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Desert Storm Challenges: An Overview of Desert Storm Survey Responses

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U.S. Army Research Institute

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13. ABSTRACT *(Maximum 200 words)*

This report provides an overview of data collected from participants in Operation Desert Shield and Operation Desert Storm (ODS). In January 1991, the Center for Army Lessons Learned (CALL) requested the assistance of the U.S. Army Research Institute for the Behavioral and Social Sciences (ARI) in surveying personnel in ODS. Questionnaires were developed and distributed to virtually all commands involved in ODS. A total of 2,463 usable survey forms were returned to ARI. Respondents included 6 General Officers, 34 Colonels, 170 Lieutenant Colonels, and 111 Sergeants Major, and personnel from 12 divisions or separate brigades and from 62 corps or echelon-above-corps elements. The concept of the commander's intent was strongly endorsed and the value of rehearsals was emphasized by many of our respondents. Supply and distribution systems, personnel evacuation and reporting systems, communications, and intelligence flow were frequently mentioned as problem areas. More detailed analyses will be required before conclusions or lessons learned may be derived from this data.

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Human Factors in Training
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FOREWORD

The Fort Leavenworth Field Unit of the U.S. Army Research Institute for the Behavioral and Social Sciences (ARI) supports the Combined Arms Command by conducting research on human performance issues in command and control. In January 1991, the Center for Army Lessons Learned (CALL) requested the Field Unit's assistance in surveying key personnel in Operation Desert Shield and Operation Desert Storm (ODS). Working closely with CALL personnel, the Field Unit developed and distributed questionnaires to virtually all commands involved in ODS. Roughly 2,500 questionnaires were completed and returned to the Field Unit over the next 3 months. Field Unit personnel developed a data base system for storing and analyzing the information and entered the material from the questionnaires into the data base. There are a number of potential lessons to be learned from the survey data; this report provides an overview of the data available so that interested parties can be made aware of the existence and potential utility of this data.

This research was conducted as technical advisory service and funded under the task entitled Enhancing Command Staff Performance in Combat Operations. On 12 July 1991, preliminary information and analyses were sent to the CALL element preparing the official Army ODS Lessons Learned report. Additional analyses of opinions relating to intelligence procedures and products were provided to CALL on 26 September 1991. Information derived from the survey data has also been provided to the Communications Center and School. A draft of this report was provided to the Director, CALL, for his review in September 1992.

EDGAR M. JOHNSON
Acting Director

DESERT STORM CHALLENGES: AN OVERVIEW OF DESERT STORM SURVEY RESPONSES

EXECUTIVE SUMMARY

Requirement:

The Director of the Center for Army Lessons Learned (CALL) requested that the Fort Leavenworth Field Unit of the U.S. Army Research Institute for the Behavioral and Social Sciences (ARI) assist him in gathering data from participants in Operation Desert Shield and Operation Desert Storm (ODS). The intent was to supplement planned interviews with senior personnel with a broad-based data collection effort addressing the experience and opinions of commanders and staff in all types of units at every echelon.

Procedure:

Members of the Field Unit staff developed a preliminary list of key issues to be addressed in the ODS survey; these issues were derived from Training and Doctrine Command Center and School responses to a CALL message and from staff experience in observing and evaluating command and control processes. The draft issues were reviewed and revised by the Director, CALL, and his staff. Based on the revised issue list, the Field Unit staff went through three drafts of a survey targeted for combat and combat support commanders, with CALL comments and revisions playing a key role in the revisions from one draft to the next. Once all were in agreement on the format and content of the first questionnaire, two additional questionnaires were prepared. They were derived from the first but focused on issues expected to be more relevant to combat service support commanders or to staff personnel in a variety of units. The survey forms were reproduced and transported to Saudi Arabia in March 1991 by CALL and ARI military personnel. All units that had not redeployed were visited, the purpose of the survey was explained, and a proposed distribution list and sufficient copies of the surveys were left with the units. Subsequent visits were made in the continental United States to units that had redeployed earlier. The completed surveys were returned to the Field Unit by mail and the information was entered into a computer data base designed for this data.

Findings:

A total of 2,463 usable survey forms were returned to ARI. Respondents included 6 General Officers, 34 Colonels, 170 Lieutenant Colonels, and 11 Sergeants Major. Respondents also included personnel from 12 divisions or separate brigades and from 62 corps or echelon-above-corps elements. Respondents' branch, previous combat experience, experience at Combat Training Centers (CTCs), and assignments during ODS represent a similar diversity. There were several issues that received many comments. The concept of the commander's intent was strongly endorsed and the value of rehearsals was emphasized by many of our respondents. Supply and distribution systems, personnel evacuation and reporting systems, communications, and intelligence flow were frequently mentioned as problem areas.

Utilization of Findings:

Preliminary information and analyses were sent to the CALL element preparing the official Army ODS Lessons Learned report. Additional analyses of opinions relating to intelligence procedures and products were provided to CALL in September 1991. Information derived from the survey data has also been provided to the Communications Center and School. Additional detailed analyses on specific topics are planned within ARI, but the complete utilization of the data described in this report will require the participation of a broader range of military analysts. Qualified personnel may obtain this data, including relevant portions of the transcribed material, from the ARI data base by submitting a request through the Director, Center for Army Lessons Learned, Fort Leavenworth, Kansas 66027.

DESERT STORM CHALLENGES: AN OVERVIEW OF DESERT STORM SURVEY RESPONSES

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DESERT STORM CHALLENGES:
An Overview of Desert Storm Survey Responses

1. INTRODUCTION

This report provides an overview of data obtained through surveys that were developed by the Center for Army Lessons Learned (CALL) and the U.S. Army Research Institute Field Unit at Fort Leavenworth (ARI) to investigate a range of command and control (C2) issues. This overview includes (a) a description of the data collected; (b) tabulations of responses to questions formatted with "Yes - No" or a Rating response; and (c) descriptions of, and examples of, responses on many of the "fill in the blank" questions. This report does not provide "lessons learned" during Desert Storm; rather it provides a description of data available from which lessons learned may be derived. Additional reports containing more detailed descriptions and analyses are in preparation; these follow-on reports will focus on topics of Training, Leadership, and other issues.

Background

ARI and CALL jointly developed three questionnaires for distribution to personnel in Desert Storm units. One form of the questionnaire was designed for commanders of Combat and Combat Support units (Appendix A), a second was designed for commanders of Combat Service Support units (Appendix B), and a third was designed for Staff Personnel (Appendix C). For convenience, the three versions will be referred to in this report as Combat Commander, CSS Commander, and Staff, respectively. The three versions of the questionnaire were intended to survey opinions from a broad range of Army personnel on a variety of command and control issues. We first developed a questionnaire addressing issues that were expected to be of concern to combat and combat support commanders. The Combat Commander survey form was then modified through deletion and addition of items to develop questionnaires that would examine related issues within the purview of CSS Commanders and of staff personnel in all units. CALL had requested that TRADOC Centers and Schools identify issues and concerns that would be appropriate to examine in the context of Desert Shield and Desert Storm; over 2,000 issues and concerns were identified. We were guided by those responses, but in order to develop a survey instrument of manageable length we focused primarily on issues related to tactical command and control.

ARI and CALL personnel distributed over 5,000 of the surveys in Saudi Arabia in April, 1991, and continued the distribution of the surveys to units in CONUS through July, 1991; it is estimated that a total of 10,000 surveys were distributed in all. The summaries and analyses reported in this report are based on all the surveys that were returned (2463).

The survey respondents include 1864 officers (52% captains, 21% majors), 478 NCOs (including 111 Sergeants Major) and 58 warrant officers. The majority of the respondents (55%) were from division or lower echelon units, with the remainder at corps or echelons above corps (EAC); the corps and EAC personnel include personnel from signal, field artillery (FA), air defense (ADA), transportation, engineering, personnel, medical, and other units who may in fact have been attached to or in direct support to lower echelon combat units. Thus, for example, a respondent who identified himself as a company commander within a transportation group is included in our count of EAC personnel though his unit may well have been attached to or in direct support to a division or maneuver brigade. Twelve divisions or separate brigades are represented by the respondents at division or lower, and 62 different corps and EAC elements are represented.

Limitations

It is important to recognize the following factors in interpreting the data presented in this report.

- All responses are given equal weight, whatever the respondent's rank, duty position, and unit's actual experience. There is a danger that some of the opinions are in fact uninformed and based on hearsay rather than personal experience. We have tried to counterbalance this possibility by examining the detailed distributions of responses and reporting apparent trends where relevant. We also identify each respondent's reported "rank" and "duty position" when providing verbatim comments except in those cases where such information would provide a strong clue as to the identity of the respondent. In our follow-on reports on specific topics we will report more detailed distributions of responses by rank, duty position, branch, and/or other relevant factors where appropriate.
- The survey forms were distributed top-down through unit distribution channels. Many respondents received and filled out the wrong form of the questionnaire. A number of Combat Commanders filled out the Staff version of the questionnaire, and vice versa. One brigade commander returned both a Combat Commander survey and a Staff survey. Again, the individual verbatim comments can be put into perspective by looking at the associated rank and duty position, but any summaries for Combat Commander and/or CSS Commander include some staff personnel opinions in the totals, and summaries for Staff include some commander opinions in the totals.
- There is considerable overlap in the questions used in the three forms of the survey; thus, in many cases we have parallel data from all three groups of respondents. However, in most cases we have not attempted to compare and contrast in any great detail, for example, the responses of Staff vs. Combat Commanders or Combat Commanders vs. CSS Commanders. We have not attempted to differentiate among personnel in Light vs. Heavy units, G-2 staff vs. G-4 staff, brigade vs. EAC staff, etc. Nor have we attempted to match opinions and perceptions with a unit's actual battle experience in SWA. As mentioned above, reporting of such detailed analyses is deferred to follow-on reports on specific topics.

- We received relatively few of the CSS Commander surveys (132 vs. 415 Combat Commander surveys and 1916 Staff surveys.) A fair portion of the Staff surveys, however, were filled out and returned by staff personnel assigned to CSS units.

Despite these limitations, we believe that the data presented here does provide an accurate reflection of the opinions of the majority of Desert Storm personnel. A preliminary summary of survey responses was provided to CALL in July of 1991, based on the surveys which had been entered into our database at that time. The patterns of responses from those 786 surveys (roughly 30% of the total number eventually processed) and the issues raised in narrative comments closely match the data presented in this report based on the total returns. We are confident that we would find little that was new or different if we had been able to obtain responses from every commander and all staff personnel involved in Desert Storm. From their marginal notes, we know that this questionnaire was frustrating for many respondents; some items were so general as to be ambiguous, and the respondents had a great deal to offer on topics we had not addressed. Despite such frustrations, the pressures of redeployment, the desire to become re-acquainted with family, and other factors, there were well over 500 commanders, from platoon through division, and well over 1900 staff personnel who took the time to reflect on their experience and provide us their opinions, insights, and recommendations. From this large number of responses, there are many instances where a consensus is clear, but there are also many where strong differences of opinion may never be reconciled due to the inherent limitations of the surveys.

Report Contents

Section 2 of this report contains a description of the personnel-background information obtained from respondents, and Section 3 contains tabulations and descriptions of respondents' reactions to the major issues addressed in the surveys. No attempt is made here to provide an in-depth analysis of the meaning of these responses; the intent is to describe the data that is available for analysis. Follow-on reports will examine specific issues in more detail; for example, the first follow-on will examine the role of the Combat Training Centers (CTCs) in preparing units for combat, and the second will examine Leadership issues.

In the case of questions which called for a rating, ranking, or "Yes-No" type of response, we provide a table summarizing the responses; we have also included comments about the pattern of responses, the relationship of some of the responses to other questions, etc. Some "rating" type questions provided the opportunity for respondents to add additional comments; we have examined those comments, and provide a summary with the basic table. In all cases we have noted the number of people responding to a particular item; in some cases only 100-200 have responded, and in other cases virtually everyone in our sample responded. Note that "percentage":

figures are used to describe responses in many cases; for example "15% of respondents identified weather as a factor limiting movement in deep operations." Unless otherwise noted, these are percentages of the number of people responding to the particular item, not percentages of the total 2463 who returned the questionnaire.

In the case of the questions which called for a "fill-in-the-blank" type of response (where the "blank" was often several lines long) we have summarized those comments and/or provided a sample of the comments. Note that the verbatim comments must be taken in context. There are many cases where the overwhelming majority of respondents gave very high ratings to a particular aspect of Army operations during Desert Storm, and yet the sample of related comments includes many negative comments. These comments which are negative in tone should not be ignored just because they do not reflect the majority opinion, nor should they be misinterpreted as somehow providing a "truer picture" than the ratings themselves. Rather, the verbatim comments should be seen as candid reflections by professional soldiers who are concerned about some aspect of their job. If we are to learn from our experience, we must be open to examining what went wrong as well as what went right. Ideally we would include all comments made hereby giving the reader a more complete picture of the range of responses. However, it is impractical to reproduce and distribute all verbatim comments recorded; we estimate that such a compendium would be well over 1000 pages in length. Qualified personnel may obtain relevant portions of the transcribed material from the ARI database by submitting a request through the Director, Center for Army Lessons Learned, Fort Leavenworth, Kansas, 66027.

2. RESPONDENT PROFILE

The 2463 persons who completed and returned one of the questionnaires represent a broad and varied sample of Army personnel. This section of the report provides demographic profiles on these personnel as derived from their questionnaires.

The cover sheet on each questionnaire was identical (see Appendices) and included spaces for respondents to identify themselves and describe their background. Table 1 shows the number of officers and enlisted personnel who filled out each survey form. The largest single group of respondents are Captains who returned the Staff survey.

Table 1

Rank profile of respondents to the three surveys

	Survey Form Completed		
RANK	Combat Commander	CSS Commander	Staff Personnel
Major General (MG)	2		
Brigadier General (BG)	1	2	1
Colonel (COL)	10	5	19
Lieutenant Colonel (LTC)	63	14	93
Major (MAJ)	23	21	354
Captain (CPT)	268	61	643
1st Lieutenant (1ST LT)	19	9	196
2nd Lieutenant (2ND LT)	7	1	51
Warrant Officer (WARRANT)	3	2	53
Sergeant Major (SGM)	4	3	104
Master Sergeant (MSG)	5	4	84
Sergeant First Class (SFC)	2	2	172
Staff Sergeant (SSG)	3	3	66
Sergeant (SGT)	1	1	24
Other Enlisted (ENL)			4
Unknown (UNK)	4	4	52
Total number responding	415	132	1916

Most respondents (2399) did identify their duty position, but it was not possible in all cases for us to interpret what they had told us. Table 2 shows, by "command position", the number of respondents returning each of the three versions of the survey who we could clearly identify as holding such a position. We included under "command position" not only Commanders, but also Command Sergeant Major and Executive Officer (XO). There were additional respondents, not shown in Table 2, who listed their duty position as "Commander" but who did not give us sufficient information for us to be able to tell of what they might be in command.

Table 2

Command-position profile of respondents to the three surveys

Command Position	Survey Form Completed		
	Combat Commander	CSS Commander	Staff Personnel
Division Cmdr	2		
Assistant Division Cmdr	1	2	1
Brigade/Group Cmdr	11	4	5
Battalion/TF/Squadron Cmdr	58	13	16
Company/Battery/Troop Cmdr	217	49	82
HHC/HHT/HHD Commander	20	3	4
Command Sergeant Major	4	2	70
Brigade/Group XO	2		12
Battalion/TF/Squadron XO	8	3	71
Total number	323	76	261

In addition to position, we also had intended to ask respondents to identify the unit with which they were serving. In the final editing of the form this item was "simplified" to conserve space; as a result we obtained, at best, an indication of each respondent's division-or-higher unit affiliation. We were able to deduce unit affiliations in many cases by assuming, for example, that all responses in a given return envelope in fact came from individuals in the same unit. In general, however, we cannot identify the specific company, battalion or brigade-level unit affiliation of a respondent.

Most respondents indicated the length of time they had served in their position (2356 responses) and with their current unit (2367 responses). These times ranged from 1 day to five years in the same position, from 1 day to 17 years with the same active-component unit, and from 3 months to 24.5 years with the same reserve component unit. Our respondents arrived in the theater of operations as early as August, 1990 through to as late as January, 1991.

Asked to indicate their experience at the four Combat Training Centers, 1318 responded. Of the total 2463 respondents, 43% reported at least one rotation at the National Training Center (NTC), 36% reported at least one rotation at the Joint Readiness Training Center (JRTC), 39% reported at least one rotation at the Combat Maneuver Training Center (CMTC), and 39% reported at least one Battle Command Training Program (BCTP) rotation. Of the 400 who reported previous combat experience, 226 reported one or more tours in Vietnam, 47 reported experience in Grenada, 117 reported experience in Panama, and 20 reported "Other" combat experience including Lebanon and the Korean DMZ.

The final question in the personal-background portion of the surveys asked respondents to indicate their Desert Storm experience by checking one of three responses: a) my unit actively fought; b) my unit was under indirect

fire but did not actively fight; or c) my unit did not receive fire. We had intended for this item to provide us with an indicator of the respondent's direct involvement in the ground war; however, it is apparent from the responses obtained and from the marginal notes that most respondents found this question very ambiguous. Therefore, we have chosen not to incorporate this information into any of the descriptions or analyses of the data. At some point it may be desirable for researchers to compare the perceptions and opinions of those who were "on the front lines" vs. those in a staff or supporting role near the battle vs. those who were further to the rear. Any such analysis will need to be based on an examination of individual unit histories rather than the responses to this question.

3. FINDINGS

Effectiveness of Various Factors

As shown in Table 3, Combat Commanders rated the effectiveness of various general factors, such as logistics, as they related to their operations. Note that the items are not shown here in the same order as in the original survey, but rather have been ordered in terms of their rated effectiveness. Of the 10 factors listed, all were seen as effective (higher than 4.0 on the seven-point scale) with the exception of the use of FASCAM.

Table 3

Rated effectiveness of general combat capabilities

Combat Factor [a]	Average Rating	Number of Responses
Other?	6.1	21
Reconnaissance	5.4	334
Friendly indirect fire support	5.2	263
Friendly deception operations	5.2	251
Deep ops, interdiction of 2nd enemy echelon	5.2	189
Close Air Support	5.1	233
Deep ops, interdiction of enemy reserves	5.0	178
Suppression of enemy air defense	4.9	192
Logistics	4.7	377
Counter reconnaissance	4.3	217
FASCAM in flank support	2.5	102

Note. A rating of 1 = "Low Effectiveness", 7 = "High Effectiveness"

[a] See Appendix A, page A-4 for the format of these questions as presented to the respondents.

