annex A (Intelligence).

b. Friendly Forces

(1) 3d (US) Corps prepares to conduct mobile defense in sector NLT 150400SEP with 57 Mech Div in the north, 20 Mech Div in the center, and 74 Mech Div in the south. 56 Armd Div is Corps reserve with priority of employment to 74 Mech Div. 401st Arty Gp protects in priority Corps: FDA, Corps reserce, corps command post.

(2) 26 (UK) Armd Div supports 3d (US) Corps.

(3) Elements of 9th Tactical Air Force support 3d (US) Corps.

(4) 61st FA Grp GSR 20th Mech Div.

2. MISSION

20 Mech Div defends NLT 150400SEP from (120270) to (200120), retains Hills 715 (PA8678), 794 (PA8873) and 726 (PA9066) and delays Aggressor east of the Saale River (190180) FEBA for 24 hours.

3. EXECUTION

a. Concept of Operation (Annex B Operation overlays)

(1) Manuever. 20th Mech Div conducts area defense of the Saale River from (115275) to (200130). 1st Bde defends in the north. 2d Bde defends in the south. 3d Bde, div res, prepared to counter-attack to restore the FDA, priority to sector of 1st Bde. 3d Bde establishes div GOP of two battalions to obtain 24-hour delay.

(2) Fires. Priority of artillery and close air support first to the GOP, to the 1st Bde upon withdrawal of the GOP, to the div res when committed.

b. 1st Bde:

(1) Defends in Sector

(2) Prepare in priority: blocking position 1,2, and 3.

c. 2nd Bde:

(1) Defends in Sector

(2) Prepares in priority: blocking positions 4,5,6.

d. 3rd Bde:

(1) Establishes GOP immediately with two battallion-sized task force; delays enemy forward of FEBA for 24 hours.

e. ARTY:

(1) FA:

(a) 1-45 FA: DS 1st Bde

(b) 1-46 FA: DS 2d Bde

(c) 1-47 FA: Form 1-47 FA Bn-Gp; after group ceases GSR 1-46 FA; DS 3d Bde on committment.

(d) 1-47 FA Bn-Gp:

1-47 FA
2-631 FA

Attached 3d Bde; attachment and Bn-Gp cease on withdrawal of GOP.

(e) 1-48 FA: GSR 1-47 Bn-Gp; on withdrawal GOP, GSR 1-45 FA

(f) 1-49 FA: GS

(g) 2-631 FA Atch 1-47 FA Bn-Gp; after group ceases GSR 1-46 FA

(2) ADA:

(a) 1-439 ADA (-): Pr ct in priority: division reserve, division command post, DISCOM.

(b) A-439 ADA: atchd 3d Bde; on withdrawal of GOP; atchd 2d Bde

(c) B/1-439 ADA: atchd 1st Bde

(3) Annex C, Fire Support

f. 20 Mech Div Aviation: GS; support 3d Bde with A/20 Avn until withdrawal GOP

g. 20 Mech Div Engr: (-): GS; priority to the reserve. On withdrawal GOP, C/20 Engr: DS 3d Bde

(1) 20 Engr

(2) Annex D (Engineer)

h. Reserve: (-)

(1) Battalion Task Force of 3d Bde until withdrawal of GOP.

(2) 3d Bde after with drawal through FEBA.

(3) Prepares to execute Div counterattacks, priority to 1st Bde sector.

(4) Prepare to release one company for rear area security.

i. Coordinating Instructions

(1) Bdes in FDA support GOP withdrawal.

(2) 1st and 2d Bdes destroy Saale River Bridges in sector upon withdrawal of GOP.

(3) Priority of road movement to GOP force on withdrawal through sector.

4. SERVICE SUPPORT: ANNEX E

DISCOM operational in vicinity SCHWARZENBACK (PA8774) NLT 150100SEP.

5. COMMAND AND SIGNAL: ANNEX F

Div CP opens in vicinity of CULMITZ (011159) 150300 SEP.

ACKNOWLEDGE

Smith
MG

OFFICIAL;

JONES
G3

Annexes A - Intelligence (omitted)
B - Operation Overlays

EXHIBIT 11

EC-D3

TROOP LIST AND CODE INDEX

UNIT	CODE	WPN	UNIT	CODE	WPN	UNIT	CODE	WPN
1ST BDE			**2D BDE**			**3D BDE**		
1-66 Mech Bn	703		1-69 Mech Bn	720		1-72 Mech Bn	741	
A/1-66	704		A/1-69	721		A/1-72	742	
B/1-66	705		B/1-69	722		B/1-72	743	
C/1-66	706		C/1-69	723		C/1-72	744	
1-67 Mech Bn	712		1-70 Mech Bn	733		1/49 Arty	763	HJ MSL
A/1-67	713		A/1-70	734		A/1-49	764	HJ MSL
B/1-67	714		B/1-70	735		B/1-49	765	HJ MSL
C/1-67	715		C/1-70	736				
1-68 Mech Bn	716		1-71 Mech Bn	737				
A/1-68	717		A/1-71	738				
B/1-68	718		B/1-71	739				
C/1-68	719		C/1-71	740				
1-1 Armd Bn	707		1/2 Armd Bn	724				
A/1-1	708		A/1-2	725				
B/1-1	709		B/1-2	726				
C/1-1	710		C/1-2	727				
1/45 Arty	747	155MM(SP)	1-46 Arty	751	155MM(SP)			
A/1-45	748	155MM(SP)	A/1-46	752	155MM(SP)			
B/1-45	749	155MM(SP)	B/1-46	753	155MM(SP)			
C/1-45	750	155MM(SP)	C/1-46	754	155MM(SP)			