We took a closer look at the 102 respondents who rated the effectiveness of "FASCAM in flank support." Six respondents gave a rating of 7; these included a battalion XO and two company commanders. Eight respondents gave a rating of 6; these included a battalion S-3 and five company commanders. Five gave a rating of 5; these included three company commanders and a Major who identified his duty position as Commander but who did not identify his unit or the unit type. Nine respondents gave a rating of 4, the midpoint on the seven-point scale of effectiveness. These respondents included a battalion commander and six company or troop commanders. Eleven gave a rating of three; these included three battalion commanders and six company commanders. Nine gave a rating of 2; these included one division ADC-S, a brigade commander, a battalion commander, and four company or battery commanders. The majority of the 54 persons responding to this item gave a rating of 1. These included a division commander, two brigade commanders, 15 battalion or squadron commanders, and 26 company commanders. It is not clear whether these very low ratings were due to the special circumstances of Desert Storm (rapid advance, difficulties encountered by combat support units in

maintaining the speed of advance, fighting in a desert environment with few choke points, etc.) or in fact are due to real difficulties encountered in the effective use of FASCAM. It is clear that commanders at higher echelons were more inclined to give this element a low rating.

We also took a closer look at the 21 responses that yielded a high average rating for "Other" factors. The brigade commanders identifying Other Factors gave high ratings to B-52s, OH-58Ds, and "Rehearsals from Bde to Plt." One battalion commander gave command and control a rating of 5 and a second gave DISCOM a rating of 1. Company commanders volunteering Other factors mentioned and gave high ratings to counter-mortar radar, attack helicopter support, navigational aids (LORAN/GPS), and PSYOPS leaflets.

All respondents were also asked to rate the effectiveness of leadership, personnel evacuation, etc. (see Table 4). Again, the survey items are presented in the table in the order of the average rating rather than in the order presented in the questionnaire. All elements were rated positively, with particularly high marks going to officer and NCO leadership.

Table 4

Related effectiveness of leadership and other factors

Factor [a]	Average Rating	Number of Responses
Officer leadership	5.7	2297
NCO leadership	5.5	2304
Handling of EPWs and refugees	5.1	1413
Personnel evacuation procedures	4.9	1420
Reserve component units	4.6	1323
Personnel replacement operations	4.5	1509

Note. A rating of 1 = "Low Effectiveness", 7 = "High Effectiveness"

[a] See Appendices, pages A-11, B-10 and C-8 for the format of these questions as presented to the respondents.

Disruptive Factors

Combat Commander and Staff respondents were asked to rate eight factors, shown in Table 5, with respect to "how disruptive was each...." The respondents rated a few factors as somewhat disruptive of operations: Chemical Threat, Unit and Staff Sleep Loss, and CP Displacement. However, none of these factors are above the mid-point on the seven-point response scale. Over 200 respondents identified "Other" factors; these issues were seen as more disruptive. A sample of these comments is presented in Table 6, along with the respondents' rank, duty position, and rating of the degree of "disruption"; note that in some cases we have paraphrased the original comment to condense the comment or remove profanity.

Table 5

Ratings of factors that disrupted operations

Disruptive Factor [a]	Average Rating	Number of Responses
Other?	5.0	203
Chemical threat	3.6	2124
Staff sleep loss and fatigue	3.5	2107
Unit sleep loss and fatigue	3.3	2093
Command Post displacement	2.8	1902
Enemy indirect fire	2.3	1782
Enemy direct fire	1.9	1686
Enemy maneuvering on the battlefield	1.7	1648
Enemy deception operations	1.5	1700

Note. A rating of 1 = "Low Disruption", 7 = "High Disruption"

[a] See Appendices, pages A-4, B-4 and C-4 for the format of these questions as presented to the respondents.

Table 6

Selected comments on other disruptive factors[a]

Rank	Duty Position	Rating	Comment
COL	Bde Cdr	7	Lack of log support
COL	Bde Cdr	7	Class IX repair parts
COL	Bde Cdr	7	Communications
COL	Bde Cdr	5	Long logistic LOCs
LTC	G-3	7	Wrong vehicles for desert warfare; e.g., 5-ton Expandos for staffs.
LTC	BN Cdr	7	[Poor] log support, Class IX in particular
LTC	BDE XO	7	Bn Cdr's poor leadership
LTC	S-3	7	Communications stretch & coverage to higher HQ
LTC	BN Cdr	5	Terrain management, narrow boundaries
LTC	CHEM Officer	5	Loss/lack of communications
MAJ	BN XO	7	Lack of repair parts
MAJ	S-2/S-3	7	Lack of spare parts
MAJ	Planner	7	Constant change to plans EAC level
MAJ	S-3	7	CSS personnel shortfalls
MAJ	G-2 Plans	7	Influx of personnel to unit 2 weeks before combat ops
MAJ	BN XO	7	Unnecessary congestion on the MSR
MAJ	G-3 Plans	7	Absence of warning orders from Corps
MAJ	DEP G-3	6	Lack of long range commo
MAJ	S-3	6	Lack of information
MAJ	BN XO	6	Late and fluctuating command guidance
MAJ	S-3	5	Sand storms; Log and CS vehicles clogging MSR

(continued on next page)

Table 6

Selected comments on other disruptive factors[a] (continued)

Rank	Duty Position	Rating	Comment
MAJ	S-3	5	Commander sleep loss
CPT	CO Cdr	7	Equipment failure
CPT	CE Staff Officer	7	Idiots on staff
CPT	CO Cdr	7	Fear of the unknown
CPT	Troop Cdr	6	Minefields
CPT	CO Cdr	6	Changing Rules of Engagement
CPT	CO Cdr	6	Flank coordination with sister-service unit
CPT	BN XO	6	Living conditions
CPT	CO Cdr	5	Lack of Intel
CPT	CO Cdr	5	EPW handling
CPT	CO Cdr	5	Effects of environment on equipment and personnel; Class IX was slow.
CPT	CO Cdr	5	Soldier load
1LT	BDE LNO	7	Lack of commo with own Bde
1LT	BN S-4	7	Lack of supplies, Class I-IX
1LT	BN S-4	5	CSS operator sleep loss and fatigue
2LT	BN CHEMO	6	Boredom
Warrant	OPS Officer	7	Environmental effects on equipment
SGM	BDE CSM	7	Obstacles/mines
SGM	CSM	5	Shortage of food and water

Note. A rating of 1 = "Low Disruption", 7 = "High Disruption"

[a] See Appendices, pages A-4, B-4 and C-4 for the format of this question as presented to the respondents.

Task Difficulty

Combat Commanders were asked to compare the relative difficulty of 10 different tasks; see Table 7 for the profiles of the rank orderings, ordered from the most difficult to the least difficult tasks based on the averages of all who responded. Note that because of the much larger number of company and field grade respondents, the average rankings strongly reflect the responses from these two groups. There are some variations among commanders at different echelons, but few major surprises. High on everyone's list of difficult tasks were "dealing with uncertainty" and "synchronizing the operation." General officers and field grade officers were concerned about "integrating staff operations". Deciding a course of action, communicating concepts to subordinates, and monitoring the execution of the battle were seen by all as lower in difficulty.

Table 7

Rank-ordering of task difficulty

TASK [a]	Average ranking of Difficulty	COL, BG, MG	MAJ, LTC	2LT, 1LT, CPT	NCO
Dealing with uncertainty	3.9	4.3	3.9	3.3	3.5
Synchronizing the operation	4.6	2.8	4.5	4.5	4.7
Integrating staff operations	5.3	4.2	5.1	4.9	4.8
Allocating own time and concentration	5.3	6.2	5.2	5.2	4.0
Visualizing the battlefield	5.3	4.7	5.2	5.0	4.9
Completing tasks within the alloited time	5.6	5.3	5.8	5.4	5.6
Meeting higher's requirements	5.6	4.9	5.8	5.5	5.2
Monitoring the execution	5.8	6.2	5.7	5.7	5.9
Communicating concepts to subordinates	6.6	5.2	6.2	6.7	5.3
Deciding a course of action	6.8	5.0	7.3	6.5	6.2
Total number responding	428	19	100	291	18

Note. The tasks which were perceived as more difficult have a low average ranking; easier tasks have a high average ranking.

[a] See Appendix A, page A-8 for the format of this question as presented to the respondents.

Commander's Intent

All respondents were asked: "What was the usefulness and application of higher commander's intent in your planning, preparation and execution?" Over 1500 responded to this question.

Most respondents were positive about the importance of understanding the commander's intent. Because of the fast pace and depth of the battlefield, units typically operated from FRAGOs and their knowledge of the commander's intent rather than from detailed OPORDs. This mode of operation was imposed in part by the communications difficulties discussed below.

Despite the overall positive tone of responses on this item, there was considerable variation within units and across units. For example, one senior officer found that:

> In planning and preparation it [commander's intent] was the most important element, also the most difficult to nail down. In trying to develop a detailed plan, wargame and rehearse it, the [higher headquarter's] cmdr's intent was vague and subject to misinterpretation by his staff and subordinate cmdrs. There was a need for closer dialogue.

Table 8 below lists additional, somewhat more typical, comments on this topic. Note that the first five comments all were made by officers from within the same division as the senior officer quoted above.

Table 8

Comments on "Commander's Intent"[a]

Absolutely imperative.	Div G-3
Excellent, kept our focus when the advance into Iraq turned into an exploitation.	Bn Cdr
Enabled my unit to plan and react in positive manner to rapidly changing scheme of maneuver.	CO Cdr
Effectively defined for me my mission and allowed me maximum flexibility in execution.	CO Cdr
Commander's intent is useful for elaborating how the mission should be accomplished. 70% of the time one reads boilerplate like, "strike rapidly" and "minimize casualties" but the remaining 30% can be useful. It is amusing to see the first person voice written by staff officers who write the commander's intent without his guidance.	Bn XO
CG's intent was articulated well and understood by all. In the absence of graphics & written orders, crosstalk between Bde Cdrs and Bn Cdrs and FM commo with ADC & CG allowed Div to move rapidly and accomplish mission.	Bde Cdr
Cdr's intent is the single most important aspect of the OPORD/FRAGO! At CMTC, NTC and in combat, when things get confused, disorganized and comms fail, all leaders know what to do and what the first result should be.	Bde Cdr
Absolutely essential	Div G-2
It was critical. We often lost commo with division and had to continue mission on Cdr's intent.	Bn Cdr
Very useful - provided guideline to execute w/o direct supervision.	CO Cdr
It was the thing that was the most important part of the order. Most useful in the execution phase. Must be known at least two levels down.	CO Cdr
Very useful. Due to the fast pace, fluidity and depth of the battlefield, direct communication was often not possible. We knew what our higher wanted us to do and did not need direct orders to maintain momentum.	Troop Cdr
Extremely critical. If you know Cdr's intent it gives you flexibility to act to meet his intent.	CO Cdr
[a] See Appendices, pages A-4, B-4 and C-4 for the format of this question as presented to the respondents.	

There were occasional negative comments about the doctrinal concept of "commander's intent", about the process which leads to the statement of intent, or about a particular individual's inability to articulate his intent, but these are heavily outweighed by the many responses which endorsed the concept and/or its implementation in Desert Storm. We will examine the positive and negative comments in more detail in the planned follow-up report focusing on leadership issues; in particular the responses need to be examined for any differences as a function of echelon or type of unit. However, even without additional detailed analysis, it is clear that the importance of this element of C2 has been validated.

Planning Process and Products

Both Commanders and Staff Personnel were asked whether they felt that the current estimate process was adequate[1]: 1667 responded and 1396 (84%) said "Yes." A follow-up question asked what techniques were used to abbreviate the estimate process; 412 provided comments including 278 who had answered "yes", 114 who had answered "no" and 19 who had not answered the previous question. Table 9 below provides a sample of typical responses to this question. Many respondents (104, 25% of those providing comments) either gave overly cryptic comments or seemed to be answering some other question; we roughly divided the remaining 308 comments into response categories. Many respondents (132, 32% of the 412 who responded) provided some details on how the process had been abbreviated including 103 who had said that the current estimate process is adequate, 24 who had said it is not, and 5 who had not answered the previous question. A substantial number of these respondents commented or implied that the lack of tactical intelligence data in itself led to an abbreviated process.

Table 9

Comments on techniques used to abbreviate the estimate process[a]

The enemy situation was so fluid or unknown that we simply left intelligence estimates fixed and used the remainder of the process.	CPT, Asst S-3
Cut pretty much to stated/implied tasks and METT-T.	CPT, Co Cdr
When time was short the S-3 limited the options for wargaming thus reducing time to wargame.	MAJ, Bn XO
We "short-cut" the IPB process - eliminated "event templating" which consumed too much time. Employed a very, very basic DST/execution matrix to support our recon/attack mission.	WO, Regiment S-2
Constant use and update of msn analysis in lieu of detailed updates to staff estimates	LTC, Bn Cdr
Intelligence info was not a factor in our planning process.	LTC, Bn Cdr
We did what always is done but gets a no go at the NTC: the commander and S-3, assisted by the S2 and FSO on the fringe, built a plan and execution matrix as quickly as we could. There was only one course of action wargamed based on the Cdr and S3 having to work without an accurate Intel picture and no fire plan from above. We established our scheme of maneuver based on 2 days experience with the enemy and our knowledge of our own strengths and weakness and used our most flexible formation that we had trained on extensively.	LTC, Bn Cdr
Only used what had changed from last order to publish current order. Did not repeat items that were the same.	COL, Bde Cdr
[a] See Appendices, pages A-5, B-5, and C-4, for the format of this question as presented to the respondents.	

[1] See Appendices, pages A-5, B-5, and C-4 for the format of this question as presented to the respondents.

An additional 26 respondents (6%) indicated that they did abbreviate the process but gave no details. Table 10 below provides sample comments from among another 129 respondents who stated that they either did not use the process (53, 13%) or that there was no need to abbreviate the process (76, 18%). In this latter group, 21 (5%) explicitly distinguished between procedures followed during the preparation phase and procedures followed once the LD was crossed.

Table 10

Additional comments on the estimate process[a]

No process was used after combat operations were initiated. Missions were initiated with immediate response required. Pre combat estimate process was adequate.	CPT, Co Cdr
I used the IOAC standard technique and it worked fine.	CPT, Co Cdr
Was extended not abbreviated by CG, CofS, et al.	MAJ, Div HQ
Process was not used after the initial crossing of the LD	LTC, Bn Cdr
There was no need to abbreviate due to large amount of time available to plan initial attack. Once we crossed the LD we used the FSOP procedures which worked well.	LTC, Asst Div G-3
The estimate process worked well during planning, but the speed of offensive operations forced me to analyze the situation with little input from other staff members and make a decision The key factors were friendly unit locations, known enemy locations, fuel status, ammo status, and the spot where my commander wanted me to go or I decided to go. I ignored or overcame all else.	LTC, Bn Cdr
[a] See Appendices, pages A-5, B-5, and C-4, for the format of this question as presented to the respondents.	

Another question having to do with the overall planning process asked Staff Personnel to indicate whether orders received had given them adequate time to prepare for operations. Most Staff Personnel responding to this question felt that orders did give them adequate time; see Table 11. In a series of related questions about resource availability, also shown in Table 11, roughly 80% of respondents felt that they had sufficient time to accomplish all missions. Roughly 65% felt that there were sufficient assets to accomplish all missions, although less than half of CSS Commanders responding agreed that the assets were sufficient. Roughly 62% felt that there was sufficient support to accomplish all missions; again, fewer than 50% of the CSS Commanders agreed that support was sufficient.

When asked to describe any problems with time availability, 367 provided comments; sample comments are listed in Table 12 below. The most common response was that there was plenty of time prior to the attack, but that FRAGOs, at best, were the only orders issued for the next four days. Some Staff Personnel also commented on frequent, last-minute changes in orders from higher headquarters which left little time for subordinate and/or supporting units to plan and prepare.

Table 11

Ratings of resources available

Survey Items [a]	Survey Form Completed		
	Combat Commander	CSS Commander	Staff Personnel
Did orders received give adequate time to prepare for operations?	[b]	[b]	85%, 1717
Was there sufficient time to accomplish all missions?	82%, 385	77%, 118	79%, 1574
Were there sufficient assets to accomplish all missions?	73%, 390	41%, 117	63%, 1587
Was there sufficient support to accomplish all missions?	68%, 380	49%, 114	61%, 1572

Note. Table entries are the percentage of persons responding "yes" to each item and the number of persons responding to the question.

[a] See Appendices , pages A-6, B-6, and C-5, for the format of these questions as presented to the respondents.

[b] These respondents were not asked this question.

Table 12

Comments on time available to prepare for operations[a]

Events overwhelmed Div staff.	SGM, S-3 NCOIC
After initial breach we had to rush just to get an overlay without Bn graphics to company Cdrs; grids over FM were used to add Bn control measures while on the move..	SGM, Bde OPS
The Bde always prepared contingency plans which made it very easy to adapt to short fuse orders. This...proved to be a Bde strongpoint.	Bde CSM
Commanders and staff received orders in sufficient time to prepare for the majority of the missions. There were, however, many short notice changes. The commanders and staff had the flexibility and practice to quickly plan and execute these changes.	1LT, Eng Bde Asst S-3
Orders were delayed and short fused.	CPT, CO Cdr
Changed too frequently. Got last change 20 minutes prior to mission. Barely gave OPORD to company.	CPT, CO Cdr
There were times when the situation just didn't allow for big planning sessions - leader should receive more training for this in advance courses!	CPT, Bn FDO
Corps orders were issued very late - which forced us to develop many contingency plans (and reducing the amount of thought devoted to each).	CPT, Eng Liaison
As the battlefield became more fluid, short notice FRAGOs became the norm. Execution details were worked out as the mission developed. Overall, the staffs responded well to the flexible situation.	CPT, Asst S-3

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Table 12

Comments on time available to prepare for operations (continued)[a]

Seldom received actual FRAGOs after the initial OPORD, just a series of FRAG PLANs some variant of which we were then verbally ordered to execute. Battle moved too fast for written orders from Corps.	MAJ Asst Div G-3
Corps orders issued on E-mail with no warning orders. No contingency plans issued by corps. Grids not issued to add precision to graphics. "FRAGPLAN" notion substituted for warning orders and fully developed contingency plans.	MAJ, Rgt S-3
Constant last minute changes caused significant re-writes and graphics. General missions usually remained the same. No order was given, FRAGO or otherwise for the pursuit -- only "continue fast."	MAJ, Bde S-3
Corps plans were not timely, forcing Div to jump through a hoop in order to execute; 1/3 - 2/3 rule became 7/8 - 1/8.	LTC, LNO
Too fast paced operations. The 1/3 - 2/3 rule for planning was not applied at Bde level. This impacted on planning/prep time at Bn & Btry level.	LTC, Bn Cdr
[Not a problem] but only because Corps Cdr looked 24 to 48 hours out and we had a contingency plan for almost every option.	COL, Bde Cdr
[a] See Appendices, pages A-6, B-6, and C-5, for the format of these questions as presented to the respondents.	

To summarize, roughly 85% of those who responded felt that the current estimate process is adequate and that orders issued to their units gave them adequate time for preparations. However, there is a strong "minority viewpoint" held by about 15% of the total sample; those in this category included personnel at all echelons and in all types of units. The comments quoted above which are negative in tone do not reflect the opinions of all 2463 respondents, but should be considered indicators of possible problems with the planning and orders processes.

Factors Affecting Ability To Visualize and "Shape" the Battlefield

Two concepts which have become important elements of AirLand Battle Doctrine are "visualizing" and "shaping" the battlefield. No common definition exists of either term. "Visualizing the battlefield" is often used to refer to the process of mentally wargaming your plan against likely enemy reactions, and "shaping the battlefield": is used to refer to the employment of combat power "against enemy forces not in contact...to assure advantage in subsequent engagements." (FM 100-5: Operations. U. S. Army, 1986) Combat and CSS Commanders were asked to comment on any difficulties encountered as they tried to "visualize" and "shape" the battlefield.[2] Of the 232 who responded to the "visualization" question, 21 (9%) simply said they had no difficulty in visualizing the battlefield, and 19 (8%) said that it was impossible to visualize the battlefield. Table 13 below provides a sample of the more detailed responses made by 67 (29%) who identified specific problems which hindered visualization. Problems mentioned included lack

[2] See Appendices, pages A-8 and B-8 for the format of these questions as presented to the respondents.

of detailed intelligence (41, 18%), lack of terrain features (12, 5%) and lack of adequate maps (14, 6%).

Many respondents (84, 37% of those responding to this visualization question) mentioned solutions which helped them visualize the battlefield; Table 14 below provides a sample of these responses. Techniques for aiding visualization included rehearsals, FTXs, and sand table exercises (29, 13%), listening to radio traffic (8, 3%), having good maps and graphics (27, 12%), and direct viewing including placing the commander forward or through the use of scouts or other recon assets (20, 9%). The last two quotes in Table 14 are examples of an additional 41 (18%) of the comments which we could not categorize.

Table 13

Comments on problems visualizing the battlefield[a]

After the battle started, we didn't have a picture at all of the enemy situation.	COL, Bde Cdr
Limited intel on the terrain, plus vague enemy situation, plus limited map availability, combined to limit our ability to visualize.	LTC, Bn Cdr
Lack of maps was big problem. Flat terrain caused navigation problems and therefore visualization problems. Boundaries and phase lines were critical and useful.	LTC, Bn Cdr
Zero illumination under sporadic enemy artillery fire in a Republican Guard berm complex. Had difficulty establishing fields of fire. Arrived at only about ½ solution.	CPT, CO Cdr
[a] See Appendices, pages A-8 and B-8 for the format of these questions as presented to the respondents.	

Table 14

Comments on factors aiding visualization of the battlefield[a]

Terrain boards were utilized at the Bn TF level. Very successful.	COL, Bde Cdr
All voice descriptions are inaccurate by themselves. Multiple observation and position of the commander are vital to getting an accurate view of situation, Commanders have to lead in the front.	COL, Bde Cdr
Sand table rehearsal. Monitoring of Bde O&I nets. No difficulties encountered.	LTC, Bn Cdr
Due to detailed rehearsals, I had a good feel for the battlefield.	CPT, CO Cdr
Sandtables, aerial photos, topo maps - very helpful in battlefield.	CPT, CO Cdr
...overflights along with OH-58s reporting on unit nets were very successful in allowing the ground commander to "view" the battlefield.	CPT, CO Cdr

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Table 14

Comments on factors aiding visualization of the battlefield (continued)[a]

Command group Fwd, about 1.5K behind scouts. S-2 ride w/Sqdn Cdr w/Sqdn & Regt O/I, nets working in Bradley crew compartment. DS Bn LNO ride w/S-3 in back of Bradley.	CPT, CO Cdr
We talked about armored combat at great length and it seemed very effective in focusing the soldiers' efforts.	CPT, CO Cdr
Since we were in Saudi Arabia, we listened to CNN news for up-to-date information.	MAJ, S-2, QM Grp
[a] See Appendices, pages A-8 and B-8 for the format of these questions as presented to the respondents.	

There were relatively few responses (141) to the question "How did you shape the battlefield?" and there was no consistent trend among the answers. Table 15 below provides a sample of respondents' comments.

Table 15

Comments on "shaping" the battlefield[a]

Synchronized all BOS, aggressively reconed, used principal of MASS as dominant theme. Used technology of night thermal to best advantage.	MG, Div Cdr
Liberal use of Scouts, Arty and leading Bde. Mvmt to contact with a pure tank Bn!	COL, Bde Cdr
Use CAS, AH64s, 58Ds to surpress while maneuvered TFs.	COL, Bde Cdr
Maneuvered more quickly than the enemy during exploitation. During breakthrough, isolated front line units from their support and artillery.	LTC, Bn Cdr
Engineer execution of obstacles and site selection for fighting positions.	LTC, Bn Cdr
Not applicable to Bn operations.	LTC, Bn Cdr
Engineers and fire support interdicted the enemy LOC and fire support and direct fire assets engaged enemy traffic approaching the roadblocks. Attack aviation provided long range recon & interdiction.	LTC, Bn Cdr
I don't know what this means and I taught tactics and PCC for 3 years.	LTC, Dep Regt Cdr
We didn't. If we encountered enemy we came on line as a Bde and destroyed them.	MAJ, Bde S-3
[a] See Appendix A, page A-8 for the format of this question as presented to the respondents.	

Factors Affecting the Synchronization of the Battle

We had anticipated that synchronization might become a issue; the fast-paced operation was expected to place severe stress on th aspect of C2, an aspect which has consistently been identified as quite difficult at the combat training centers. A total of 202 Combat Commanders responded to one or

more of a series of questions dealing with synchronization techniques used during different phases of the operation, and 721 Staff Personnel responded to a general question on the topic.[3]

Combat commanders frequently mentioned rehearsal and battle drills as the key techniques allowing them to synchronize their operations. Problems mentioned included coordinating fires of adjacent units, deconflicting airspace, returning through breaches, fuel resupply, mismatches in speed between combat and CS units, and communications failures. Techniques for control of fires included locating the FSO forward, using control graphics, and having a clear designated authority for fire control. Problems mentioned included saturated commo nets and having no assigned priorities. Close, deep, and rear operations were synchronized by specifying clear control and monitoring the roles of the TAC, MAIN, and REAR. The major problem mentioned was the restriction on the deep fight.

The 721 Staff Personnel responses touched on a wide range of topics. Rehearsals and drills were again frequently mentioned as the most important synchronization tools. Execution matrices, synchronization matrices, event matrices and decision support templates were all mentioned as important techniques for aiding in synchronization. Back-briefs, face-to-face coordination, and communications were also frequently cited. Problem areas mentioned included commo, a focus on time-lines rather than event-lines, logistics, and the lack of wargaming.

Factors Affecting Movement and Flexibility

All respondents were asked to indicate which factors from a list of factors had an impact on "movement rate in deep operations." See Table 16 for the average responses. Nearly one third of the Combat Commanders (32%) indicated that EPWs affected movement rates. Other factors frequently checked were supplies (31%), Communications (25%) and CSS Units (24%). Only 7% reported being slowed down by enemy actions. The CSS Commanders emphasized Communications (21%) and Mobility (20%) as the factors limiting movement rate in deep operations.

Due to a mistake in assembling the questionnaires, staff personnel did not have "supplies" as one of the options to check as a factor affecting movement. Otherwise, the profile of Staff responses was similar to the combat commanders, with EPWs being the most frequently cited factor (25%), followed by communications (23%), Mobility (19%), and CSS Units (17%). Beyond those factors we had included on our list, 186 respondents provided additional comments on 15 other factors; these tended to be factors unique to individual units. Congestion on MSRs was most frequently

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[3] See Appendices, pages A-9 and C-7 for the format of these questions as presented to the respondents.

mentioned, including comments about inadequate or nonexistent roads, slow speeds, and congestion caused by units halted astride an MSR.

Table 16

Factors that limited movement rate in deep operations

Disruptive Factor [a]	Combat Cdrs	CSS Cdrs	Staff Personnel
EPWs	32%	13%	25%
Supplies	31%	11%	[b]
Communications	25%	21%	23%
Combat service support units	24%	9%	15%
Mobility	18%	20%	19%
Combat support units	15%	4%	12%
Enemy actions	7%	7%	4%
Refugees	7%	5%	8%
Casualty evacuation	5%	4%	7%
Other?	7%	9%	8%
Total individuals in the sample	415	132	1916

Note. Table entries are the percentage of all respondents to the given form of questionnaire who indicated that a particular factor did have an impact on "movement rate in deep operations."

[a] See Appendices, pages A-10, B-9, and C-8 for the format of these questions as presented to the respondents.

[b] "**Supplies**" was inadvertently excluded from the response list in the questionnaire used by Staff Personnel for their responses.

Weather was mentioned as a limiting factor by 27 respondents (15% of those providing additional comments); equipment limitations, fuel shortages, higher headquarters indecision, and coordination with flanking units were all frequently mentioned.

All respondents were also asked how major limiting factors were overcome. The 868 respondents provided a variety of responses; the comments reproduced in Table 17 below were selected to provide a flavor of the major themes, but we have not attempted a detailed analysis here.

Table 17

Comments on overcoming limitations on movement in deep operations[a]

Fuel and supplies were overcome by brute force. Logistics coming from prior plan from success. Our plan for success did not ever expect this rapid a rate of advance. Commo overcome by moving to execute Corps Cdrs intent.	MG, Div Cdr
Commo can't support - overcome by TACSAT but not enough.	BG, ADC-M
CSS: We drew extra HEMMTs for fuel. Used Log link-up sites to restock supplies, etc.	COL, Bde Cdr

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Table 17

Comments on overcoming limitations on movement in deep operations (continued)[a]

The formation can only move as rapidly as its' slowest critical element. Large comb arms formations can move only 15-20 kph cross country for long distances. Cmbt elements can sprint as required. Massing against enemy overcame resistance & restored rate of march/fix & bypass too. Bn & Bde EPW holding areas allowed continued movement.	COL, Bde Cdr
Deep operations were often decentralized so that divisions closer to the action could monitor/control.	COL, Corps G-3 Plans
Initiative & perseverance & leadership by NCOs & junior officers.	LTC, Bde XO
By-passed EPWs & refugees. Casualty evac was never fixed. Scrounged what supplies we got.	LTC, Bn Cdr
We made up for a lack of doctrine and people and equipment to process EPWs out of hide - cooks used as POW teams.	LTC, Bn Cdr
The major problems were old family of vehicles and personnel shortages we have recognized before, but have not fixed. You don't fix these kinds of problems in combat.	LTC, Div G-3
Leaders stopped unnecessary traffic and moved the artillery unit through the bumper to bumper congestion. Its a good thing Iraq lacked an Air Force or indirect fire capability. It would have been worse than highway 8 near Basrah.	MAJ, FA Bn XO
The bull thru approach. I saw a Bn Cdr jump out of a HMMWV, stop a convoy so his BN could get back on the road. I then saw a Bde Cdr do the same thing.	CPT, CO Cdr
[a] See Appendices, pages A-10, B-9, and C-8 for the format of this question as presented to the respondents.	

In a related question, Combat Commanders were asked how the rapid execution affected their flexibility; see Table 18 below for a sample of the 346 responses. Most of those who responded felt that the rapid execution did **not** affect their flexibility. Many commented on the value of well rehearsed battle drills and prior preparation as key in allowing them to overcome any problems. Some also commented that they **gained** flexibility since the rapid execution kept the enemy forces totally off balance. Some respondents did identify ways in which the rapid execution limited them due to the communications, CSS, and other problems.

Table 18

Comments on movement rate effects on flexibility[a]

It didn't except logistically we had to watch it very carefully - so as to not outrun Class III & H2O.	MG, Div Cdr
The first decision has to be the right one because there wasn't time to change - so battle drills & Cdrs intent w/rehearsals are key to success!	COL, Bde Cdr
It enhanced it by causing all the prior planning and concepts to fall behind in timing of execution thereby giving me more flexibility in execution.	LTC, Bn Cdr
Tested it to the extreme. We were always flexible due to sound battle drills and rehearsals.	LTC, Bn Cdr

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Table 18

Comments on movement rate effects on flexibility (continued)[a]

Based on tactical maneuver at the division level, there was no flexibility at Co Tm level.	CPT, CO Cdr
Aside from the difficulty of tracking the location of friendly unit, it had little limiting effects.	CPT, CO Cdr
We made it rapid. We're air assault.	CPT, CO Cdr
Was not able to live within a crew endurance plan.	CPT, CO Cdr
[a] See Appendix A page A-8 for the format of this question as presented to the respondents.	

Task Organization

Combat Commanders were asked how their task organization affected operations, and Commanders as well as Staff Personnel were asked how specific combat support assets (FA, ADA, etc.) were "task organized to support momentum in combat." See Table 19 below for a sample of the 354 responses to these items; there were some negative comments about the task organization process (frequent, apparently arbitrary attachment and detachment of supporting units, causing disruption in developing plans and building smooth working relationships), and many positive comments and suggestions for new ways to work.

Table 19

Comments on task organization[a]

[Our task organization was the] only thing that saved us. DISCOM T.O. pushed all mobile CSS to FSBs. The mobile assets of MSB and a log TF (tucked in behind Divarty) for continuous movement was key. All nonmobile CSS assets were left behind. All classes of supply possible were unloaded and moved as part of Division formation.	BG, Div ADC-S
Separate Bde is the ideal combat organization w/exception of lack of mobile ADA. We also possess a Bde Scout platoon whose contributions were tremendous.	COL, Bde Cdr
Positively. Armored cavalry regiments and squadrons don't past together special teams and TFs. They're permanently organized as combined arms units which adds speed, simplicity, effectiveness to operations. We need fixed brigades parallel to RCTs of WW II. Otherwise (FA, Engr, MI, MP, Avn) decentralization for offense works - just as doctrine says.	COL, Bde Cdr
Disruptive - one unit attached possessed the same capability as one assigned (and detached). No benefit derived from this.	MAJ, Bn, XO
Task Org was extremely effective, ensured the proper mix at the right place/time.	LTC, Bn Cdr
...we operated an 8 gun battery instead of 2 four gun platoons. This enhanced security and made C2 and logistics easier.	LTC, Bn Cdr

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Table 19

Comments on task organization (continued)[a]

I was pure tanks, the brigade formation compensated for my lack of infantry while capitalizing on the mobility, crew protection, and lethality of my tanks. The other two task forces were balanced: two mech, two tanks..	LTC, Bn Cdr
The task organization at the beginning of the tasks with the Cav was very effective. Flip-flopping Engrs & ADA with mvmt of the SQDN from one Bde to another was counter productive.	LTC, Bn Cdr
[a] See Appendices , pages A-6, B-6, and C-5 for the format of these questions as presented to the respondents.	

Information and Coordination

The three questionnaires contained a number of questions which addressed the availability of information to commanders and staff personnel. Below we first present overall ratings of intelligence and of information on friendly units. We also present sample comments and recommendations on these two issues. Next we present ratings, comments, and recommendations related to the specific process and products of the Intelligence Preparation of the Battlefield (IPB). We conclude this section of the report with a discussion on specific "control and coordination" issues including the use of "control measures" and the use of liaison officers (LNOs).

Overall Assessment of Intelligence Flow and Information on Friendly Units. A number of questions in the surveys addressed aspects of the acquisition and use of information on friendly and enemy units. All respondents were asked to give an overall assessment of intelligence flow and information received on Friendly Units. See Table 20 for a summary of the responses. Slightly more than half of those responding felt that intelligence was timely (though much better from lower to higher than from higher to lower), and a majority felt that information received on Friendly Units was timely, accurate, and complete, with Accuracy receiving slightly higher marks than Timeliness or Completeness. Respondents were also asked follow-up questions related to the items summarized in Table 20. Commanders were asked to "describe any problems [with intelligence flow and Friendly information] and recommendations." Staff were given a more specific item: "Describe any problems in tracking friendly units' progress." A relatively large sampling of the 906 comments is provided in Table 21 (Problems) and Table 22 (Recommendations) below in order to provide a representation of the many varied opinions on these topics which the respondents clearly felt was quite important. Comments addressed many different problem areas and provided a large number of recommendations. For example, many respondents mentioned that distances between CPs and units were too

Table 20

Ratings of intelligence flow and information on friendly units

Issue [a]	Combat Cdrs	CSS Cdrs	Staff Personnel
Was intelligence timely..			
- from higher to lower?	58%, 378	63%, 110	54%, 1546
- from lower to higher?	88%, 361	82%, 99	85%, 1426
Was information received on Friendly Units..			
- Timely?	69%, 362	71%, 99	67%, 1438
- Accurate?	74%, 359	75%, 97	75%, 1401
- Complete?	59%, 358	66%, 97	60%, 1380

Note. Table entries are the percentage of persons responding "yes" to each item and the number of persons responding to the question.

[a] See Appendices, pages A-7, B-6, and C-6 for the format of these questions as presented to the respondents.

great for FM communications, limiting the flow of information on Friendly Units. Another frequently mentioned problem was related to the pursuit phase: the speed of operations reduced the timeliness and accuracy of information on both friendly and enemy units. There were frequent comments from respondents that they generally did not know where other friendly units were located. Many said that it wasn't so difficult tracking units within their chain-of-command, but very difficult tracking other units in their area of operations, particularly units from other services or nations.

Table 21

Comments on problems with intelligence flow, friendly information, and tracking friendly situation[a]

Extended distances - 200k in 100 hrs strained an already inadequate commo system	BG, ADC-M
Higher intel info was slow.	BG, ADC-S
[One of our Divisions] did not follow Corps reporting SOP.	COL, Corps G-3 Plans
Corps to Div linkage was entirely too slow untimely & in many cases, once arrived clarity was lacking. Div techniques of three large CPs were too far apart; most of the time the DREAR could not communicate with the Main CP & never w/ TAC.	LTC, Bde XO
Organic units of Bde was not a problem; flank units was a problem. All tracking was difficult because of lack sufficient NAVAIDS (GPS etc.)	COL, Bde Cdr
Lacked sufficient detail to help the Bde Cdr provide information about enemy forces in-depth at Bde level. Bde Cdr needs a scout element and RPVs.	LTC, Bn Cdr
Couldn't get help thru Div -- Bde did well on intel.	LTC, Bn Cdr
Computer data links using land line revolutionized intel flow. [Intel] flow good, but product (higher to lower) was terrible.	LTC, Bn Cdr

(continued on next page)

Table 21

Comments on problems with intelligence flow, friendly information, and tracking friendly situation (continued)[a]

Since our brigade had minimal control measures it was difficult to track progress. I had to assign a scout section to maintain physical contact with my flank unit in order to keep informed. The lack of navigation aids made reporting of phase lines and checkpoints almost impossible to report accurately.	LTC, Bn Cdr
The extended distances and pace of operations made it difficult to communicate & reports were often "OBE" by the time they arrived.	LTC, Corps G-5
At the Div TAC level, many of the reports that were received were untimely and fractional.	MAJ, Div Asst ADA Officer
Flat didn't know where other units in Corps were at. Time delays of up to 18 hours in getting locations.	MAJ, Div G-5
Corps never practiced or emphasized Log reporting during exercises or BCTPs. And it showed during combat. Units' fuel and ammo status was estimated by Corps planners and push packages shipped based on best guess of unit usage.	MAJ, Corps G-4 Plans
We had great difficulty tracking scouts and mortars which made tracing the FLOT and clearing fires very difficult.	MAJ, Bn S-3
Lack of LNOs between coalition forces results in increased opportunities for fratricide.	MAJ, Sqdn XO
Info in zone was available directly through LNOs. Situation in adjacent zones was not available to most non-divisional units.	MAJ, Arty Bn S-3
Coordination with Bde HQ was such that the units to our flanks and rear were not known for a prolonged period of time.	MAJ, Bn XO
...graphics problem. There were friendly units in direct fire engagements in front of [our] Bde on 27 Feb and we didn't know who they were.	CPT, Bde LNO
Knowing what Div/Bde was supposed to be where did not always make friendly unit ID possible - at Co level, combat markings, if they could be read, could not always be readily translated into unit I.D.	CPT, CO Cdr
It always seemed like the intelligence we got was 1 to 2 days old.	CPT, Eng Co Cdr
[a] See Appendices , pages A-7, B-6, and C-6 for the format of these questions as presented to the respondents.	