TROOP LIST AND CODE INDEX

UNIT	CODE	WPN
GOP FORCE		
1-3 Armd Bn	728	
A/1-3	729	
B/1-3	730	
C/1-3	731	
1-47 Arty	755	155MM(SP)
A/1-47	756	155MM(SP)
B/1-47	757	155MM(SP)
C/1-47	758	155MM(SP)
2-631 Arty	766	155MM(SP)
A/2-631	767	155MM(SP)
B/2-631	768	155MM(SP)
C/2-631	769	155MM(SP)
1-48 Arty	759	8 inch
A/1-48	760	8 inch
B/1-48	761	8 inch
C/1-48	762	8 inch
1/21 ACS	795	
A/1-21	796	
B/1-21	797	
C/1-21	798	
C/1-21	799	

UNIT	CODE	WPN
DIVARTY		
1-439 Arty	800	C/V
A/1-439	801	VULCAN
B/1-439	802	VULCAN
C/1-439	803	CHAPARRAL
D/1-439	804	CHAPARRAL
61 ARTY GROUP		
1-61 Arty	811	HJ MSL
A/1-61	812	HJ MSL
B/1-61	813	HJ MSL
2/61 Arty	714	155MM(SP)
A/2-61	715	155MM(SP)
B/2-61	716	155MM(SP)
C/2-61	717	155MM(SP)
3/61 Arty	818	155MM(SP)
A/3-61	819	155MM(SP)
B/3-61	820	155MM(SP)
C/3-61	821	155MM(SP)
4/61 Arty	822	8 inch
A/4-61	823	8 inch
B/4-61	824	8 inch
C/4-61	825	8 inch
5-61 Arty	826	8 inch
A/5-61	827	8 inch
B/5-61	828	8 inch
C/5-61	829	8 inch

UNIT	CODE
54 ENGR	
1-54 Engr Bn	831
A/1-54	832
B/1-54	833
C/1-54	834
D/1-54	835
HQ	
20 Engr Bn	778
A/20	779
B/20	780
C/20	781
D/20	782
E/20	783
129 AVN	849
Aslt Co.	850
C . Spt Co.	851
TAC AIR SQDN 15	852
Flt A	853
Flt B	854
Flt C	855

EXHIBIT 13

DECISION AIDED SIMTOS

Thank you for your participation as a consultant in this effort to develop automated support systems for Army Officers. We know that it has been a strenuous day, but we would appreciate a few more minutes of your time. Your answer to the following questions can help us refine our research and fulfill our objective of producing military information systems that are responsive to your needs. This information, as well as the rest of today's materials, is confidential.

Personal Data

Name _____ Present Rank _____

Age _____ Years of Active Military Service _____

Present Position _____

Military Experience

1. Please summarize your military experience in chronological order in the spaces provided. Please emphasize any previous G3 experience.

YEAR	UNIT (Co. Bn. Div.)	TYPE (Inf. Mech. Armd)	POSITION HELD (CO, G-3, etc)	DURATION (Months)	LOCATION (Country)	COMBAT (Months)
____	_____	_____	_____	_____	_____	_____
____	_____	_____	_____	_____	_____	_____
____	_____	_____	_____	_____	_____	_____
____	_____	_____	_____	_____	_____	_____
____	_____	_____	_____	_____	_____	_____
____	_____	_____	_____	_____	_____	_____

2. If you have ever participated in ATT, CPX, FTX or Map exercises in West Germany, please fill in the following blanks. If you have never participated in these activities, continue to the next question.

YEAR	UNIT (Co., Bn., Div.)	POSITION (Cmdr. X-O, Etc.)	Type and Number of Exercises
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

Education

3. Please indicate (✓) whether you have attended any of the following Army schools. If you have, please fill in the supplementary blanks.

a) U.S. Army Command and General Staff College

Year Graduated _____

b) National War College (Ft. McNair)

Year Graduated _____

c) Army War College (Carlisle Barracks)

Year Graduated _____

4. Please circle highest year completed:

College 1 2 3 4 Degree _____ Field _____

Graduate 1 2 3 4 5 Degree _____ Field _____

Review of SIMTOS

Please ✓ your response.

5. Were you satisfied with the way you were contacted to participate as a consultant? YES NO

6. Although SIMTOS is not an operational tactical information system, the knowledge being gained from its study will serve as the background for the development of future decision support systems.

With the design of these future systems in mind, how would you rate SIMTOS (as you used it today) performance, i.e., how well did it help you accomplish your mission?

Fair 1 2 3 4 5 Excellent

Would you agree or disagree with the following statement: Military information systems must be responsive to the information requirements and "command style" of the user.

Agree Disagree

7. In which of the following functions would you prefer to use an automated system instead of a staff officer (please check ✓).

Intelligence Gathering
Troop Organization
Logistical Planning
Contingency Planning
Implementation of Orders
Communication
Other

Thank you again for participating in the evaluation of decision-aided SIMTOS. We would welcome any further comments on these efforts.

APPENDIX B
DEFENSIVE SCENARIO EXHIBITS
G3

EXHIBIT 1

Situation

During the past three months, the political situation in Europe has deteriorated rapidly. Diplomatic relations have been broken off between Circle Trigon and Western governments, including the U.S. There has been considerable military activity along the entire West Germany/Circle Trigon Border during recent weeks. This activity is being "covered" under the pretext of conducting annual fall maneuvers.