There was little agreement on specific recommendations, though several mentioned the need for better navigation equipment, more standardization of commo equipment across units, and more LNOs in the TO&E.

Table 22

Recommendations for improving intelligence flow, friendly information, and tracking friendly situation[a]

Commo range and effectiveness. Need better radios with increased range.	BG, Div ADC-S
Adjacent unit coord thru any higher HQ doesn't work. Adjacent units must have physical contact on the ground and FM commo at Bn & Bde level. More LNOs are needed.	COL, Bde Cdr

(continued on next page)

Table 22

Recommendations for improving intelligence flow, friendly information, and tracking friendly situation (continued)[a]

We listened to BBC on the short wave radio to find out what was going on. Engineer Brigades & Battalions are spread over wide areas and existing commo does not support wide area operations.	COL, Eng Bde Cdr
All tactical units from Battalion to Corps should issue hourly SITREPs on their command nets to update friendly info. Some report must go to adjacent, following and superior headquarters.	COL, Bde Cdr
AFN/CNN was our best source to track units out of our division AO.	MAJ, Bde FSO
C2 and cross talk very effective between ADC (M), Bde Cdrs, Sep Bn Cdrs, DCG and CG. Commo equip worked well.	MAJ, Bn S-03
Good intel received throughout the war. Excellent reports from Air Force ALO on who, what & where we were bombing. Air photos helped soldiers at section level see terrain and our objective.	CPT, CO Cdr
Intel was vague due to the fluid situation. Crosstalk provided hard, real-time information on where friendlies were. It was usually good within the task force.	CPT, CO Cdr
Higher to lower must include Bde picture and occasionally large picture. Info on command net about sister battalion movements was scarce. Accurate info on enemy deposition was nonexistent at the tactical level.	CPT, CO Cdr
[a] See Appendices, pages A-7, B-6, and C-6 for the format of these questions as presented to the respondents.	

Intelligence Process and Products. Several questions addressed the IPB products and other aspects of the intelligence process. See Table 23 below for a summary of ratings.

Roughly 70% percent of respondents thought that the intelligence received was adequate to prepare for combat operations, and roughly 25% of the entire sample said that intelligence was not adequate to prepare for combat operations. Overall, 29% (705) commented on IPB, PIR, or other intelligence areas when responding to follow-up questions; see Table 24 below for a sample of these comments. Of the 705 comments, many identified problems in the dissemination of intelligence, particularly the flow of intelligence from higher to lower. Many commented that, while intelligence was adequate for preparation, it was inadequate during execution. Another frequently mentioned problem, raised more often by Staff than by Combat Commanders, was that intelligence received from higher lacked the resolution and detail to be of any use at their echelon. Two other problems were mentioned by many of the respondents: the overestimation of enemy strength, capability, and resolve; and the incompleteness or inadequacy of intelligence. This latter category includes inadequate intelligence on minefield and other obstacle locations, enemy dispositions, enemy strength, and BDA. In a related question, Combat Commanders rated the effectiveness of the Situation Template as 4.1 on the 7-point effectiveness scale (245 responding).[4]

[4] See Appendix A, page A-5 for the format of this question as presented to the respondents.

Table 23

Ratings of intelligence and IPB products

Survey Item [a]	Combat Cdrs	CSS Cdrs	Staff Personnel
Did your unit receive adequate intelligence in preparation for combat operations? [b]	69%, 401	71%, 104	72%, 1626
Did PIR support commander's intent? [b]	90%, 366	75%, 87	89%, 1366
Rate the effectiveness of the following IPB products: [c]			
- Terrain Analysis	4.7, 352	4.4, 48	4.5, 1253
- Battlefield Area Evaluation	4.5, 327	4.2, 43	4.4, 1199
- Weather Analysis	4.2, 348	3.9, 54	4.1, 1262
- Event Template	3.9, 292	3.8, 32	3.9, 1090
- Decision Support Template	3.9, 272	4.0, 31	3.9, 1041
- Others?	4.5, 24	4.8, 4	

[a] See Appendices , pages A-4,5, B-4,5, and C-4 for the format of these questions as presented to the respondents.

[b] Entries represent the percentages of those responding to this item who responded "Yes" and the number of those responding to this item.

[c] Entries represent the average responses on a seven-point scale where 1 = Low Effectiveness and 7 = High Effectiveness and the number of those responding to a given item.

Table 24

Comments on intelligence process and IPB products[a]

Division had to PULL products. Information, photos, FILM had to be scrounged by Div G-2 from multiple sources - USAF U2, A10 post strike info, British drone, Corps RPV, overhead satellite	MG, Div Cdr
Good TIMELY imagery was limited at best Capability is there - system to produce & provide to field Cdr is BROKEN!!	MG, Div Cdr
Intel was slow in coming and Corps/EAC intel was not responsive to our needs.	BG, Div ADC-M
Engineer units should be viewed as intel providers as well as a prime user of intel. The tendency is to focus on maneuver units only	COL, Eng Bde Cdr
Initial national assets provided superb intel but once combat ops started -we received nothing! We need at Bde level a system to receive satellite comms and intel information	COL, Bde Cdr
There was an initial collection plan but subsequently only the PIR changed, not the collection plan	LTC, Bn Cdr
At the "Big Picture" level we had pretty good intel. At tactical levels (Bn) it was nonexistent, except what my scouts provided.	LTC, Bn Cdr
No Army will ever enter battle with more intel than we did.	LTC, Corps G-2 Air

(continued on next page)

Table 24

Comments on intelligence process and IPB products (continued)[a]

Too much information - not enough analysis. Data dump from God level allowed each G-2/S2 to create his own picture of reality. . . in general it was...[expletive deleted]. Radical changes of intel from day to day w/o explanation. Any SPEC/E5 SGT can take a grid from a higher Cmd and plot it. Not impressed at all by Intel weenies from Bn to Corps.	LTC, Bn Cdr
[Our unit] had priority of intel support during Phase II of Desert Storm within [our] Corps. We received no imagery, had to scrounge for mapsets. Total lack of any info and enemy until we closed & used organic systems.	LTC, Regt S-3
Intelligence was superb It was very important.	MAJ, ARCENT G-3 Plans
The intelligence from ARCENT/Corps was outdated. Info needs to be timely!	MAJ, Div G-3 Ops
PIRs were submitted but not acted upon quickly. PIR were only answered to the individual battalion asking question not allowing everyone the ability to gain from others questions.	MAJ, Bn XO
Intel received focused on Div & higher operations. We needed more info on Brigades and below	MAJ, Bn XO
Lack of updated intelligence. most came from BBC or Air Force.	MAJ, Bn XO
Brigade did not do analysis; only copied Division info. PIR supported commander's intent within the battalion Brigade S2 focus was too high, only passed info; no brigade analysis occurred	MAJ, Bn S-3
PIR is all BS - needs to help CDR. not higher level G-2 staff requirements; PIR should be bottom up. not top down	MAJ, LNO
As a non-divisional unit, only corps level intel was available. Strategic intel was always available in vast quantity but good tactical intel was late and inadequate.	MAJ, FA Bn S-3
I am a Cavalry Troop commander and the level of intelligence I received was for the CG or higher I need enemy information down to at least platoon or company level.	CPT, Trp Cdr
Lack of intel didn't harm us.	CPT, Bde TOC Officer
The intelligence community needs to learn about TACFIRE, its capabilities and files. Maneuver units need to use CBTI for dissemination of combat information and intelligence. Higher FA HQ needs to manage ATI files better to create a more accurate portrayal of combat situation. Maneuver needs to include FA S-2s into their intel distribution more effectively.	CPT, FA Bn S-2
Plenty of intel data, not enough intel analysis.	CPT, Bn FSO
Absolutely superb S-2 work; even though the S-2 had to chase intel.	CPT, Asst S-3
As an S-2, I was not comfortable with the dissemination of information. My commander heard "rumors" which I could neither confirm or deny.	2LT, Eng Bde S-2

[a] See Appendices , pages A-5, B-4 and C-4 for the format of these questions as presented to the respondents

Staff Personnel were also asked whether the IPB turned out to be accurate; 806 said "Yes" and 264 said "No."[5] As a follow-up question they were asked

[5] See Appendix C , page C-9 for the format of this question as presented to the respondents.

if they had recommendations for IPB improvements; see Table 25 below for a sample of the 418 comments. Most did not directly address the question, but rather returned to a more general discussion of intelligence processes and products.

Table 25

Recommendations for improving IPB products[a]

Once IPB is "done", get someone on the ground or similar ground w/equipment to check the analysis	LTC, Corps G-2 Ops
Never in the history of warfare have commanders had such high quality accurate and timely Intel	MAJ, Div G-2 Ops
Get echelons above Division oriented on the needs of the tactical commander. The system is broken. We received more info from our own digging and borrowing from the British than we did from U. S. system.	LTC, Div G-3
Have the MI Brigade produce & distribute terrain & weather overlays for immediate use allowing S-2s to concentrate on situation and fluid parts of the intel analysis.	MAJ, ADA Bde S-3
Proper METT-T Analysis!! Despite significant planning time available, products such as weather forecasting were either not timely (delivered 2 days prior to LD) or completely inaccurate (weather 25% accuracy). Map coverage needs to be quickly generated to cover areas of interest. This should also include imagery and terrain products. AT LD, we were still receiving products for the [wrong area] and enemy unit imagery of [a different wrong area]. Info was not based on mission	2LT, Asst Bde S-2
Slow go/no go terrain inadvertently influences people to assume no one will cross those areas. IPB includes too many overlays and too much information for a tired leader to comprehend and use	MAJ, Bde S-3
Stop holding information at corps and division, pass it down, once the current battle starts Brigade commanders should be allowed to fight it. They need inform ion to focus their power with	CPT, Btry Cdr
Need to design a platform (UAV) that can be deployed forward with the Div Cav Sqdn.	CPT, S-2
For the most part we had an accurate picture of the battlefield. However the imagery clouded the picture in terms of enemy numbers. The actual number of enemy personnel versus the fighting positions varied greatly.	1LT, Bn S-2
The IPB process is sound. Inadequate imagery & poor quality photographs made it impossible for our Bn to really know what was in front of us	1LT, Bn S-2
Treat separate Brigades providing general support as divisions and provide information commensurate with that level	SFC, Bn Ops NCO
At times accurate, but individual intel people withheld info at times to look good at briefing time i.e. (scoop another Bde). need to share more readily.	SSG, Bde NCOIC
[a] See Appendix C , page C-9 for the format of this question as presented to the respondents.	

In a series of related questions [6], Combat Commanders were asked to rate how effective ground and air collection assets were; Ground Collection Assets scored 4.2, just above the mid-point on the 7-point scale (274 responding), and Air Collection Assets scored 5.3 (271 responding). When asked "which collection systems were most effective for your unit?" these

[6] See Appendix A, page A-5 for the format of these questions as presei the respondents.

commanders most often mentioned Air Scouts, OH58D, or AH64 (77), "ground scouts" or "recon" (74), AF, SLAR and Satellite photos (51), and Ground Surveillance Radar (17). Combat Commanders were also asked how Special Operations Forces were integrated into their reconnaissance efforts; among the small number of responses (125) the most common answer was "they weren't." However, there were several very positive and very negative comments about specific intelligence obtained and several general comments that LRSUs were simply not effective given the terrain and the evolving mission (rapid pursuit and exploitation).

Deconflicting Contradictory Information A total of 1089 responded to the question "During the attack, how did you deconflict contradictory information on enemy and friendly units?"[7] Without doing a detailed analysis of the responses, the two most often mentioned methods appear to be "talking directly, face-to-face, with the source" and "checking multiple sources." Oth methods frequently mentioned were "eyes-on" verification, seeking addi nal, confirmatory information from the source, and querying higher headquarters. Many either made no attempt to deconflict information (they relied on common sense or instinct to determine which information was accurate) or felt that they had no means to do so. Many also said that they had never received any contradictory information (although some of these also pointed out that they never received any information at all).

Control Measures and Coordination. Those responding to the Staff version of the questionnaire were asked to evaluate "control measures" and to describe any problems they encountered with control measures.[8] There was a strong feeling that control measures did ensure cooperation between forces (1179 "Yes" vs. 144 "No"), and were not too restrictive to subordinates (157 "Yes, too restrictive" vs. 1093 "No, not too restrictive"). A follow-up question asked respondents to "Describe any difficulties [with control measures]". Of the 401 responding, the most prominent issue was difficulties with the Fire Support Coordination Line (FSCL); the non-doctrinal use of this control measure caused great confusion and concern. Many other respondents cited map-scale and map-detail difficulties, aggravated by the lack of terrain features, and suggested more use of grid lines in lieu of terrain features as anchors for control measures. Large buffer zones between units could have caused control difficulties against an active enemy. Flank coordination difficulties, particularly with slow moving adjacent units (Marines), were mentioned by several respondents. There were also several comments about language difficulties and communications incompatibilities which caused problems coordinating with other members of the coalition forces. Answers to this question provide an interesting contrast across echelons; several corps staff officers commented that the corps had given subordinates "flexibility", while staff at

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[7] See Appendices, pages A-7, B-7 and C-6 for the format of these questions as presented to the respondents.

[8] See Appendix C, page C-5 for the format of these questions as presented to the respondents.

lower echelons criticized the lack of corps and division initiative in establishing and enforcing boundaries.

Staff personnel were also asked to give examples of control procedures used during battlefield operations.[9] One very common recommendation which emerged again from the 504 responses was that grid lines be used as phase lines in terrain without distinguishable features. Colored flags and colored lights were also suggested to assist in control.

In a related question, all respondents were asked to comment on coordination efforts with adjacent units, and on their effects on operations. See Table 26 below for sample responses. Four types of coordination

Table 26

Comments re. coordination efforts with adjacent units[a]

Used LNOs extensively and face to face commander discussion. Essential to success.	MG, Div Cdr
Flank coordination was a constant challenge. Need for liaison officers with good communications was lacking. Ability to coordinate and clear fires across a Division or Corps boundary was cumbersome and ineffective.	BG, Div ADC-S
Coordinated prior to G-day. Shared plans - attached LNOs where appropriate and communicated.	COL, Bde Cdr
We exchanged permanent LNOs to them. Cross talk with a dedicated radio.	COL, Bde Cdr
Scouts were used to identify left and right flanks of adjacent units and to guide units in some movements. FM radio was maintained with adjacent units and the use of way points in LORAN/GPS devices provided an easy means of coordinating boundaries, routes, etc.	LTC, Bn Cdr
Visual/flank tie in necessary. Physical hands on. Full up rehearsals at Bn and Bde were essential.	LTC, Bn Cdr
Critical to operations, not only American units but also allied units. Distance (commo), language, and understanding of how a unit works were the areas that caused the most difficulty.	MAJ, Sqdn XO
The use of scout section and Bradley section from companies enabled TFs to tie in during limited visibility throughout the attack.	CPT, CO Cdr
[a] See Appendices, pages A-7, B-7, and C-7 for the format of this question as presented to the respondents.	

techniques were frequently mentioned by the 1133 respondents: direct radio communications; use of LNOs; face-to-face coordination; and direct contact - typically using scouts. All were generally considered effective, but effectiveness dropped off when the adjacent unit was in a different chain-of-command and using different SOPs. Other techniques mentioned include visual contact, pre-operations rehearsals and coordination, monitoring the adjacent radio nets, and use of coordination and control points. Prevention of fratricide was the most frequently mentioned benefit of effective coordination; several CSS Commanders commented on the dangers their

[9] See Appendices, pages A-7, B-7, and C-6 for the format of this question as presented to the respondents.

units encountered due to lack of information about unexploded friendly munitions.

All personnel were also asked to identify "how were liaison officers used, and where did they come from?"[10] Of the 589 who provided responses to these questions, 44% said they took the LNOs "out of hide" and another 9% indicated that they were overstrength for Desert Storm and were therefore able to meet the LNO requirement without significant negative impact on operations. Typically LNOs were drawn from the G-3/S-3 sections. There was general agreement that LNOs were vital to the success of their operations, and that many more should be allocated in unit MTO&Es.

CP Functions

Combat commanders and staff personnel were asked to respond to a question on the functions which were performed at the TAC, MAIN, and REAR command posts.[11] A total of 983 responses were obtained. A detailed analysis of these responses will require careful study of the different unit MTO&Es and FSOPs; the following provides our initial impressions of this material.

Generally, comm: ıders reported that the TAC controlled the close battle. An ADC(M) reported that all current operations in his division were done at the TAC, while future operations were being done at the MAIN. Staff described the division TAC role as coordination with corps, (partial) control of the close battle, and planning the intermediate battle. We noted that some brigades had "coordination with adjacent brigades" as a TAC function, while others performed this function at MAIN. In at least one brigade a "heavy TAC" took on some MAIN functions, including S-1 and S-4 representation, while the MAIN had all remaining functions including all logistics. According to one battalion commander "the battalion TAC CP is not authorized by our Army" but many battalion commanders reported different functions for a TAC, MAIN and REAR; TAC primarily "fought the battle."

At the MAIN, the major functions were described by commanders as controlling the deep battle, planning future operations, and reporting to higher HQ. Staff described the MAIN as producing intelligence, targeting, synchronization, producing graphics, and division transportation planning. One division G-3 reported that the MAIN never set up once the battle started; at least in this division, execution took place while the staff, and the staff functions, were effectively out of touch "on a convoy from Hell."

One division commander described the major functions of the REAR as collecting prisoners and planning logistics. Responses from other

[10] See Appendices, pages A-7, B-7, and C-6 for the format of this question as presented to the respondents.

[11] See Appendices, pages A-10 and C-7 for the format of this question as presented to the respondents.

commanders discussed coordination and control of logistics and sustainment. One battalion commander reported combining the TOC (i.e., MAIN) and trains to facilitate planning and support.