To counter the military threat of the Circle Trigon buildup, the 30th U.S. Army has been airlifted to Germany to supplement NATO forces. The 30th Army is now in assembly areas along the Circle Trigon Border, with the 1st and 2nd Corps on the north and the 3d Corps in the south.

The 20 Inf. Div. (Mech) is a reserve unit, recently mobilized. It is within the 3d Corps and is now on combat alert in an assembly area in West Germany. The 3d Corps has been directed by 30th Army to prepare to defend the KASSEL (NB3585), ERFURT (PB4348), SCHWEINFURT (NA8845) triangle.

Assume that you are the G-3 of the 20 Mech Div. Your role will be:

a. To complete portions of the defensive planning to accomplish the 20 Mech Div. mission as specified in 3d Corps OPORD 63, and

b. To supervise and execute a defense of the division sector during an attack from the east.

No contingency plans are available. OPLANS are badly out of date.

EXHIBIT 2

(CLASSIFICATION)

3D CORPS
KRONACH (PA6668)
142100SEP74

OPORD 63

REFERENCE: Map, HOF-PLAUEN, 1:50,000; GERMANY, 1:250,000

TASK ORGANIZATION:

1. SITUATION:

a. Enemy Forces: Annex A, Intelligence

b. Friendly Forces:

(1) 1st Corps and 2nd Corps prepare defensive positions on north (left) flank of 30th Army.

(2) 3d Corps prepares defensive positions in sector from BERGA (TS9926) to HAZLAU (UR0760).

(3) Elements of 9th AF provide Tac Air support.

c. Attachments and Detachments: Task Organization

2. MISSION:

3d Corps to move immediately to defensive positions and in event of attack defend in sector for up to 30 days to permit build-up of NATO forces.

3. EXECUTION:

a. Concept of Operation: Annex B, Operation Overlay

(1) Maneuver

3d Corps to establish defense in sector with the 57th Inf. Div. (Mech) on the north, 20th Inf. Div. (Mech) in the center and 74th Inf. Div. (Mech) on the south. The 56th Armor Div., Corps reserve vic NORDHALBEN (PA7883). Line divisions establish GOP NLT 150600SEP74.

(CLASSIFICATION)

(2) Fires

Priority of arty and tac air support to 57th Mech. Div., 20th Mech. Div., and 74th Mech. Div., in that order, and to Corps counter-attacking forces on commitment. Annex C, Fire Support.

b. 20 Mech. Div.

(1) Prepare to defend in sector.

(2) Prevent enemy from penetrating west of hills 729 (PA8678), 795 (PA8873), and 726 (PA9066).

(3) Establish GOP.

c. 74 Mech. Div.

(1) Prepare to delay in sector.

(2) Canalize enemy along SELB (TR9562).

(3) Establish GOP.

d. 57th Mech. Div.

(1) Prepare to defend in sector.

(2) Prevent enemy from penetrating west of GORKWITZ (PB9798) GORITZ (PA9890) Autobahn.

(3) Establish GOP.

e. Arty:

(1) FA:

(a) 61 Arty Gp: GSR 20 Mech. Div.

(b) 62 Arty Gp: GSR 57 Mech. Div.

(c) 63 Arty Gp: GSR 74 Mech. Div.

(d) 401 Arty Gp: GS

(e) 2-631 (155) (SP) Arty; Atch 20 Mech. Div.

(2) ADA:

(a) 1-439 Arty: Atch 20 Mech. Div.

(b) 2-439 Arty: GSR 74th Mech. Div.

(c) 3-439 Arty: GSR 57th Mech. Div.

f. 301 Cml Bn (Smoke Genr): Atch 74 Mech. Div.

g. 51 Engr Bde:

(1) Support defensive operations employing 56th Engr Bn (CBT) on the north, 54th Engr Bn (CBT) center, and 55th Engr Bn (CBT) in the south.

(2) Priority of effort in order, construction of blocking positions, preparation of obstacles, and road maintenance.

h. Aviation:

(1) 129 Avn Bn: DS 20 Mech. Div.

(2) 130 Avn Bn: DS 57 Mech. Div.

(3) 131 Avn Bn: DS 74 Mech. Div.

i. SUPCOM

(1) Remain in present position.

j. Res:

(1) 56th Armd Div

(a) Be prepared to ctr-atk in Corps north flank area.

k. Coordinating Instructions:

(1) Units will construct obstacles as required to cause maximum restriction to enemy movement. Roads or other high-speed avenues of approach will be blocked in depth. Barriers will canalize enemy attack into killing area.

(2) Destruction of population centers and communications, transportation, utilities, mining, factories, and port facilities will be minimized.

(3) Use of chemical contaminants requires specific Army approval.

(4) Any destruction that may have strategic impact will require Army approval prior to execution.

(5) Barrier and denial operations must not unduly restrict future Army operations particularly to the north.

(6) Gaps and lanes in Army directed barriers behind FEBA to be closed only on Army order.

(7) Nuisance mines will not be authorized.

(8) Barrier construction may be initiated without further orders.

(9) Nuclear expenditures are not authorized.

4. SERVICE SUPPORT
ADMIN/LOG PLAN 63:

5. COMMAND AND SIGNAL:

a. Signal

(1) SOI Index 1-3

(2) Annex, E, Signal

b. Command: Corps Tac CP with 74th Div.

Acknowledge.

MALONE
MG

Annexes: A - Intelligence (omitted)
B - Operation Overlay
C - Fire Support (omitted)
D - Engineer (omitted)
E - Signal (omitted)

Distribution: A
2nd Corps

OFFICIAL
/S/FARLEY
G3

EXHIBIT 3

Planning Activities

Your planning sequence will be divided into two phases:

- Recommendation of a Course of Action
- Development of the Operations Plan

Your staff aide will provide you with the "commander's guidance" and your specific task requirements at the beginning of Phase I.

When you have completed your Phase I planning tasks, contact the experimenter via the telephone (press 7R). He will then provide you with the "commander's guidance" and your specific task requirements for Phase II.

When you have completed your Phase II planning tasks, contact the experimenter via the telephone (7R). You will then have a break before participating in the combat session. You will have a maximum of one hour for each of these phases.

Administrative Note

If you have to leave your work station any time during today's problem, please contact the experimenter via the telephone as you leave, and when you get back. In this way, our time records will show only the time you were actually working on the problem.

Date/Time

For purposes of the study, assume that today's date is 14 September 1974 and it is now 2100 hours.

EXHIBIT 4

GUIDE TO THE SIMTOS DATA BASE

GENERAL INDEX

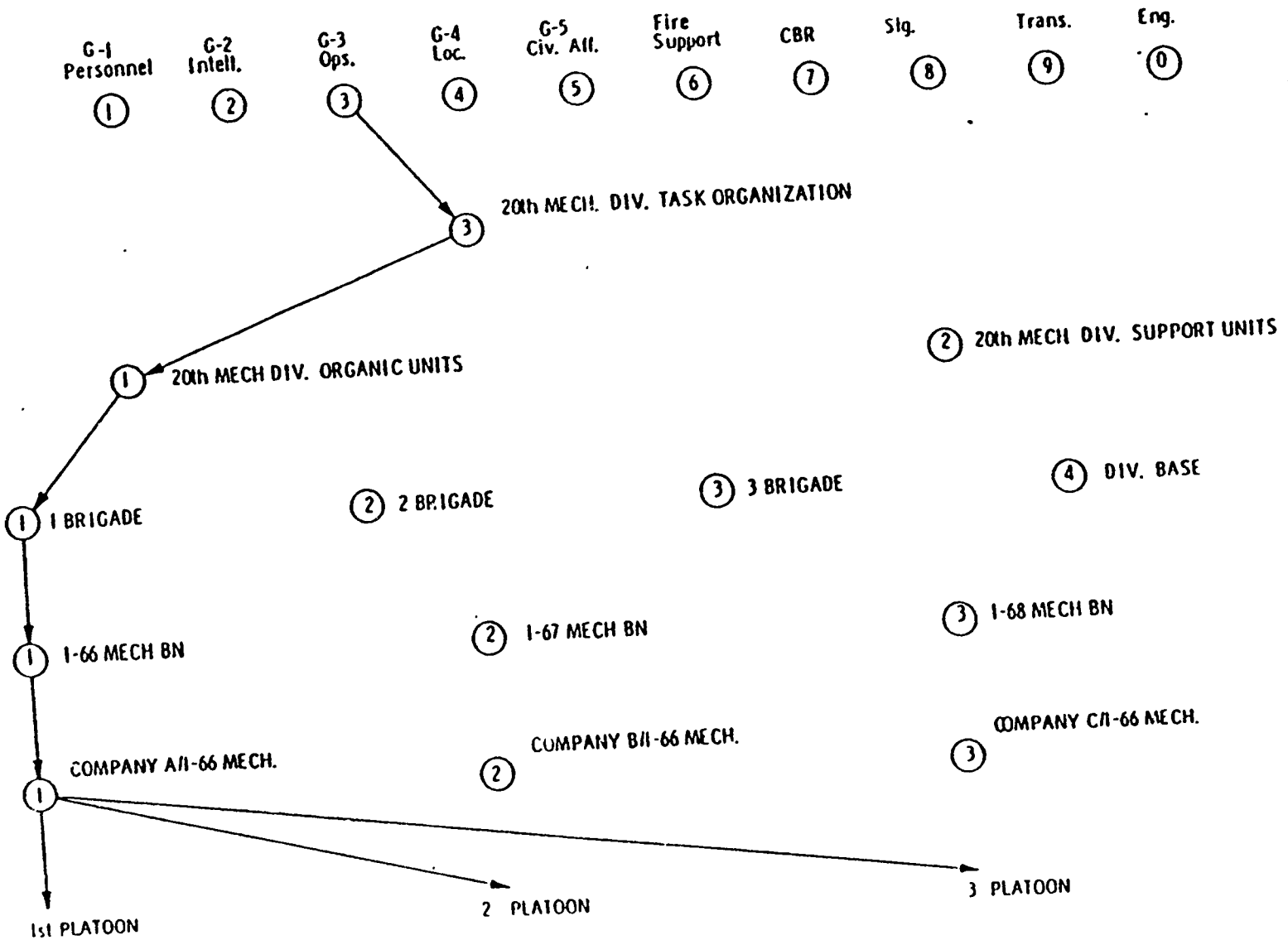

EXHIBIT 5

20 INF DIV (MECH)
142100SEP74

TO: G3

FROM: CMDR

SUBJECT: Recommendation of a Course of Action

You are requested to prepare recommendations to accomplish the 20 Inf. Div. Mission as indicated in OPORD 63. Base your work on the following considerations:

1. Form of Defense

Considerations of terrain and relative mobility are most significant. The rugged terrain along the Saale River (QA0187-QA0973) provides good cover and concealment, excellent observation of the river valley and good to excellent fields of fire. Therefore, division planning will proceed on the basis of an area defense.