Communications

All respondents were asked to comment on communications problems and ways found to work around them; in addition, Staff personnel were asked three follow-up questions focusing specifically on communications equipment. A total of 1812 made comments on the general question, and a total of 2016 (82% of the total sample) responded to either the general question or one or more of the follow-ups. Table 27 below provides a sample of the comments. Many felt that communications were a major problem,

Table 27

Comments on communications issues[a]

MSE is a [expletive deleted].	CSM
MSE marginally effective	MAJ, Bn S-3
MSE is exceptional. All other systems FM/AM/VHF suffered from distance problems.	MAJ, Bn S-3
...Div Comms system to Corps needs vast improvement. SS band TACSAT, multi-channel TACSAT were great.	MG, Div Cdr
Weak radios. I used OH58 scouts to perform C&C/LNO duties with the ACR.	LTC, Bn Cdr
Surprisingly, communications worked well. The biggest disappointment was that MSE was not operational in...[adjacent unit].	LTC, Bn Cdr
Two troops in my squadron did not have freqs or call signs in SOI - Solution: Make up one. Multiple units on same freq per SOI - Solution: Change freqs.	LTC, Sqdn Cdr
[Problems with] MSE interface with radio commo. Every time a radio transmission occurs in the TOC it cuts out MSE. MSE is of no use on the move and it takes time to set up. The complete system is too time consuming.	MAJ, Bn XO
With no communication assets on a POW camp TO&E, all commo was consolidated from all coord companies. Still for the size of the operation this was not enough for all Guard Posts. Runners were used constantly.	CPT, MP Bde Ops Officer
The most effective system used was the multi-channel satellite phone system...[but] many times was difficult to talk on because of static...we could talk to customers 50 & 60 miles away with clear lines and not hear others calling from 15 or 20 miles away.	CPT, Bn Trans Officer
We outran our ability to communicate with the Division TAC and TOC. The Bdes talked to each other,...we did not have a separate net for controlling the movement of the Bde TOC formation...the Bde O/I net was further clogged. We needed a short range radio to control our own movements.	CPT, Asst Bde S-3
[a] See Appendices, pages A-7, B-7, and C-6 for the format of this question as presented to the respondents.	

with three issues being frequently mentioned: the age of the equipment (e.g., the VRC-10), the inadequate range of the equipment, and insufficient equipment. The age of the equipment was tied to maintenance and repair problems; the primary solution here was to scrounge extra radios. The

rapid movement of many units over long distances highlighted problems with FM equipment which might have been found quite satisfactory in a more static conflict. MSE got mixed reviews; the first three quotes in Table 26 are from individuals within the same division. As work-arounds, units planned for periods of operation in silence, used back-up PRC-57, used couriers, relayed messages through adjacent units, and used signal flags. Retransmission stations were used to overcome distance problems, but the necessary equipment is scarce. In general, the volume and intensity of responses clearly indicates the importance of effective communications in the lives of our respondents. Not only were members of combat maneuver and combat support units affected, but the JAG, MPs, Chaplains, transporters, suppliers and others were more likely to address this issue than any other single issue in these surveys. A printout of the verbatim responses was provided to the Communications Center and School in the winter of 1991 for their analysis.

Factors Related to the Air War

Combat and CSS Commanders were asked what they were able to accomplish with air superiority that they would otherwise not have been able to do; sample comments are presented in Table 28 below. Of the 377

Table 28

Comments on impact of air superiority[a]

Log base concept of CSS. Ignore camouflage and engineer digging, operate Army aviation, use helicopters for C&C and relay of info.	BG, Div ADC-S
Fast ground maneuver, continuous CAS (in fair weather), unimpeded logistics, massed movement of combat and CSS units,..	COL, Bde Cdr
Total freedom of mvmt for small units, trains, maint and all hello opns.	COL, Bde Cdr
We were able to tighten up our convoys and move more material quickly. We were able to work engineer equipment at nights with lights which improved our safety and efficiency.	COL, Eng Bde Cdr
Logistics support operations continued with virtual impunity.	LTC, Bn Cdr, ASG
Freedom of maneuver, large log pack pushed well forward throughout the battle.	LTC, Bn Cdr
Able to dispatch isolated signal teams without extensive, external security measures.	LTC, Bn Cdr
...for the Bde TF a general feeling that enemy threat from indirect fire, atk aviation and enemy air were negligible --> more aggressive moves.	LTC, Bn Cdr
Freedom of movement on MSR and REAR area operation.	MAJ, Cdr Trans Grp
[a] See Appendices, pages A-7 and B-7 for the format of this question as presented to the respondents.	

who responded many mentioned fast, unimpeded movement as the major benefit of air superiority, while others mentioned the impact on the enemy (degraded will to fight, degraded artillery responsiveness, etc.). The intelligence benefits (e.g., unimpeded aerial recon) and logistics benefits (unimpeded movement) were also mentioned as was the effect on troop morale (less stress, more peace of mind). Combat and CSS Commanders were asked to comment on the impact of Army airspace command and control (A2C2) on operations. A total of 194 responded to this item; for most A2C2 was not a relevant issue. See Table 29 below for sample comments. Many of the responses were negative, citing problems with procedures, dangerous conditions, or the limiting effect on maneuver and fire.

Table 29

Comments on impact of A2C2[a]

Worked OK.	MG, Div Cdr
In absence of CAS, very little. ATACMs clearance took too long.	BG, Div ADC-S
FSCL was misused - had to coord w/USAF for fires across FSCL.	COL, Bde Cdr
Zero effect. Informal control and control altitudes worked.	COL, Bde Cdr
ACAs were apparently not coordinated with the ground maneuver forces. Resulted in several flights of friendly helicopters right through my lines during direct fire & indirect fire engagements. Very dangerous for the copters.	LTC, Bn Cdr
Stupidest set of rules I ever heard. Maneuver during the period [deleted]...forward of [deleted]. .was seriously hamp. ' and soldiers were endangered by the Air Force/Army version of FSCL.	LTC, Bn Cdr
Pain in the neck. The corps had a strangle hold on CAS employment. The FSCL turned out to be a restrictive measure - too much control. Leave with the brigade Cdr.	LTC, Bn Cdr
Affected UAV operations & limited operations.	MAJ, MI Bn XO
A2C2 sometimes shut off the artillery instead of facilitating a combined Air/FA attack on the target.	CPT, Btry Cdr
Often air corridors were not coordinated or provided to lower units. Army aircraft would fly directly to our front during battle forcing us to enforce a 'check fire'.	CPT, CO Cdr
[a] See Appendices, pages A-10 and B-8 for the format of this question as presented to the respondents.	

Training and Preparation for Desert Storm

We anticipated that three elements in the professional history of our respondents would have affected their preparation for Desert Storm: their prior experience with one or more of the Combat Training Centers (CTCs); battle drills carried out during Desert Shield; and rehearsals carried out during Desert Shield. Several questions addressed these topics.

CTC Surprises. All respondents were asked to "Describe any major 'surprises' that your previous experience at combat training centers did not prepare you for"; a total of 1328 provided comments. [12] Of the 1328, however, only 843 had indicated experience at one or more CTC in the personal background portion of the questionnaire. These 843 responses are discussed in detail in a follow-up report: How well did the CTCs prepare units for combat? (Keene and Halpin, in preparation). Respondents addressed 12 different topics including specific methods and procedures (19%), EPWs (13%), specific comments on CTCs (13%), logistics and supply (12%), weapons and equipment effectiveness (12%), navigation and mobility (11%), and morale and attitudes (10%). In general, the comments received were quite positive and affirm the value of the CTCs. Some limitations were identified, many of these unique to Desert Storm, and numerous recommendations provided.

Rehearsals and Battle Drills. All respondents were asked how effective their unit's rehearsals were. See Table 30 below for a summary of the ratings. All gave the rehearsals very high ratings: 6.1 for Combat

Table 30

Ratings of rehearsals and drills

Survey Item [a]	Survey Form Completed		
	Combat Cmdr	CSS Cmdr	Staff Personnel
How effective were your unit's battle drills? [b]	6.0, 341	5.6, 49	c
How effective were your unit's rehearsals? [b]	6.1, 336	5.5, 56	5.5, 1306
Did the rehearsals include the following elements? [d]			
.....Maneuver (AR, IN, AVN)	91%, 276	c	c
.....Reconnaissance	89%, 227	c	c
.....Fire Support	88%, 259	c	c
.....Air Defense	78%, 219	c	c
.....Engineers	80%, 237	c	c
.....Intelligence	84%, 227	c	c
.....Logistics	94%, 268	c	c

[a] See Appendices, pages A-5,6 , B-5 and C-5 for the format of these questions as presented to the respondents.
[b] Table entries are the average ratings on 7-point effectiveness scale and the number of persons responding
[c] These respondents were not asked this question.
[d] Table entries are the percentage of those responding who answered "Yes", and the number of persons responding.

[12] See Appendices, pages A-8, B-8, and C-7 for the format of this question as presented to the respondents

Commanders, 5.5 for CSS Commanders, and 5.5 for Staff, toward the high end of the 7-point response scale. Table 30 also shows the Combat Commanders' responses to a series of questions on which combined arms elements were included in their unit's rehearsals. Both Combat and CSS Commanders were asked to rate their unit's battle drills; these also received a high rating, 6.0 and 5.6 respectively. When Combat Commanders were asked what level the drills were conducted, the answers included all echelons from brigade to tank crew.

All respondents were also asked whether they had used any new rehearsal techniques. Many of the 870 who responded explicitly said that they had done "nothing new", but most respondents provided extensive comments emphasizing the importance of rehearsals. See Table 31 below for a sample of these comments. Most units conducted full-up rehearsals in addition to the standard sand table, map exercises, and terrain board rehearsals. Many mentioned giant scale models, rehearsals using HMMWVs in place of armored vehicles, and construction of replicas of enemy defensive positions.

Table 31

Comments on rehearsal techniques[a]

Same techniques we used at NTC with two exceptions: added importance was given to LOG rehearsals and the division was able to conduct full up Bn/Bde and Div rehearsals with all equip.	BG, Div ADC-M
Large scale "sand table" with actual soldiers standing in to identify units.	LTC, Div G-4
Large sand table walk thru for TF drills. TF plan, and brigade scheme of maneuver. Well done. NTC/CMTC drill works. SOPs are all important!	LTC, TF Cdr
Large scale terrain models that we conducted TEWTs on.	MAJ, Bn XO
"Rubber duck" or detailed sand table walk through with Cdr's and staff actually standing on the terrain model.	MAJ, Dep Div G-3
DST and a "duck walk" - on the ground - each CDR/Sep Bn & Bn Cdrs to include support - CSS	MAJ, Div G-2 Plans
Excellent had we known our role. We had 4 rehearsals for Plan #1 and one rehearsal for Plan #2. We executed Plan #2.	MAJ, S-3
Problem on Log side was only one major rehearsal/Mapex prior to the attack.	CPT, Asst Div G-4
Used HMMWVs as opposed to armored vehicles in a full-up rehearsal.	CPT, CO Cdr
We walked through company/Bn maneuvers. Repetitively practiced trench clearing, EPW processing of large #'s of EPWs, casualty evacuation at company level, assault, etc.	CPT, CO Cdr

[a] See Appendices, pages A-5 , B-5, and C-5 for the format of this question as presented to the respondents.

Weapon Effectiveness

The surveys included several questions on weapon effectiveness and related topics. See Table 32 below for average ratings of the effectiveness of organic weapons against different types of targets. Verbatim comments on successes and failures in the use of organic weapons are not reproduced here due to possible sensitivity of the data. Most of the 612 comments were very positive, and included comparison of the relative effectiveness of U. S. weapon systems and enemy systems. Both M1A1 and Bradley 25mm were very effective against bunkers and point targets, DPICM was effective against tanks, 50 caliber against trenches, and the TOW2A was extremely effective against armor. The most notable weapons failure mentioned (other than Soviet tanks) was the Cobra-launched TOW2A which repeatedly malfunctioned. Other problems mentioned included the M1A1 optics and a jamming problem on the Cobra 20mm.

Table 32

Ratings of weapon effectiveness

Survey Item [a]	Staff Personnel
Rate the effectiveness of your organic weapons against...	
...Armored Personnel Carriers	6.0, 851
...Armor	5.6, 822
...Bunkers	5.7, 891

Note. Entries represent average responses on a seven-point scale and the number of persons responding to the item; a rating of 1 = Low Effectiveness and 7 = High Effectiveness.

[a] See Appendix C, page C-7 for the format of these questions as presented to the respondents.

Table 33

Ratings of ability to mass fires

Survey Item [a]	Combat Cmdrs	Staff Personnel
Were you able to mass fires...		
...upon initiation of combat?	76%, 262	78%, 872
...during the exploitation phase?	66%, 237	72%, 792
...during the pursuit phrase?	61%, 222	67%, 752

Note. Table entries are the percentage of persons responding "yes" to each item and the number of persons responding.

[a] See Appendices, pages A-6 and C-5 for the format of these questions as presented to the respondents.

As shown in Table 33 above, Combat Commanders and Staff were asked to address the "massing of fires", an important element in the use of field

artillery to support maneuver forces. There were relatively few who responded to these questions. Even though well over half of those who did respond reported that they had been able to "mass fires", their accompanying comments most often discussed difficulties with the use of field artillery to support such a fast-moving ground operation. The primary issue here was the discrepancy between the speed of the M1A1 tanks and the speed of field artillery and other support vehicles.

A series of related questions on field artillery (FA) and air defense (ADA) issues were included in the Staff version of the questionnaire.[13] See Table 19 for a sample of some of the 1166 responses to a related question about "task organization to support momentum in combat."

Asked to rate the effectiveness of the FA "decide, detect, and deliver" systems, 607 respondents gave an average rating of 5.7, high on the 7-point effectiveness scale. "Identification of high-payoff targets" was given a similar high rating of 5.5 by 575 respondents.

In a follow-up question, Staff personnel were asked to "describe problem areas [related to the effectiveness of fire support and the identification of high-payoff targets]." See Table 34 below for a sample of the 240 comments provided.

Technical issues related to FA addressed in the Staff survey included "the methods of survey which were most effective", the location of FSOs and FSCOORDs during the battle, and comments on FSO command and control (C2) problems. Also note the discussion of control measures and coordination, page 32 above. Concerning "methods of survey", virtually all of the 235 respondents mentioned GPS and/or PADs and/or LORAN. Although the details varied from unit to unit and across echelons, most of the 519 responding to the "location of FSOs..." item reported either "with the maneuver commander" or "forward". A sample of the 219 responses to the question of C2 problems of the FSO is presented in Table 35 below. While many of the comments reiterated communications problems discussed above (see Table 27), the details provide insights into particular "fixes" or "work-arounds" which were used.

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[13] See Appendix C, page C-11 for the content and format of these questions as presented to the respondents.

Table 34

Comments on problems with fire support[a]

Speed of M109 & M110 and CATV all too slow. Q36/37 functioned well, especially in concert with MLRS. MLRS was fast, responsive and devastating.	COL, Bde Cdr
No intel tgts for fire support. Need RPV at division.	COL, FA Bde Cdr
No system to provide accurate target information rapidly to the guns. Need RPVs to detect targets, down link to artillery units and then provide rapid BDA.	LTC, Div G-3
[There was no fire support]...for CS units like ours	LTC, Eng Grp S-3
Identification of HPT is not the issue, it's the ability of the intel community to locate the target to within an accuracy that the system/shooter can engage.	MAJ, Bde FSO
Fire planning was almost all top-down. We were provided with planned tgts from Divarty, unplanned tgts from TF Fist or aerial obsrs.	MAJ, Bn S-3
Cross-boundary targets outside Div sector were difficult to clear as we tried to ensure [that] friendly forces [were] clear.	MAJ, Dep Div G-3
Arty support was very responsive. Div Scouts and the supporting arty worked well. Aero Scouts shot more missions on G-Day than anyone else.	MAJ, S-3
Approval level for artillery fires hindered timely spt. Resulted in firing Task Force mortars.	MAJ, S-3
DPICM is a big problem, caused a lot of friendly casualties, impeded maneuver.	CPT, Eng Bde CO Cdr
Problem areas: Clearing fires, helicopters in the way, Air Force demanding say for fires beyond the FSCL.	CPT, Btry Cdr
[a] See Appendix C, page C-11 for the format of this question as presented to the respondents.	

Table 35

Comments on FSO C2 problems[a]

When FSO was not with Cdr they could not clear fires quickly.	COL, Bde Cdr
When FSO was in the TOC, he encountered no problems. When he was put in the ALO track or M3 with the Cdr, he couldn't talk.	LTC, Sqdn XO
Significant problems with numbers of radios. The ALO pallet in the M113 has three antennas. The FSO requires 4 nets (Bn Cmd, mortar, digital, and Arty Cmd) which is difficult to rig and puts another 4 antennas on the track. He cannot ride in a tank because of the radio problem and unless he has the radios, can't get enough info to be effective.	LTC, Bn Cdr
Need more radios to monitor maneuver command, fire support coordination, mortar, and fire direction nets (voice and digital).	MAJ, Bde FSO

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Table 35

Comments on FSO C2 problems (continued)[a]

TOC was out of range of everyone during attack.	MAJ, Bde FSO
Radio communications over long distances with a PRC-57. Bde FSE had to have a vehicle radio and OE-254 for reliable communication.	MAJ, Bde FSO
Really none, we cleared fires in our sector very quickly. NCO in CO's track worked. He monitored the fire support & command nets.	MAJ, S-3
Control measures did not agree (TRPs & target lists not accurate)	MAJ, S-3/XO
Difficulty maintaining secure commo w/ Bn mortar platoon while dismounted.	CPT, CO Cdr
Radio shortages. FO's in platoons did not have necessary equipment or nets for radio usage.	CPT, FSO
Radio configuration in FIST V is not adequate to communicate both digital and voice traffic to TACFIRE over extended distances.	CPT, TF FSO
Loss of radio contact because of distances, and inability of arty batteries to keep up with rapid advance of maneuver.	CPT, FSO
[a] See Appendix C, page C-11 for the format of this question as presented to the respondents.	

Several questions related to air defense artillery (ADA)[14] were included in the Staff survey, but relatively little information was obtained due to the lack of any viable air threat. Asked if ADA priorities were correctly identified and executed, 95% of the 655 responding said "yes". Asked if there were IFF problems, 64% of the 476 responding said "no". Table 36 below provides a sample of the 164 comments that were obtained on a follow-up ton "ADA priorities" and of the 211 comments on IFF issues.

Table 36

Comments on ADA and IFF issues[a]

Don't know exact problems, but less than 50% of our IFF systems worked.	LTC, Div G-3
Coalition warfare is always a challenge. Pre-hostility training emphasis helped.	LTC, Div G-3
ADA unit perceived too many priorities for their assets. Needed a GS force/Corps ADA Bde including SHORAD to reinforce Divs.	MAJ, Corps G-3 / Air Defense
Early warning system needed	MAJ, Avn Bde Bn XO
...we need a common IFF system for ground forces as well as aircraft. Electronic much better than using IHFR from the 8/43 ADA HIMAD initiating the early warning cell. Transfer to the Div Ops net.	MAJ, Div ADSO

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[14] See Appendix C, page C-11 for the content and format of these questions as presented to the respondents.