2. Mission

(a) Our mission is to defend along the Saale River line in sector.

(b) We must employ a general outpost. The Corps Commander has not specified the location of a GOP. Organize and locate the GOP with sufficient strength to provide at least 24 hours for us to prepare blocking positions.

3. Organization of Defense Sector

We will organize our defense sector and conduct the defense primarily to retain terrain in the forward defense area taking maximum advantage of the Saale River obstacle. The ridge formed by Hills 715 (PA8678), 794 (PA8873), and 726 (PA9066) must be retained to support corps counter-attack operations. The division reserve must be located where it can block penetrations, counter-attack to regain terrain, and add depth to the defense.

4. Course of Action

(a) In developing a course of action consider retention of key terrain and the obstacle value of HOF (QA0878).

(b) In developing your recommended course of action, coordinate with the G2 and other members of the staff and consider their estimates as you deem appropriate. Disagreements with any estimate, especially that of the G2, is not discouraged but is to be brought to my attention.

(c) Tactical infiltration may be employed. It is assumed that nuclear weapons will not be used.

5. Deadline

Your recommendation is required NLT 150001SEP.

SMITH
Commander

EXHIBIT 6

INSTRUCTIONS:

A. On Response Sheet #1, complete the following:

1. Allocation of CBT Power to Echelons of Defense

a. GOP Force by Unit

b. FDA Force by Unit

c. Reserve Force by Unit

2. Specific type of resistance by each echelon on defense (delay, screen, defend)

B. On 1:50,000 SITMAP overlay, indicate location of:

1. GOPL

2. COP coordination point

You will have one hour to complete the above, contact aide via the telephone (7R) at that time.

RESPONSE SHEET #1

ALLOCATION OF COMBAT POWER TO ECHELONS OF DEFENSE

Column (1) MISSION: Enter one of the following: delay, defend, screen, reconnoiter, counterattack.

Column (2) SECTOR: Indicate the portion of the 20 Mech Div sector in which the major unit will operate. Enter reserve, rear area security, or north, center, south on FDA.

Column (3) AVENUE: Enter Avenue or Avenues of Approach against which the unit will operate (A, B, C, D, E) as appropriate.

Column (4) SUBORDINATE UNITS: Enter all maneuver and support units allocated to the Bde headquarters, and indicate GOP composition by an asterisk (*). Cross-attach company sized units if you wish. If unit is in support role, indicate GS, GS Reinf., or DS.

MAJOR UNIT	(1) MISSION	(2) SECTOR	(3) AVENUE(S)	(4) SUBORD UNITS
1 BDE	_____	_____	_____	_____
			_____	_____
			_____	_____
			_____	_____
			_____	_____
				_____
				_____
				_____
				_____

MAOR UNIT	(1) MISSION	(2) SECTOR	(3) AVENUE(S)	(4) SUBORD UNITS
2 BDE				
3 BDE				
DIV TRP				
DIV ARTY				

EXHIBIT 7

INSTRUCTIONS:

1. On Response Sheet #2, write your recommended Div. Task organization. Indicate type of relationship to BDES, div. troop and divarty: (attached, DS, GS REINF, or GS).
2. On Response Sheet #3, write your recommended maneuver plan and mission directives to subordinate units.
3. Indicate on the 1:50,000 SITMAP overlay the location of the following:
   a. BDE lateral and rear boundaries
   b. BDE coordinating points
   c. Visualized FDA battalion location
   d. Reserve force location
   e. Visualized allowable enemy battalion penetrations, and
   f. Division directed blocking positions
4. You will have one hour to complete the above task, please contact your aide via the telephone (7R) at that time.

RESPONSE SHEET #2

EC-D3
20 Mech Div
West Germany
150200SEP74

TASK ORGANIZATION

List combat and combat support units in the specific task organization, which you want to recommend. Specify allocation of mech. bns, armd bns, artillery, air defense artillery, armd cav. squadron, and engineers. Cross-attach companies if you wish to.

1st Bde	2nd Bde

3d Bde

Div Troop	Div Arty

EXHIBIT 8

RESPONSE SHEET #3

EC-D3
150200SEP74

CONCEPT OF MANEUVER AND MISSIONS TO SUBORDINATE UNITS

Write out your recommended concept of the operation and your mission directives to 20 Mech Div subordinate units under Paragraph 3, below. Each subparagraph is preceded with a set of instructions. Please follow these instructions in completing your responses.

1. SITUATION

a. Enemy Forces. Annex A, Intelligence

b. Friendly Forces.

(1) 3d Corps defends immediately in sector with 57 Mech Div on the north, 20th Mech Div in the center, and 74th Mech Div on the south. 56th Armd Div and 26th (UK) Armd Div are Corps Reserve.

(2) Elements of 9th TAF support 3d Corps.

(3) 61st Arty Gp GSR 20th Mech Div.

2. MISSION

Division defends in sector immediately from (QA0086) to (QA0874); allows no penetration west of Hills 715 (PA8678), 794 (PA8873), and 726 (PA9066); and concurrently occupies general outpost.

3. EXECUTION

a. Concept of the Operation

The concept of operation is divided into two subparagraphs: one describing the scheme of maneuver and the second covering the plan of fire support.

The first subparagraph gives the concept of operation. This is a statement of the commander's

tactical plan, to include the scheme of maneuver and plan of fire support. It is informative rather than directive. It may also provide the commander's visualization of the conduct of the operation and a clarification of its purpose. Although brief, it is stated in sufficient detail to insure appropriate action by subordinates in the absence of additional specific instruction. If the operation is phases, each paragraph should reflect same. The scheme of maneuver covers employment of major maneuver units and is derived primarily from the commander's decision.

(1) Maneuver

The plan of fire support in the second subparagraph stems from the commander's decision and from staff planning. It includes whether a preparation is to be fired and, if so, its duration and priority of fires.

(2) Fires

In the next subparagraphs, give the specific task to be accomplished by each of the major elements of the command.

(3) 1 Bde:

(4) 2 Bde:

(5) 3 Bde:

(6) Artillery. The artillery subparagraph is divided into two parts: the first covers field artillery and the second covers air defense artillery. In listing

artillery, the organic and attached units are listed in numerical sequence (regimental numbers), beginning with the lowest numbered unit. As minimum, the artillery subparagraph includes the artillery organization for combat.

(a) FA:

(b) ADA:

(7) Other Combat Elements. Other elements providing combat support (e.g., armored carrier units or engineer units performing combat support engineer tasks, as

applicable). These elements are listed in alphabetical sequence by branch. Normal service missions are not included. It is not necessary to list all the units in the command, nor is it required to give instructions for the total employment of a particular unit. For example, instructions to an engineer unit concern only the combat support portion of the unit's mission.

(a) Engr:

(b) Reserve:

(8) Coordination Instructions. The last subparagraph of paragraph 3 is entitled "Coordinating Instructions" and contains details of coordination and control applicable to two or more elements of the command. Troop safety measures appropriate to the nuclear battlefield may be shown here. Restrictions on use of nuclear weapons may be included. Priorities and necessary coordination for use of the airspace above the battlefield are shown here.

EXHIBIT 9

DEFENSIVE SCENARIO

COMBAT SESSION BRIEFING

SITUATION

a. You are asked to continue in the role of G3 of the 20th Inf Div (Mech).

b. The Division Commander has considered all defensive planning recommendations. The resulting 20 Mech Div OPLAN 37 was approved by 3d Corps. Therefore, your assignment is to execute 20 Mech Div OPORD 37, a copy of which is attached.

c. All units have now moved to defensive positions, as portrayed on the operations Overlay for OPORD 37.

YOUR TASKS

In keeping with the mission of the 20th Div you are to do everything you can to delay the aggressor and to defend your sector.

You have already organized your forces and positioned them for the defense. When combat starts you will be advised every ten minutes of developments. You will be able to follow specific situations if you establish Standing Requests for Information (SRI). If some of your units are in trouble, you may wish to reinforce them by cross-attachments, at the company and battalion levels, by calling in tactical air strikes, or by requesting artillery support. You may also access the data base, as you did earlier, in order to extract particular items of information.

We realize that a Division G3 would not be expected to perform some of the tasks that we will ask you to do this afternoon. These tasks will include calling in artillery fires and air strikes to support your maneuver units, normally a fire support coordinator function. However, we need to know when such support would be given and how much support would realistically be given. Based on the responses given by persons such as yourself, we shall be able to program the computer to handle the fire support and tac air requirements in a realistic manner, so that future consultants can proceed with their normal decision making tasks.

PRECEDING PAGE BLANK

The computer will not "know" when and how to use the simulated fire power unless we tell it. We prefer that such judgements be based on data provided by experienced military officers such as yourself.

Your specific goals are to hold terrain, inflict maximum personnel and materiel losses on the enemy, and minimize such losses for your forces.

4. TASK ORGANIZATION AND MISSIONS

At the start of combat, all maneuver and support units will be organized and will receive initial mission directives in accordance with 20 Inf Div OPORD 37. Further commands to use these units or to specific artillery and air units will be initiated by you, using the CRT.

5. TIME

After you have been instructed in how to operate the CRT keyboard, the exercise will begin. The exercise start time/date will be 151240SEP. The start of the exercise will be signalled by the general index automatically appearing on your CRT.

This Exhibit is shown for example only. OPORD 37 will be a reflection of the completed G2/G3 tasks. It will be prepared in hard copy during the break between planning and combat phases.

EXHIBIT 10

(CLASSIFICATION)

(No change from verbal orders)

EC-D3
Copy 2 of 12 copies
20 MECH DIV
CULMITZ (011159) GERMANY
150300SEP74

OPORD 37

REFERENCE: A - Map, (Germany, 1:50,000, HOF - PLAUEN)

B - Map, (Central Germany, 1:250,000)

C - Overlay (20 Mech Div Area of Operations)

TASK ORGANIZATION

1st Bde	2d Bde
1-66 Mech	1-69 Mech
1-67 Mech	1-70 Mech
1-68 Mech	1-71 Mech
1-1 Armd	1-2 Armd
1-45 FA(DS)	1-46 FA(DS)
B/1-439 ADA	B/20 Engr(DS)
A/20 Engr(DS)	

3d Bde	DIV TRP
1-72 Mech	20 Engr (-)
1-3 Armor	20 AVN
1-21 Cav	20 SIG
1-47 FA Bn-Grp	20 MP Co
1-47 FA	
2-631 FA (155-SP)	
(remains attached)	
A/1-439	
C/20 Engr(DS)	DISCOM

(CLASSIFICATION)

DIVARTY

1-48 FA
1-49 FA
1-439 ADA (-)

20 Admin Co
20 Maint
20 Med
20 S&T

1. SITUATION

a. Enemy Forces

(1) The Aggressor 16 Combined Army is expected to attack through the Hof Gap with probable objective to secure the rail heads vic COBURG (PA4070).