Table 36

Comments on ADA and IFF issues (continued)[a]

Helicopter markings helped a whole lot. Enemy fixed winged aircraft were non-existent in our sector.	MAJ, Div Dep G-3
IFF Problems: Aviation & pilot compliance with IFF and A2C2 plan. IFF programmers for Stinger short, difficult to train & maintain.	MAJ, Corps G-3 /Air Defense
The ADA soldiers are heavily weighted down with their rounds/radio and necessity items. Need to develop a light weight ADA round for light infantry.	CPT, Asst S-3
A Stinger Tm is a must for all front line units.	CPT, Asst S-3
Air Force jets continually failed to load their IFF codes which resulted in our unit requesting through the Air Force TACC to engage.	CPT, ADA Bde Asst S-3
System malfunctions, lane coordination, human error.	CPT, Avn Bde Asst S-3
We need to integrate ADA into our training much more. The MISCUS early warning system was something which was totally new to us.	1LT, Bn S-2
More assets closer to FEBA if possible.	MSG, Ops SGT

[a] See Appendix C, page C-11 for the format of these questions as presented to the respondents.

Staff personnel were also asked to comment on another weapon, PSYOPS. [15] PSYOPS was very favorably mentioned by 729 respondents as a significant factor in reducing the enemy will to fight. Virtually all EPWs were reported to have had leaflets; some respondents felt that the leaflets encouraged defection, while others felt that they provided "how-to" instructions for those ready to defect anyway. One respondent cautioned that native-speakers, as opposed to linguists, would have been more effective in creating the material.

Logistics

All respondents were asked a series of questions on logistics issues. Table 37 below provides a summary of responses on five general issues. Roughly 75% of the respondents did feel that logistics support was adequate, less felt that it was positioned properly, and barely half felt that the PLL stockage was adequate. Controlled substitutions were extensively used; in response to a follow-up question, the battalion commander was most often identified as the individual with authority in this area.

In responses on follow-up items, the supply and distribution system were among the most frequently mentioned problems in Desert Shield and Desert Storm operations. Problems included inadequate transport, the lack of a good "push" system, failure to cope with the great distances, and inefficient

[15] See Appendix C, page C-10 for the format of this question as presented to the respondents.

management. Solutions suggested or reported included more transport equipment, prioritized requirements, more drive. ., and dedicated, hard working logisticians.

Table 37

Ratings of logistics factors

Survey Item [a]	Survey Form Completed		
	Combat Cmdr	CSS Cmdr	Staff Personnel
Was your logistics support adequate overall?	68%, 391	[b]	74%, 1628
Was it positioned correctly for deep operations?	64%, 323	[b]	70%, 1294
Was the combat PLL stockage adequate?	52%, 366	50%, 90	55%, 1267
Were controlled substitutions used?	87%, 356	74%, 101	79%, 1136
If you used TDA equipment, was it due to:			
...Identified mission requirements?	73%, 155	86%, 59	80%, 566
...TOE shortages?	50%, 165	58%, 66	52%, 543

Note. Table entries are the percentages of "Yes" responses and the number of responses.

[a] See Appendices, pages A-11, B-9,10, and C-8 ,9 for the format of these questions as presented to the respondents.

[b] These respondents were not asked this question.

TDA equipment taken to theater was primarily modern electronics: computers, FAX machines, and navigation equipment. One washing machine and one refrigerator were reported. The identified need was a mix of mission requirements and TO&E shortages.

Most respondents agreed that they could not ve completed the operation without Host Nation support.[16] The most f quently mentioned item was the HET. Food, fuel, water, and linguists were also welcomed. Problems identified included lack of support during combat, repair problems with rented equipment, little sense of urgency and poor responsiveness.

CSS commanders were asked to identify the supply class which was most difficult to s pply; [17] fuel, water and spare parts were frequently mentioned. The primary problem identified was the shortage of these materials, with transportation and handling issues quite secondary. However, when asked what problems they had in supporting fast moving operations, these respondents identified the lack of cross-country mobility as a major concern. Other problems were the lack of information on the location of their "customers" and the lack of fuel. A COSCOM deputy commander also mentioned problems in the command and control of

[16] See Appendices, pages A-11, B-10, and C-9 for the format of this question as presented to the respondents.

[17] See Appendix B, page B-9 for the format of these questions as presented to the respondents.

subordinate brigades/groups. Staff officers were asked to describe their experience with supply distribution and to describe how problems were overcome.[18] The dominant comment from the 646 respondents had to do with transportation difficulties, and common solutions included begging, borrowing, and scrour ng. There were also a number of comments about the lack of an effective supply "push", requiring them to "pull" supplies forward.

Staff personnel were asked a number of additional detailed questions about CSS issues; some of these items were formatted as rating-type questions, with ratings on a 1-7 "quality" scale, and others were yes-no questions. See Table 38 below for average ratings and Table 39 below for the percentage of agreement on the yes-no items. Note that all of the details rated received average ratings at about the mid-point on the seven point scale or slightly above. The highest number of responses by far, and the lowest rating, was given to the "supply distribution system". A total of 542 respondents provided comments on the follow-up question to the rating-type items: "describe the problem areas and recommend solutions." A sample of these comments is presented in Table 40 below. As might be expected from the ratings and from earlier comments, many of the remarks in the follow up question focused on transportation issues. A number of respondents provided substantive recommendations with respect to supply and/or transportation.

Table 38

Staff ratings of miscellaneous CSS factors

Survey Item [a]	Average Rating	
Rate the quality of the following:		
...Combat battle damage estimation	4.6,	704
...Maintenance failure estimation	4.6,	835
...Expected workload estimation	4.6,	883
...Support to heavy/light task forces	4.4,	620
...Interservice CSS support	4.1,	537
...Numbers of Army motor transport assets	4.0,	566
...Supply distribution system	3.8,	1080

Note. 1 = "Low" quality, 7 = "High" quality. Entries are average ratings and the number of persons responding.

[a] See Appendix C, page C-12 for the format of this question as presented to the respondents.

[18] See Appendix B, page C-12 for the format of this question as presented to the respondents.

Table 39

Additional staff ratings of miscellaneous CSS factors

Survey Item [a]	Responses
Were there sufficient assets to support the method of supply distribution to the units?	51%, 1216
Were injured or wounded personnel individually tracked upon entering the medical treatment system?	72%, 1012
Were all levels of command provided adequate casualty information?	60%, 1035
Was the medical evacuation system prepared to handle anticipated casualties?	85%, 1124
Did EPWs create any burden on the casualty evacuation system?	33%, 920
Note. Entries are the percentage of "yes" responses and the number of persons respondin [a] See Appendix C, pages C-12 and C-13 for the format of these questions as presented to the respondents.	

Table 40

Staff comments on miscellaneous CSS factors[a]

FSBs need high mobility transports.	COL, Bde Cdr
Need more trucks	COL, Div G-2
The Army needs more HETs. Add such units to Corps and Divisions.	COL, Corps G-3 Plans
Substitute 2 x HEMMTs for every 1 5k tanker trailer in FSB.	LTC, Bde XO
...Turnaround on aircraft was astounding simply from the environment. The Reserve units in theater were life savers. ...	LTC, Bde XO
The Army needs more trucks. Probably by putting more assets in each unit, and raising ALO to 1, equipping active units with new series trucks. Many active truck units accomplished wartime mission with 30 yrs old M52s and 25 yr old 2 1/2 trucks. This is unfortunate. ...	LTC, Trans Grp Bn Cdr
Need additional medium truck companies in our DISCOM plus HEMMT fuelers & HEMMT based 7510[illegible] for trailer. Need 70 HETs minimum & new M88 TR.	LTC, Div G-3
Not enough haul assets authorized on Engineer MTOE.	MAJ, Eng Bde S-4
Area support is OK until the supported unit moves. If the supported unit moves to a new location, different from the support unit, then all requisitions will become void or long convoys are required.	MAJ, Sig Bde S-4
We had fewer vehicles break down than expected (not a problem, but maintenance failure estimate was off).	MAJ, Bn XO

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Table 40

Staff comments on m scellaneous CSS factors (continued)[a]

Operation was non standard. Don't change all processes to cover this [unusual operation]. If we had entered sustained combat, all would have worked better - except transportation.	MAJ, Sqdn XO
Pushed items came OK; basic load ammo was slow; pulled items were very difficult. The Marines got tired of us trying to beg M60 tank parts and cut us off. We had what we needed when we crossed the LD, but it took months to get ready. Unit leaders spent a lot of time trying to find supplies. The transportation system had too few assets and often lost things or sent them to the wrong destination. Supporters seemed to know that if they just waited long enough, units would solve their own problems.	MAJ, Bn XO
[a] See Appendix C, pages C-12 and C-13 for the format of these questions as presented to the respondents.	

The Staff personnel were also asked to make additional comments on the items summarized in Table 39 above. A total of 526 comments were provided on procedures for tracking casualties and providing casualty information to all levels of command. A sample of these comments is provided in Table 41 below. There was very general agreement among respondents that the casualty reporting system, if there is one, is seriously flawed and needs fixing. An additional 387 comments were provided on the last two items in Table 39, which asked whether the medical evacuation system was prepared and whether EPWs created a burden on the casualty evacuation system. See Table 42 below for a sample of these comments. A number of respondents made general criticisms of casualty evacuation doctrine and procedures, while others identified specific problem areas. Most prominent among the identified problems were the shortage of evacuation transport and the failure to position available transport far enough forward. There were also some comments about poor communications. The impact of the high volume of EPWs received relatively few comments. Note the two related items on personnel evacuation and EPW handling reported in Table 4 above.

Table 41

Staff comments on casualty reporting[a]

After Div, Army HQs only passed numbers. [our division] had to station LNOs at every hospital in AO to get info. - No info from USAF or Navy hospitals.	COL, Bde Cdr
This was constant dilemma possibly resulting from Interservice medical evacuation chain & differing techniques in Naval hospital system.	COL, Bde Cdr
This is broken!! Once they enter the medical chain they are lost. The med gp Cdr must be fixed with responsibility to track patients. Information should be automated and made available to Div Hosp LNOs and S-1s.	COL, Bde Cdr
...units had to put LNOs at each step of the Evac System.	COL, Corps G-4
Some problem tracking Army personnel evacs to naval hospitals prior to start of war. Need joint system for casualty tracking.	LTC, ARCENT

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Table 41

Staff comments on casualty reporting (continued)[a]

Once evac out of Div they became lost/unaccountable.	LTC, Bde XO
This is a tremendous problem. Even today (13 Apr 91) I don't know the exact status of some of my wounded soldiers from 27 Feb! We are too hasty to evacuate too far to the rear.	LTC, Bn Cdr
Medevac system "lost" patients and was slow and not designed for patient	LTC, QM Grp Bn Cdr
Lack of information of who was where, when & what. [Higher HQ] constantly did not keep units or families properly informed even to chaplains at unit level.	LTC, Chaplain
G-1? Surgeon? Med channels? The receiving hospital reports to whom? The patient tracking system is broke. Recommend G-1 be held accountable for patient tracking but that the medical system support that by sending initial report of patient receipt to the owning division.	LTC, DISCOM XO
Reporting of casualties by name was policy till the air war started - then policy/doctrine was changed to #'s (not names). Due to low casualty figures, names were reinstituted, to provide better accountability	LTC, MEDCOM Bde XO
Yes, but the system is broken. A division has only 3 personnel casualty team - not enough. When a unit has only 3 personnel to process and track casualties, the system won't work. Every division must be augmented for combat by a very robust casualty team. We fixed something that wasn't broken when we did away with the AG Co.	LTC, Div G-3
You lost knowledge of men whom field hosp decided to evac. Never knew if they went to FRG, Navy ship or USA. Found out 2-3 wks later through calls to rear det at...[home station]	MAJ, Eng Bde Bn XO
Took monumental effort by chain of command and time (2 months) to track wounded soldiers, we finally got 100% acco ntability on 20 Apr 91.	MAJ, Bn S-3
[a] See Appendix C, page C-12 for the format of this question as presented to the respondents.	

Table 42

Staff comments on casualty evacuation[a]

If we had had massive casualties the system would have failed.	BG, ADC-M
Aero Medevac organizational structure/C2/maintenance structure a serious problem.	COL, ARCENT
...Medevac system was not prepared Air CASEVAC A/C were positioned too far to rear. Ground system was too far for evac of severely wounded in safe or timely manner. Result was 2 KIA that may have been saved.	COL, Bde Cdr
Sufficient medical evac capability was presen Every litter urgent patient during combat required a call on the Division Cmd net to get a Medevac bird. Med pers don't know how to design and execute a C2 system that works!	COL, Bde Cdr
EPWs were the major type of casualty - early problems with MPs and ICRC (Red Cross) were worked out. System functioned relatively smoothly.	LTC, MEDCOM Bde XO
[Need] Bigger helicopters (UH-60A), bigger fleets - better commo	LTC, COSCOM

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Table 42

Staff comments on casualty evacuation (continued)[a]

Look at TOE! Change TOE.	MAJ, FA Bn S-3
We have 4 of 8 authorized ambulances and had to divert cargo trucks to haul EPWs, etc. which made them unavailable to use for their intended missions. Recommendations: Give us our TO&E quantities!!	MAJ, Bn XO
Hospitals were adequate but air evac assets barely kept up w/ the minimal casualties we had. Big problems were control of helo's/navigation/commo to request Medevac SYSTEM BROKE.	MAJ, Div Asst G-3 Plans
CASEVAC helicopters need to be on Div Cmd net. Assets were sufficient but not responsive.	MAJ, Div DTAC/G-3 Ops Ofc
Medical units were pushed forward into Iraq as part of the log base system. Made for more responsive support - saved lives to include EPWs & refugees.	MAJ, Corps G-3 Ops Ofc
Refugees treated in medical system presented problem of tracking. Linguists were not stationed in medical system until after 1 week of refugee evac - no dedicated civil affairs personnel at hospitals to track patients.	MAJ, Div G-5 Ofc
[a] See Appendix C, page C-13 for the format of this question as presented to the respondents.	

Security Issues

There were three types of security issues addressed by the questionnaires: the utilization of MPs in general; the use of MPs in dealing with EPWs; and the general topic of EOD (explosive ordinance disposal). Table 43 below provides the responses of Staff personnel to five questions related to two of these topics. One follow-up question asked whether there were other uses

Table 43

Staff ratings of miscellaneous security factors

Survey Item [a]	Responses
Were MP patrols used on MSRs?	95%, 1318
Were MP patrols used with convoys?	78%, 1191
Were MPs sufficiently equipped to process EPWs?	59%, 882
Were problems encountered in the handover of EPWs from capturing units to the MPs?	44%, 781
Was there sufficient coordination between the Movement Control Center and the MPs?	68%, 611
Note. Table entries are the percentage of "yes" responses and the number of persons responding. [a] See Appendix C, pages C-13 and C-14 for the format of these questions as presented to the respondents.	

made of MPs besides convoy and route protection; the 103 responses mentioned handling of EPWs, manning checkpoints, controlling civilian refugees, providing area security in rear areas, and protecting Class V convoys. A follow-up to the last three items in Table 43 elicited 465 responses; see Table 44 for sample comments. There was strong agreement that the volume of EPWs far exceeded the capacity of the system; however, there were very few problems attributed to the MP procedures or actions.

Table 44

Staff comments on MP and EPW issues[a]

Far too many EPWs - too few MPs	BG, Div ADC-M
MPs had no secure FM radios, no transportation for EPWs, and not enough MPs for the massive amount of casualties.	COL, Bde Cdr
The numbers of EPWs were overwhelming. The MPs however did a great job. Evacuation by EAC from the Corps cage was slow.	COL, Corps G-3 Plans
MP unit was NG & had not worked with a tactical unit. Responsibilities had to be defined as to what their duties were. You never had enough MPs to do the msn.	LTC, Bde XO
There was limited coordination between the MCCs and anyone else.	LTC, Trans Grp Bn Cdr
Many Iraqi civ & EPWs in our hospitals - needed more MPs to guard them and effect movement of them.	LTC, COSCOM
Not enough trans to support EPW msn, we needed them to move supplies - We borrowed Iraqis vehicles to move EPWs.	LTC, COSCOM XO
Massive amount of EPWs strained our log system. Corps did a superb job w/ taking our EPWs off our hands quickly.	LTC, DISCOM XO
Not prepared for mission; TO&E shortages didn't help.	MAJ, Bn S-3
Apparent to users that MCC and MPs had no plan and no control.	MAJ, Bde S-3
Bde constructed EPW cages w/MP (DS) Plt to assist along w/Eng assets	MAJ, Bn S-3
Because speed was critical to the plan, tactical units had to quickly shed their prisoners, however, the MPs could not get to tactical units from the Corps' second echelon to accept them so they became a drag on the Support Sqdn and, in turn, on the Regt as a whole.	CPT, Troop Cdr
[a] See Appendix C, page C-14 for the format of this question as presented to the respondents.	

Both Staff and CSS Commanders were asked to describe any problems or recommendations with respect to EOD; a total of 389 comments were provided. A sample of these comments is provided in Table 45 below. As with the EPW issue, there were many comments to the effect that the system was overwhelmed. However, many more of the respondents to this question provided substantive discussion of what they had done to solve the problem or of what needed to be done in the future.

Table 45

Comments on EOD issues[a]

Keeping EOD with DISCOM appears adequate during the defense. During the offense, their expertise is needed forward. Recommend they be employed as teams forward with Eng units during offensive operations.	MAJ, Div Asst Eng
Needed more EOD or EOD qualified troops. Due to the massive amount of unexploded USAF ordnance throughout Iraq, friendlies were often at risk. We needed more folks... EOD folks need to exercise a bit more caution destroying enemy ammo. ..	MAJ, Bde ALO
Units should have more personnel trained to do demo. We could have ensured the complete destruction/demilitarization of a lot more of the equipment in Iraq.	MAJ, Bde FSO
EOD were good and essential	MAJ, Eng Bde S-3
There were/are a tremendous amount of unexploded ordnance laying around on the battlefield. Danger is to dismounts and wheeled vehicles. EOD after the war was effective in clearing, but engineers did most of the work. Not aware of EOD use during combat operations.	MAJ, Bn XO
EOD likely did not receive satisfactory intelligence on a continuous basis until well after the offensive.	MAJ, MI Bde Bn XO
Controlled by corps. Only given to divisions when mission identif .d. 36 to 48 hour response time due to distance to travel forward (too far in rear).	MAJ, Div Dep G-3
EOD is not adequately resourced in the division. Non-Div EOD units must be "attached" to be most effective	MAJ, Div Dep G-3
We found munitions in an area that no one would pick up. We buried them with a dozer & they're still there.	MAJ, QM Grp S-3
My engineers did the majority of EOD functions.	LTC, Bn Cdr
[a] See Appendices, pages B-9 and C-10 for the format of this question as presented to the respondents.	