(2) Concentrations of enemy forces suggest that main attack may occur in 20 Mech Div sector along Avenue of Approach (Alpha). See overlay.

(3) Secondary attacks can be expected along Avenues of Approach (Bravo), (Charlie), and (Delta). See overlay.

(4) Enemy units opposing 20 Mech Div are approximately 95 percent TO/E.

(5) Annex A (Intelligence).

b. Friendly Forces

(1) 3d (U.S.) Corps prepares to conduct mobile defense in sector NLT 150400SEP with 57 Mech Div in the north, 20 Mech Div in the center, and 74 Mech Div in the south. 56 Armd Div is Corps reserve with priority of employment to 74th Mech Div. 401st Arty Gp protects in priority Corps: FDA, Corps reserve, corps command post.

(2) 26 (UK) Armd Div supports 3d (US) Corps.

(3) Elements of 9th Tactical Air Force support 3d (US) Corps.

(4) 61st FA Grp GSR 20th Mech Div.

c. Attachments and Detachments. Task Organization

2. MISSION

20 Mech Div defends NLT 150400SEP from (120270) to (200120), retains Hills 715 (PA8678), 794 (PA8873) and 726 (PA9066) and delays Aggressor east of the Saale River (190180) FEBA for 24 hours.

3. EXECUTION

a. Concept of Operation (Annex B Operation overlays

(1) Maneuver. 20th Mech Div conducts area defense of the Saale River from (115275) to (200130). 1st Bde defends in the north. 2d Bde defends in the south. 3d Bde, div res, prepared to counterattack to restore the FDA, priority to sector of 1st Bde. 3d Bde establishes div GOP of two battalions to obtain 24-hour delay.

(2) Fires. Priority of artillery and close air support first to the GOP, to the 1st Bde upon withdrawal of the GOP, to the div res when committed.

b. 1st Bde:

(1) Defends in Sector

(2) Prepare in priority: blocking positions 1, 2, and 3.

c. 2nd Bde:

(1) Defends in Sector

(2) Prepares in priority: blocking positions 4, 5, 6.

d. 3d Bde:

(1) Establishes GOP immediately with two battallion-sized task force; delays enemy forward of FEBA for 24 hours.

e. ARTY:

(1) FA:

(a) 1-45 FA: DS 1st Bde

(b) 1-46 FA: DS 2d Bde

(c) 1-47 FA: Form 1-47 FA Bn-Gp; after group ceases GSR 1-46 FA; DS 3d Bde on committment

(d) 1-47 FA Bn-Gp:

1-47 FA
2-631 FA

Attached 3d Bde; attachment and Bn-Gp cease on withdrawal of GOP.

(e) 1-48 FA: GSR 1-47 FA Bn-Gp; on withdrawal GOP, GSR 1-45 FA

(f) 1-49 FA: GS

(g) 2-631 FA Atch 1-47 FA Bn-Gp; after group ceases GSR 1-46 FA

(2) ADA:

(a) 1-439 ADA (-): Protect in priority: division reserve, division command post, DISCOM

(b) A-439 ADA: atchd 3d Bde; on withdrawal of GOP; atchd 2d Bde

(c) B/1-439 ADA: atchd 1st Bde

(3) Annex C, Fire Support

f. 20 Mech Div Aviation: GS; support 3d Bde with A/20 Avn until withdrawal GOP

g. 20 Mech Div Engr: (-): GS; priority to the reserve. On withdrawal GOP, C/20 Engr: DS 3d Bde

(1) 20 Engr

(2) Annex D (Engineer)

h. Reserve: (-)

(1) Battalion Task Force of 3d Bde until withdrawal of GOP.

(2) 3d Bde after withdrawal through FEBA.

(3) Prepares to execute Div counterattacks, priority to 1st Bde sector.

(4) Prepare to release one company for rear area security.

i. Coordinating Instructions:

(1) Bdes in FDA support GOP withdrawal.

(2) 1st and 2d Bdes destroy Saale River Bridges in sector upon withdrawal of GOP.

(3) Priority of road movement to GOP force on withdrawal through sector.

4. SERVICE SUPPORT: ANNEX E

DISCOM operational in vicinity SCHWARZENBACK (PA8774) NLT 150100SEP.

5. COMMAND AND SIGNAL: ANNEX F

Div CP opens in vicinity of CULMITZ (011159) 150300 SEP.

ACKNOWLEDGE

Smith
MG

OFFICIAL:

Jones
G3

Annexes A - Intelligence (omitted)
B - Operation Overlays

EXHIBIT 11

EC-D3

TROOP LIST AND CODE INDEX

UNIT	CODE	WPN
1ST BDE		
1-66 Mech Bn	703	
A/1-66	704	
B/1-66	705	
C/1-66	706	
1-67 Mech Bn	712	
A/1-67	713	
B/1-67	714	
C/1-67	715	
1-68 Mech Bn	716	
A/1-68	717	
B/1-68	718	
C/1-68	719	
1-1 Armd Bn	707	
A/1-1	708	
B/1-1	709	
C/1-1	710	
1/45 Arty	747	155MM(SP)
A/1-45	748	155MM(SP)
B/1-45	749	155MM(SP)
C/1-45	750	155MM(SP)