Candidates for Lessons Learned

Respondents were asked to identify any new techniques or ideas which they thought should be passed along as Lessons Learned. Highly detailed comments and recommendations were made concerning many aspects of every battlefield operating system. The most frequent remarks had to do with equipment, including the GPS navigation system. Frequent mention was made of the desert wedge formation in maneuver, and also of the importance of rehearsals. The comments presented in Table 46 provide a flavor of the variety and quality of the responses received.

Table 46

Lessons Learned identified by survey respondents[a]

We need to lay out the doctrine for a division level breach of a complex obstacle system.	BG, Div ADC-M
We built a Fire Support Element for the Aviation Squadron and assigned the Sqdn a FAC. Indispensable.	COL, Bde Cdr
From DIV we fought 4 battles simultaneously - close, deep, rear, and intermediate deep. The intermediate deep zone was between 10-30 kms forward of the FLOT & where the majority of the DIV-directed AH64 Bn attack missions were flown. USAF was used as BAI exclusively, 10-70 + kms deep, usually 50+ kms.	LTC, Div G-3
Used tail lights with colored lens to mark and identify vehicles at night.	LTC, Bn Cdr
We set up an FOB (Forward Operating Base) concept instead of the full-up BSA. This allowed the Brigade Cdr to have a much smaller log tail. The FOB was nothing more than a large "Log Pad" that received/stored supplies.	LTC, DISCOM XO
[Our division] exploited national systems prior to a movement to contact in such a way as to turn it into a deliberate attack -- IMINT gave us detailed information on the enemy 40-100K's away from us in a way usually gathered by Patrols at NTC (where units may be in contact).	MAJ, Div Chief, ASIC
IEW assets must be organized as C&J Plts in order to provide adequate mission flexibility and command and control for any but the most static of situations; C&J Plts (with attached 2-man contact teams) must be integrated into the maneuver scheme for lead Sqdns. S-3 is terrain manager; Plt ldr must coordinate. QUICKFIX is best suited for scan/tipoff mission while ground assets concentrate on movement. C&J Plts must have a third TRQ-32...for baseline in order to DF/target. Interrogators/translators must be used both at cage and with forward units. GSR can be effectively used for FA and direct the engagement. GSR teams should always be paired with a Bradley.	MAJ, ACR, Sep MI CO Cdr
Rehearsals are the key to all operations. My company conducted full scale rehearsals to include CSS, casualty evacuation, and vehicle recovery. These rehearsals coupled with a few, simple, battle drills allowed my element to react quickly to changes in the battlefield.	CPT, CO Cdr
In a war time environment do not try to mix civilian and military operations in order to accomplish a mission such as moving heavy equipment forward. Keep the two operations separate. Communication problems with Host Nation drivers.	CPT, Trans Grp CO Cdr
Decentralized control of platoons. Junior officer leadership took the initiative and significantly contributed to success of offensive operations. Field maintenance SOP, delegating responsibility down to site mechanics to maintain equipment. Due to dispersion of company, it was imperative these maintenance personnel executed the written SOP.	CPT, CO Cdr
Engineers desperately need new doctrine for mobility operations. Our focus in the past has been mainly to countermobility under a European Scenario. Doctrine must discuss breaching operations incorporating the new equipment of mine plows/rollers/rakes etc. SEEs must be kept on the Eng/TOE - all maneuver Cdrs used them to dig hasty positions whenever units halted.	MAJ, Eng Bde Bn XO
Units should train zero reaction time missions during CMTC or NTC rotations. This is the true test of if your SOP works. If your staff can put out the critical info in 10 minutes etc. I had never been under such time pressure while training for combat. It should be an ARTEP task.	CPT, Bn S-2

(continued on next page)

Table 46

Lessons Learned identified by survey respondents (continued)[a]

...NCOs need to be informed to be able to know what is going on. Lack of information leads to lack of motivation and second guessing and informed soldier is a motivated and prepared soldier.	SGT, Bn Legal NCO
Do not use non-standard fire support coordination measures such as a artillery deconfliction line, reconnaissance interdiction phase line.	MSG Div FSE Intel NCO
DO NOT combine RA w/USAR or NG units.	MSG Med Sup CO SGM
Managing personnel strength was faster and more effective using commercial computer systems (DOS/dBase). All units were able to obtain commercial systems while availability of TACCS was hindered.	MSG Pers Grp 1st SGT
Get the Reserve & National Guard new equipment. If the war would have lasted longer our fuel tankers & trucks wouldn't have lasted. Also when you are a GS unit you shouldn't be doing DS mission....The NCOs are not used effectively. They keep talking about NCOs taking charge but when we try we are stopped...Field grade and higher officers need to be more concerned with the young soldier...	SGM COSCOM Bn CSM
Senior NCOs and Junior NCOs were given the latitude to operate the TAC/ TOC, plan TAC/TOC moves and execute the running of their operations that freed the officers to do their missions in the operations of the TOC.	SFC, Ops NCOIC
Use of GPS receiver was useful, but to easy to become dependent on. Should be used as a tool for land navigation not a replacement.	SSG Eng Bde Recon SGT
Instead of a randomly prepared and formatted battle roster for each company or battery, a crew/team roster is much more accurate, timely, and appropriate for accounting for combat strength and casualty/replacement reporting.	SGT, PAC Sup
[a] See Appendices, pages A-12, B-11, and C-14 for the format of this question as presented to the respondents.	

In addition to the request for "lessons learned", the surveys also included a place for respondents to make any additional comments they felt were needed to provide a complete picture. Many commented on the survey itself, with the principal complaint being that it was too focused on combat, with too little opportunity for the EAC and CSS personnel to provide their feedback. A suggestion was made that seminars should be organized along branch lines to allow for pooling of information and the development of a consensus on BOS lessons learned. One respondent commented that we must be careful about what we take from Desert Storm. We will probably never experience more favorable conditions. Every war, every enemy, every theater is unique. Bad habits may be reinforced by our tremendous success in outcome.

A number of additional (positive and negative) comments were made on issues related to TO&Es, materiel, logistics, unit organization, and tactics.

Conclusions

The 2463 Army officers and enlisted personnel in our sample obviously took a great deal of time and effort responding to these surveys, providing what seem to be candid and often carefully reasoned answers and comments. The resultant database of opinions and observations was thoroughly described in this Overview, but in most cases the space and format limitations did not allow us to provide the reader with more than a glimpse of the material available. Given the level of detail of the analyses conducted to date, it is inappropriate to draw any general conclusions about the effectiveness of command and control or other aspects of Operation Desert Storm. There were several issues which received many comments. The concept of the Commanders Intent was strongly endorsed and the value of rehearsals was emphasized by many of our respondents. The supply and distribution systems, personnel evacuation and reporting systems, communications, and intelligence flow were frequently mentioned as problem areas. We expect that further more detailed analyses and reports by ARI, CALL, and other Army agencies will take advantage of the wealth of material available in the Desert Storm Survey database.

REFERENCES

Department of the Army (1986) Operations. FM 100-5.

Keene, S.D. and Halpin, S.M. (In preparation) How Well Did the CTCs Prepare Units for Combat? Questionnaire Results from Desert Storm Participants. ARI Technical Report 970. U.S. Army Research Institute for the Behavioral and Social Sciences.

APPENDIX A

DESERT STORM FIELD SURVEY FOR COMBAT AND COMBAT SUPPORT COMMANDERS

This Appendix contains a reproduction of one of the questionnaires distributed to Desert Storm participants. Note that the items in the questionnaire have been cross-referenced to the main body of this report. The entry T-12, for example, indicates that responses to the particular item are presented in Table 12 in this report. The entry P-32, for example, indicates that responses to the particular item are discussed in the text on page 32.

DESERT STORM FIELD SURVEY
FOR COMBAT AND COMBAT SUPPORT COMMANDERS

CENTER FOR ARMY LESSONS LEARNED

In accordance with AR 11-33, "Army Lessons Learned Program: System Development and Application", the Center for Army Lessons Learned (CALL) is tasked to collect lessons learned for the Army in peacetime and in war.

One of the ways that CALL is collecting information from the DESERT STORM operation is through this survey. Your participation is essential as a source of information. This survey is on a non-attribution basis and all information will be kept confidential. Please feel free to expand on any questions. All information that you can provide is important.

In accordance with the Privacy Act of 1974, your name is not required. However, you are encouraged to include it so that any follow-up issues may be resolved. Strict confidentiality will be maintained and your name will in no way be associated with the results of this survey.

Attach additional sheets for comments as required.

Background Information:

NAME (Optional)_____ RANK T-1

BRANCH/MOS _____ DIV OR SEPARATE BDE _____ TIME IN UNIT p-6

TYPE UNIT _____ DUTY POSITION T-2 TIME IN POSITION p-6

MONTH OF ARRIVAL IN SAUDI ARABIA _____

MILITARY SCHOOLING: OAC? _____ CAS3? _____ CGSC? _____ TCDC? _____

AWC? _____ Other? _____

NUMBER OF CTC ROTATIONS: BCTP? p-6 CMTC? _____ JRTC? _____ NTC? ____

PREVIOUS COMBAT EXPERIENCE: YES _____ NO _____ p-6

IF YES: VIETNAM _____ GRENADA _____ PANAMA _____ OTHER? _____

DESERT STORM EXPERIENCE:

_____ MY UNIT ACTIVELY FOUGHT
_____ MY UNIT WAS UNDER INDIRECT FIRE BUT DID NOT ACTIVELY FIGHT
_____ MY UNIT DID NOT RECEIVE FIRE

When completed send to: Deputy Commanding General for Training
Center for Army Lessons Learned, ATTN: ATZL-CTL
Ft. Leavenworth, KS 66027-7000

Survey Approval Authority: USAPIC
Control Number: ATNC-AO-91-38A, RCS:MILPC-3

Effectiveness in Combat Operations

1. How effective was each of the following factors in your operations?

	Low						High	
Reconnaissance	1	2	3	4	5	6	7	N/A
Counter reconnaissance T-3	1	2	3	4	5	6	7	N/A
Friendly deception operations	1	2	3	4	5	6	7	N/A
Deep ops, interdiction of 2nd enemy echelon	1	2	3	4	5	6	7	N/A
Deep ops, interdiction of enemy reserves	1	2	3	4	5	6	7	N/A
FASCAM in flank support	1	2	3	4	5	6	7	N/A
Logistics	1	2	3	4	5	6	7	N/A
Friendly indirect fire support	1	2	3	4	5	6	7	N/A
Close Air support	1	2	3	4	5	6	7	N/A
Suppression of enemy air defense	1	2	3	4	5	6	7	N/A
Other? _____ p 9-10	1	2	3	4	5	6	7	N/A

2. How disruptive to your operations was each of the following?

T-5

	Least						Most	
Enemy deception operations	1	2	3	4	5	6	7	N/A
Enemy direct fire	1	2	3	4	5	6	7	N/A
Enemy indirect fire	1	2	3	4	5	6	7	N/A
Enemy maneuvering on the battlefield	1	2	3	4	5	6	7	N/A
Chemical threat	1	2	3	4	5	6	7	N/A
Command Post displacement	1	2	3	4	5	6	7	N/A
Staff sleep loss and fatigue	1	2	3	4	5	5	7	N/A
Unit sleep loss and fatigue	1	2	3	4	5	6	7	N/A
Other? _____ T-6	1	2	3	4	5	6	7	N/A

3. What was the usefulness and application of higher commander's intent in your planning, preparation and execution?

T-8

4. Rate the effectiveness of the following IPB products:

	Low						High	
Battlefield Area Evaluation T-23	1	2	3	4	5	6	7	N/A
Terrain Analysis	1	2	3	4	5	6	7	N/A
Weather Analysis	1	2	3	4	5	6	7	N/A
Event Template	1	2	3	4	5	6	7	N/A
Decision Support Template	1	2	3	4	5	6	7	N/A
Other? _____	1	2	3	4	5	6	7	N/A

5. Did your unit receive adequate intelligence in preparation for combat operations? Yes No

T-23

Did PIR support commander's intent? Yes No

Describe any problems.

T-24

6. How were special operations forces integrated into your reconnaissance operations?

	Effectiveness in Combat Operations							
	Low						High	
7. How effective were:								
p 31-32								
Ground collection assets?	1	2	3	4	5	6	7	N/A
Air collection assets?	1	2	3	4	5	6	7	N/A

What collection systems was most effective for your unit?

8. How effective was the situational template? p-28 1 2 3 4 5 6 7 N/A

9. Was the current estimate process adequate p-15 Yes No

What techniques did you use to abbreviate it? T-9, T-10

10. How effective were your units rehearsals 1 2 3 4 5 6 7 N/A

Did they include (circle included elements): T-30

Maneuver (AR, IN, AV)
Reconnaissance
Fire Support
Air Defense
Engineers
Intelligence
Logistics
Other? _____

Any new rehearsal techniques? T-31

	Low					High		
11. How effective were your unit's ıttle drills:	1	2	3	4	5	6	7	N/A

T-30

What were the levels at which battle drills were conducted?

p-39

12. How did your task organization affect operations?

T-19

13. How were FA, EN, ADA, CSS, IEW, etc. task organized to support momentum in the attack?

T-19

14.	Were you able to mass fires upon initiation of combat?	Yes	No
	During the exploitation phase? T-33	Yes	No
	During pursuit?	Yes	No
15.	Was there sufficient <u>time</u> to accomplish all missions?	Yes	No
	Were there sufficient <u>assets</u> to accomplish all missions?	Yes	No
	Was there sufficient <u>support</u> to accomplish all missions?	Yes	No
16.	Did newly fielded equipment improve your operations?	Yes	No
17.	Were early warning nets established and maintained?	Yes	No
	Did early warning nets provide timely warning?	Yes	No

18. If you answered no to questions 14-17 provide details:

T-12

19. Was intelligence flow timely from higher to lower? Yes No
Lower to higher? Yes No

T-20

Was information received on friendly units Timely? Yes No
Accurate? Yes No
Complete? Yes No

Describe any problems and recommendations.

T-21, T-22

20. Describe communication problems encountered and how you worked around them.

T-27

21. During the attack, how did you deconflict contradictory information or reports on enemy and friendly units?

p-32

22. What were you able to accomplish with air superiority that wouldn't have been possible otherwise?

T-28

23. What coordination efforts were used with adjacent units and what were their effects on operations?

T-26

How were liaison officers used? Where did they come from?

p-34

24. What difficulties were encountered in visualizing the battlefield? What techniques were successful? Not successful?

p-18

T-13, T-14

25. Describe any major "surprises" that your previous experience at combat training centers did not prepare you for. (Example: casualties, weapon effectiveness, mobility, maintenance, commo, morale, etc.)

p-38

26. How did you shape the battlefield?

T-15

27. How did the rapid execution of the battle affect your flexibility?

T-18

28. Rank order these tasks from 1-10 where 1 is the most difficult task and 10 is the least difficult task.

T-7

_____ Completing tasks within the allotted time
_____ Dealing with uncertainty
_____ Synchronizing the operation
_____ Deciding a course of action
_____ Communicating concepts to subordinates
_____ Integrating staff operations
_____ Monitoring the execution
_____ Meeting higher's requirements
_____ Allocating own time and concentration
_____ Visualizing the battlefield

29. Describe techniques used to synchronize your operations and problems encountered during: p-20-21

Breaching operations

Attack of prepared positions

Exploitation

Pursuit

Integration of heavy and light forces

Control of indirect fire

Close, deep and rear operations

30. Rate the effectiveness of your organic weapons against:

	Effectiveness in Combat Operations Low → High							
Armored Personnel Carriers	1	2	3	4	5	6	7	N/A
Armor	1	2	3	4	5	6	7	N/A
Bunkers	1	2	3	4	5	6	7	N/A
Other? _____	1	2	3	4	5	6	7	N/A

Describe successes and failures.

31. What major functions were performed at each CP?

TAC

p-34-35

MAIN

REAR

32. How did Army Airspace Command and Control (A2C2) procedures affect your operations?

T-29

33. Which of the following limited your movement rate in deep operations?

Enemy actions	Yes	No
Mobility T-16	Yes	No
Supplies	Yes	No
Communications	Yes	No
Combat support units	Yes	No
Combat service support units	Yes	No
Casualty evacuation	Yes	No
EPWs	Yes	No
Refugees	Yes	No
Other? p-21	Yes	No

Describe how major limiting factors were overcome.

T-17

34. Was your logistic support adequate overall? T-37 Yes No

Was it positioned correctly for deep operations? Yes No

35. Was the combat PLL stockage adequate? Yes No

If no, what items?

36. Were controlled substitutions used? T-37 Yes No

If yes, who had the approval authority? _____

37. Rate the effectiveness of the following in your unit operations:

T-4

	Low						High	
Officer leadership	1	2	3	4	5	6	7	N/A
NCO leadership	1	2	3	4	5	6	7	N/A
Reserve component units	1	2	3	4	5	6	7	N/A
Handling of EPWs and refugees	1	2	3	4	5	6	7	N/A
Personnel evacuation procedures	1	2	3	4	5	6	7	N/A
Personnel replacement operations	1	2	3	4	5	6	7	N/A

38. How did your unit deal with MOUT operations?

39. How did wartime host nation support affect your operations?

p-45

40. What TDA equipment was used by your unit?

Due to identified mission requirements? T-37 Yes No

Identified TOE shortages? Yes No

Other? _____

List any identified TOE overages.

41. Did you use any new techniques or ideas that should be passed on as "Lessons Learned"?

T-46

42. Any additional comments?

APPENDIX B

DESERT STORM FIELD SURVEY FOR COMBAT SERVICE SUPPORT COMMANDERS

This Appendix contains a reproduction of one of the questionnaires distributed to Desert Storm participants. Note that the items in the questionnaire have been cross-referenced to the main body of this report. The entry T-12, for example, indicates that responses to the particular item are presented in Table 12 in this report. The entry P-32, for example, indicates that responses to the particular item are discussed in the text on page 32.

DESERT STORM FIELD SURVEY
FOR COMBAT SERVICE SUPPORT COMMANDERS

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In accordance with the Privacy Act of 1974, your name is not required. However, you are encouraged to include it so that any follow-up issues may be resolved. Strict confidentiality will be maintained and your name will in no way be associated with the results of this survey.

Attach additional sheets for comments as required.