UNIT	CODE	WPN
2D BDE		
1-69 Mech Bn	720	
A/1-69	721	
B/1-69	722	
C/1-69	723	
1-70 Mech Bn	733	
A/1-70	734	
B/1-70	735	
C/1-70	736	
1-71 Mech Bn	737	
A/1-71	738	
B/1-71	739	
C/1-71	740	
1/2 Armd Bn	724	
A/1-2	725	
B/1-2	726	
C/1-2	727	
1-46 Arty	751	155MM(SP)
A/1-46	752	155MM(SP)
B/1-46	753	155MM(SP)
C/1-46	754	155MM(SP)

UNIT	CODE	WPN
3D BDE		
1-72 Mech Bn	741	
A/1-72	742	
B/1-72	743	
C/1-72	744	
1/49 Arty	763	HJ MSL
A/1-49	764	HJ MSL
B/1-49	765	HJ MSL

TROOP LIST AND CODE INDEX

UNIT	CODE	WPN
GOP FORCE		
1-3 Armd Bn	728	
A/1-3	729	
B/1-3	730	
C/1-3	731	
1-47 Arty	755	155MM(SP)
A/1-47	756	155MM(SP)
B/1-47	757	155MM(SP)
C/1-47	758	155MM(SP)
2-631 Arty	766	155MM(SP)
A/2-631	767	155MM(SP)
B/2-631	768	155MM(SP)
C/2-631	769	155MM(SP)
1-48 Arty	759	8 inch
A/1-48	760	8 inch
B/1-48	761	8 inch
C/1-48	762	8 inch
1/21 ACS	795	
A/1-21	796	
B/1-21	797	
C/1-21	798	
C/1-21	799	

UNIT	CODE	WPN
DIVARTY		
1-439 Arty	800	C/V
A/1-439	801	VULCAN
B/1-439	802	VULCAN
C/1-439	803	CHAPARRAL
D/1-439	804	CHAPARRAL
61 ARTY GROUP		
1-61 Arty	811	HJ MSL
A/1-61	812	HJ MSL
B/1-61	813	HJ MSL
2/61 Arty	714	155MM(SP)
A/2-61	715	155MM(SP)
B/2-61	716	155MM(SP)
C/2-61	717	155MM(SP)
3/61 Arty	818	155MM(SP)
A/3-61	819	155MM(SP)
B/3-61	820	155MM(SP)
C/3-61	821	155MM(SP)
4/61 Arty	822	8 inch
A/4-61	823	8 inch
B/4-61	824	8 inch
C/4-61	825	8 inch
5-61 Arty	826	8 inch
A/5-61	827	8 inch
B/5-61	828	8 inch
C/5-61	829	8 inch

UNIT	CODE
54 ENGR	
1-54 Engr Bn	831
A/1-54	832
B/1-54	833
C/1-54	834
D/1-54	835
HQ	
20 Engr Bn	778
A/20	779
B/20	780
C/20	781
D/20	782
E/20	783
129 AVN	849
Aslt Co.	850
Gen Spt Co.	851
TAC AIR SQDN 15	852
Flt A	853
Flt B	854
Flt C	855

EXHIBIT 13

DECISION AIDED SIMTOS

Thank you for your participation as a consultant in this effort to develop automated decision support systems for Army Officers. We know that it has been a strenuous day, but we would appreciate a few more minutes of your time. Your answer to the following questions can help us refine our research and fulfill our objective of producing military information systems that are responsive to your needs. This information, as well as the rest of today's materials, is confidential.

Personal Data

Name _____ Present Rank _____

Age _____ Years of Active Military Service _____

Present Position _____

Military Experience

1. Please summarize your military experience in chronological order in the spaces provided. Please summarize any previous G3 experience.

YEAR	UNIT (Co. Bn. Div.)	TYPE (Inf. Mech. Armd)	POSITION HELD (CO.G-3, etc)	DURATION (Months)	LOCATION (Country)	COMBAT (Months)

2. If you have ever participated in ATT, CPX, FTX or Map exercises in West Germany, please fill in the following blanks. If you have never participated in these activities, continue to the next question.

YEAR	UNIT (Co., Bn., Div.)	POSITION (Cmdr. X-O, Etc.)	Type and Number of Exercises

Education

3. Please indicate (✓) whether you have attended any of the following Army Schools. If you have, please fill in the supplementary blanks.

a) U.S. Army Command and General Staff College

Year Graduated _____

b) National War College (Ft. McNair)

Year Graduated _____

c) Army War College (Carlisle Barracks)

Year Graduated _____

4. Please circle highest year completed:

College 1 2 3 4 Degree _____ Field _____

Graduate 1 2 3 4 5 Degree _____ Field _____

Review of SIMTOS

Please ✓ your response.

5. Were you satisfied with the way you were contacted to participate as a consultant? YES NO

6. Although SIMTOS is not an operational tactical informational system, the knowledge being gained from its study will serve as the background for the development of future decision support systems.

With the design of these future systems in mind, how would you rate SIMTOS (as you used it today) performance, i.e., how well did it help you accomplish your mission?

Fair 1 2 3 4 5 Excellent

Would you agree or disagree with the following statement: Military information systems must be responsive to the information requirements and "command cycle" of the user.

Agree Disagree

7. In which of the following functions would you prefer to use an automated system instead of a staff officer (please check ✔).

Intelligence Gathering
Troop Organization
Logistical Planning
Contingency Planning
Implementation of Orders
Communications
Other

Thank you again for participating in the evaluation of decision aided SIMTOS. We would welcome any further comments on these efforts.