Background Information:

NAME (Optional)_____ RANK T-1

BRANCH/MOS _____ DIV OR SEPARATE BDE _____ TIME IN UNIT p-6

TYPE UNIT _____ DUTY POSITION T-2 TIME IN POSITION p-6

MONTH OF ARRIVAL IN SAUDI ARABIA _____

MILITARY SCHOOLING: OAC? _____ CAS3? _____ CGSC? _____ TCDC? _____

AWC? _____ Other? _____

NUMBER OF CTC ROTATIONS: BCTP? p-6 CMTC? _____ JRTC? _____ NTC? _____

PREVIOUS COMBAT EXPERIENCE: YES _____ NO _____ p-6

IF YES: VIETNAM _____ GRENADA _____ PANAMA _____ OTHER? _____

DESERT STORM EXPERIENCE:

_____ MY UNIT ACTIVELY FOUGHT
_____ MY UNIT WAS UNDER INDIRECT FIRE BUT DID NOT ACTIVELY FIGHT
_____ MY UNIT DID NOT RECEIVE FIRE

When completed send to: Deputy Commanding General for Training
Center for Army Lessons Learned, ATTN: ATZL-CTL
Ft. Leavenworth, KS 66027-7000

Survey Approval Authority: USAPIC
Control Number: ATNC-AO-91-38B, RCS:MILPC-3

1. Rate the difficulty in supporting each of the following operations?

	Low					High		
Counter reconnaissance	1	2	3	4	5	6	7	N/A
Friendly deception operations	1	2	3	4	5	6	7	N/A
Deep operations	1	2	3	4	5	6	7	N/A
FASCAM in flank support	1	2	3	4	5	6	7	N/A
Friendly indirect fire support	1	2	3	4	5	6	7	N/A
Air operations	1	2	3	4	5	6	7	N/A
Suppression of enemy air defense	1	2	3	4	5	6	7	N/A
Other? _____	1	2	3	4	5	6	7	N/A

2. How disruptive to your operations was each of the following?

	Least					Most		
Enemy deception operations T-5	1	2	3	4	5	6	7	N/A
Enemy direct fire	1	2	3	4	5	6	7	N/A
Enemy indirect fire	1	2	3	4	5	6	7	N/A
Enemy maneuvering on the battlefield	1	2	3	4	5	6	7	N/A
Chemical threat	1	2	3	4	5	6	7	N/A
Command Post displacemnt	1	2	3	4	5	6	7	N/A
Staff sleep loss and fatigue	1	2	3	4	5	6	7	N/A
Unit sleep loss and fatigue	1	2	3	4	5	6	7	N/A
Other? _____ T-6	1	2	3	4	5	6	7	N/A

3. What was the usefulness and application of higher commander's intent in your planning, preparation and execution?

T-8

4. Rate the effectiveness of the following IPB products:

	Low					High		
Battlefield Area Evaluation	1	2	3	4	5	6	7	N/A
Terrain Analysis	1	2	3	4	5	6	7	N/A
Weather Analysis T-23	1	2	3	4	5	6	7	N/A
Event Template	1	2	3	4	5	6	7	N/A
Decision Support Template	1	2	3	4	5	6	7	N/A
Other? _____	1	2	3	4	5	6	7	N/A

5. Did your unit receive adequate intelligence in preparation for combat operations? Yes No

Did PIR support commander's intent? T-23 Yes No

Describe any problems. T-24

6. Did you receive adequate friendly information (lanes, mines, barriers, units, etc.) to conduct your operations? Yes No

If no, explain problems and how worked around them.

T-24

Effectiveness in Combat Operations

Low High

7. How effective was your unit in terrain management and MSR selection? 1 2 3 4 5 6 7 N/A

Describe problems.

8. How effective was the situational template? 1 2 3 4 5 6 7 N/A

9. Was the current estimate process adequate p-15 Yes No

What techniques did you use to abbreviate it?

T-9, T-10

10. How effective were your units rehearsals T-30 1 2 3 4 5 6 7 N/A

Did they include (circle included elements):

Combat Arms
Combat Support
Other? _____

Any new rehearsal techniques? T-31

11. How effective were your unit's battle drills: 1 2 3 4 5 6 7 N/A

What battle drills had the highest payoff?

12. How did your CSS task organization affect operations?

T-19

13. Describe any logistical weaknesses that threatened mission accomplishment.

14. How were FA, EN, ADA, IEW, etc. task organized to support CSS operations?

T-19

15. Was there sufficient time to accomplish all missions? Yes No

Were there sufficient assets to accomplish all missions? Yes No

Was there sufficient support to accomplish all missions? Yes No

16. Did newly fielded equipment improve your operations? Yes No

17. Were early warning nets established and maintained? Yes No

Did early warning nets provide timely warning? Yes No

18. If you answered no to questions 15-17 provide details:

T-12

19. Was intelligence flow timely from higher to lower? Yes No

Lower to higher? Yes No

T-20

Was information received on friendly units Timely? Yes No

Accurate? Yes No

Complete? Yes No

Describe any problems and recommendations.

T-21, T-22

20. Describe communication problems encountered and how you worked around them.

T-27

21. How was security provided for in support operations?

22. Describe the logistic needs of EPW operations.

23. How did you deconflict contradictory information or reports on enemy and friendly units?

p-32

24. What were you able to accomplish with air superiority that wouldn't have been possible otherwise?

T-28

25. How difficult was it to establish and maintain FARPs?

26. What coordination efforts were used with adjacent units and what were their effects on operations?

T-26

How were liaison officers used? Where did they come from?

p-34

27. What difficulties were encountered in visualizing the battlefield? What techniques were successful? Not successful?

p-18

T-13, T-14

28. Describe any major "surprises" that your previous experience at combat training centers did not prepare you for. (Example: casualties, weapon effectiveness, mobility, maintenance, commo, morale, etc.)

p-38

29. How did the rapid execution of the battle affect your flexibility?

30. Rank order these tasks from 1-10 where 1 is the most difficult task and 10 is the least difficult task.

_____ Completing tasks within the allotted time
_____ Dealing with uncertainty
_____ Synchronizing the operation
_____ Deciding a course of action
_____ Communicating concepts to subordinates
_____ Integrating staff operations
_____ Monitoring the execution
_____ Meeting higher's requirements
_____ Allocating own time and concentration
_____ Visualizing the battlefield

31. How did Army Airspace Command and Control (A2C2) procedures affect your operations?

T-29

32. Which of the following limited your movement rate in deep operations?

Enemy actions		Yes	No
Mobility		Yes	No
Supplies		Yes	No
Communications	T-16	Yes	No
Combat support units		Yes	No
Combat service support units		Yes	No
Casualty evacuation		Yes	No
EPWs		Yes	No
Refugees		Yes	No
Other? _____	p-21	Yes	No

Describe how major limiting factors were overcome.

T-17

33. What supply class was the most difficult to supply? Why?

p-45

34. Were EOD functions supported during operations? Yes No

Describe problems and recommendations.

T-45

35. What problems did you have supporting fast moving operations?

p-45

36. Was the combat PLL stockage adequate? T-37 Yes No

If no, what items?

37. Were controlled substitutions used? Yes No

T-37

If yes, who had the approval authority? _____

38. Rate the effectiveness of the following in your unit operations:

T-4

	Low						High	
Officer leadership	1	2	3	4	5	6	7	N/A
NCO leadership	1	2	3	4	5	6	7	N/A
Reserve component units	1	2	3	4	5	6	7	N/A
Handling of EPWs and refugees	1	2	3	4	5	6	7	N/A
Personnel evacuation procedures	1	2	3	4	5	6	7	N/A
Personnel replacement operations	1	2	3	4	5	6	7	N/A

39. How did wartime host nation support affect your operations?

p-45

40. What TDA equipment was used by your unit?

Due to identified mission requirements? T-37 Yes No

Identified TOE shortages? Yes No

Other? _____

List any identified TOE overages.

41. Did you use any new techniques or ideas that should be passed on as "Lessons Learned"?

T-46

42. Any additional comments?

APPENDIX C

DESERT STORM FIELD SURVEY FOR STAFFS

This Appendix contains a reproduction of one of the questionnaires distributed to Desert Storm participants. Note that the items in the questionnaire have been cross-referenced to the main body of this report. The entry T-12, for example, indicates that responses to the particular item are presented in Table 12 in this report. The entry P-32, for example, indicates that responses to the particular item are discussed in the text on page 32.

DESERT STORM FIELD SURVEY
FOR STAFFS

CENTER FOR ARMY LESSONS LEARNED

In accordance with AR 11-33, "Army Lessons Learned Program: System Development and Application", the Center for Army Lessons Learned (CALL) is tasked to collect lessons learned for the Army in peacetime and in war.

One of the ways that CALL is collecting information from the DESERT STORM operation is through this survey. Your participation is essential as a source of information. This survey is on a non-attribution basis and all information will be kept confidential. Please feel free to expand on any questions. All information that you can provide is important.

In accordance with the Privacy Act of 1974, your name is not required. However, you are encouraged to include it so that any follow-up issues may be resolved. Strict confidentiality will be maintained and your name will in no way be associated with the results of this survey.

Attach additional sheets for comments as required.

Background Information:

NAME (Optional)_____ RANK T-1

BRANCH/MOS _____ DIV OR SEPARATE BDE T-2 TIME IN UNIT _____

TYPE UNIT _____ DUTY POSITION _____ TIME IN POSITION _____

MONTH OF ARRIVAL IN SAUDI ARABIA _____

MILITARY SCHOOLING: OAC? _____ CAS3? _____ CGSC? _____ TCDC? _____

AWC? _____ Other? _____

NUMBER OF CTC ROTATIONS: BCTP? _____ CMTC? _____ JRTC? _____ NTC? ____

PREVIOUS COMBAT EXPERIENCE: YES _____ NO _____ p-6

IF YES: VIETNAM _____ GRENADA _____ PANAMA _____ OTHER? _____

DESERT STORM EXPERIENCE:

_____ MY UNIT ACTIVELY FOUGHT
_____ MY UNIT WAS UNDER INDIRECT FIRE BUT DID NOT ACTIVELY FIGHT
_____ MY UNIT DID NOT RECEIVE FIRE

When completed send to: Deputy Commanding General for Training
Center for Army Lessons Learned, ATTN: ATZL-CTL
Ft. Leavenworth, KS 66027-7000

Survey Approval Authority: USAPIC
Control Number: ATNC-AO-91-38C, RCS:MILPC-3

1. How disruptive to your operations was each of the following?

T-5

	Least						Most	
Enemy deception operations	1	2	3	4	5	6	7	N/A
Enemy direct fire	1	2	3	4	5	6	7	N/A
Enemy indirect fire	1	2	3	4	5	6	7	N/A
Enemy maneuvering on the battlefield	1	2	3	4	5	6	7	N/A
Chemical threat	1	2	3	4	5	6	7	N/A
Command Post displacement	1	2	3	4	5	6	7	N/A
Staff sleep loss and fatigue	1	2	3	4	5	6	7	N/A
Unit sleep loss and fatigue	1	2	3	4	5	6	7	N/A
Other? _____ T-6	1	2	3	4	5	6	7	N/A

2. What was the usefulness and application of commander's intent in your planning, preparation, and execution?

T-8

	Effectiveness in Combat Operations							
	Low						High	
3. Effectiveness of the following IPB products:								
Battlefield Area Evaluation	1	2	3	4	5	6	7	N/A
Terrain Analysis	1	2	3	4	5	6	7	N/A
Weather Analysis T-23	1	2	3	4	5	6	7	N/A
Event Template	1	2	3	4	5	6	7	N/A
Decision Support Template	1	2	3	4	5	6	7	N/A

4. Did your unit receive adequate intelligence in preparation for combat operations? Yes No

Did PIR support commander's intent? T-23 Yes No

Describe any problems. T-24

5. How effective was the situational template? 1 2 3 4 5 6 7 N/A

6. Was the current estimate process adequate? p-15 Yes No

What techniques did you use to abbreviate it? T-9, T-10

7. Did orders give you adequate time to prepare for operations? T-11 Yes No

If no, explain problems.

T-12

	Low						High	
8. Rate the effectiveness of your unit's rehearsals: T-30	1	2	3	4	5	6	7	N/A

What new rehearsal techniques did you use?

T-31

9. How were FA, EN, ADA, CSS, IEW, etc. task organized to support momentum in the attack?

T-19

10. Did control measures ensure cooperation between forces? Yes No

Were they too restrictive to subordinates? p-32 Yes No

Describe any difficulties.

11. Were you able to mass fires during the initiation of combat? Yes No

During exploitation phase? T-33 Yes No

During pursuit? Yes No

12. Was there sufficient time to accomplish all missions? T-11 Yes No

Were there sufficient assets to accomplish all missions? T-11 Yes No

Was there sufficient support to accomplish all missions? T-11 Yes No

13. Did newly fielded equipment improve your operations? Yes No

14. Were early warning nets established and maintained? Yes No

Did early warning nets provide timely warning? Yes No

15. If answered no to questions 11-14 provide details:

16. Was intelligence flow timely from higher to lower? Yes No
Lower to higher? Yes No

T-20

Was information received on friendly units progress Timely? Yes No
Accurate? Yes No
Complete? Yes No

Describe any problems in tracking friendly units' progress.

T-21, T-22

17. Describe communication problems encountered and how you worked around them.

T-27

18. During the attack, how did you deconflict contradictory information or reports on enemy and friendly units?

p-32

19. What coordination efforts were used with adjacent units and what were their effects on operations?

T-26

Where did liaison officers come from (out of hide, overstrength, etc) and how were they used?

p-34

20. Describe any major "surprises" that your previous experience at combat training centers did not prepare you for. (Example: casualties, weapon effectiveness, mobility, maintenance, commo, morale, etc.)

p-38

21. What techniques did you use to synchronize your operations and what problems did you encounter?

p-20-21

22. In your staff area, what major staff functions were performed at each CP?

TAC

MAIN p-34-35

REAR

	Effectiveness in Combat Operations							
23. How effective were your organic weapons against:	Low						High	
T-32								
Armor	1	2	3	4	5	6	7	N/A
Bunkers	1	2	3	4	5	6	7	N/A
Armored Personnel Carriers	1	2	3	4	5	6	7	N/A
Other? _____	1	2	3	4	5	6	7	N/A

Describe successes and failures.

24. Which of the following limited your movement rate in deep operations?

Enemy actions	Yes	No
Mobility T-16	Yes	No
Communications	Yes	No
Combat support units	Yes	No
Combat service support units	Yes	No
Casualty evacuation	Yes	No
EPWs	Yes	No
Refugees	Yes	No
Other _____ p-21		

Describe how major limiting factors were overcome:

T-17

25. Was your logistics support adequate overall? T-37 Yes No

Was it positioned correctly for deep operations? Yes No

26. Was the combat PLL stockage adequate? Yes No

If no, what items? _____

27. Were controlled substitutions used? Yes No

If yes, who had approval authority? _____

28. Identify the effectiveness of the following in your unit's operations:

T-4	Low						High	
Officer leadership	1	2	3	4	5	6	7	N/A
NCO leadership	1	2	3	4	5	6	7	N/A
Reserve component units	1	2	3	4	5	6	7	N/A
Handling of EPWs and refugees	1	2	3	4	5	6	7	N/A
Personnel evacuation procedures	1	2	3	4	5	6	7	N/A
Personnel replacement operations	1	2	3	4	5	6	7	N/A

29. How did wartime host nation support affect your operations?

p-45

30. What TDA equipment was used by your unit?

Due to identified mission requirements? Yes No
Identified TOE shortages? Yes No
Other? _____

List any identified TOE overages.

Maneuver

31. Give examples of control procedures used during battle (good and bad).

32. How effective were land navigation techniques?

	Effectiveness in Combat Operations							
	Low						High	
During daylight operations	1	2	3	4	5	6	7	N/A
During night operations	1	2	3	4	5	6	7	N/A

Describe any new techniques used.

33. How effective were fire control measures?

During daylight operations	1	2	3	4	5	6	7	N/A
During night operations	1	2	3	4	5	6	7	N/A

Describe any problem areas.

Intelligence

34. Did the IPB turn out to be accurate? Yes No

Recommended improvements.

35. What reconnaissance methods gave the best 'real time' information?

36. How effective were psychological operations (PSYOPs)?

p-44

37. Rate the effectiveness of EPW information:	Low						High	
Gathering of information	1	2	3	4	5	6	7	N/A
Usefulness of information	1	2	3	4	5	6	7	N/A

Describe the problem areas.

Mobility, Countermobility, Survivability

38. Assess the reliability of mines, fuses, and demolitions in the desert.

39. What was the most effective techniques used to construct survivability positions in the desert?

40. Assess the integration of engineer units into the reconnaissance effort.

41. What was the most effective obstacle breaching technique?

What was the best technique used to improve lanes?

42. Were EOD functions adequately supported during combat operations?

Describe problems and recommendations.

T-45

Fire Support

43. Rate the effectiveness of fire support:

	Low						High	
Decide, detect, and deliver system	1	2	3	4	5	6	7	N/A
Identification of high payoff targets	1	2	3	4	5	6	7	N/A

p-41-42

Describe problem areas.

T-34

44. How frequently did artillery units make survivability moves?

45. What methods of survey were most effective in supporting the artillery units? Include techniques used and level of coordination required.

46. Where were FSOs and FSCOORDs during the battle?

What C2 problems did they encounter?

T-35

ADA

47. Were ADA priorities correctly identified and executed? Yes No

Describe problems and recommendations. p-43

T-36

48. Were there IFF problems? p-43 Yes No

Describe difficulties. T-36

49. How is your early warning system organized?

CSS

50. Were there sufficient assets to support the method of supply distribution to units? Yes No

p-46

If no, how were the problems overcome?

51. Describe security measures for resupply operations to forward elements.

52. Rate the quality of the following: T-38

	Low						High	
Command battle damage estimate	1	2	3	4	5	6	7	N/A
Maintenance failure estimate	1	2	3	4	5	6	7	N/A
Expected workload estimate	1	2	3	4	5	6	7	N/A
Supply distribution system	1	2	3	4	5	6	7	N/A
Support to heavy/light task forces	1	2	3	4	5	6	7	N/A
Interservice CSS support	1	2	3	4	5	6	7	N/A
Multi-national CSS support	1	2	3	4	5	6	7	N/A
Numbers of Army motor transport assets	1	2	3	4	5	6	7	N/A

Describe the problem areas and recommended solutions.

53. Were there any specific circumstances when CSS personnel were injured, wounded or killed where training deficiencies may have contributed?

54. Were injured or wounded personnel individually tracked upon entering the medical treatment system? T-39 Yes No

Were all levels of command provided adequate casualty information? Yes No

Describe problems and recommendations T-41

55. Was the medical evacuation system prepared to handle anticipated casualties? T-39 Yes No

Did EPWs create any burden on the casualty vacuation system? Yes No

Describe problems and recommendations

T-42

56. What communications equipment was most effective? Were re any identified shortages? How did these affect your operations?

T-27

57. What major communication equipment problems were encountered?

Describe problems and recommendations.

T-27

58. What problems did you have networking your communication equipment to other units? Recommendations for improvements?

T-27

59. Were MP patrols used on MSRs? T-43 Yes No

With convoys? Yes No

Others? _____

Describe problems.

60. Were MPs sufficiently equipped to process EPWs? Yes No

T-43

Were problems encountered in handover of EPWs from capturing units to the MPs? Yes No

Was there sufficient coordination between the Movement Control Center and the MPs? Yes No

Explain problem areas.

T-44

61. Did you use any new techniques or ideas that should be passed on as "Lessons Learned"?

T-46

62. Did the tasks and standards in the Soldiers Manual match combat requirements? Yes No

Recommended improvements?

63. Additional comments?