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COMBAT OPERATIONAL DATA ANALYSIS  
AN EXAMINATION OF WORLD WAR II SUPPRESSION DATA

TECHNICAL REPORT



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AN EXAMINATION OF WORLD WAR II SUPPRESSION DATA

TECHNICAL REPORT

February 28, 1989

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STUDY GIST - COMBAT OPERATIONAL DATA ANALYSIS  
AN EXAMINATION OF WORLD WAR II SUPPRESSION DATA

PRINCIPAL FINDINGS

The data collected, compiled, and evaluated in this study were:

- o Inadequate, in its original form, for modeling suppressive effects of bombardment or judging model results in division and theater level models.
- o Adequate for initial efforts to develop hypotheses and to identify focused data collection requirements.

MAIN ASSUMPTIONS

The main assumptions of this study were:

- o Data describing suppression, or the parameters and effects of bombardment, are important in developing realistic scenarios for combat simulation models.
- o Data of this type was available in numerous combat operational reports created by military personnel and operations researchers in the United Kingdom during World War II.
- o This data should be collected, compiled, and preserved in a format useful in the development of realistic combat simulation models.

PRINCIPAL LIMITATIONS

The intent of this study was not to develop a specific definition of suppression, to develop or test specific hypotheses, or to develop algorithms which would incorporate the effects of suppressive fire into current combat models.

SCOPE OF EFFORT

The scope of this study was to determine what data were readily available, to collect that data, and to organize that data for further analysis, evaluation, and use in the development of realistic combat simulation models.

OBJECTIVE

The objective of this study was to compile, reduce, and analyze data from existing operational analysis reports generated during World War II in order to provide (1) source data for modeling suppression effects due to fire support in division and theater level combat simulation models and (2) to benchmark or develop approximate standards against which to judge artillery expenditure results from division and theater level models.

BASIC APPROACH

Data were abstracted from British World War II operational data reports dealing with the subject of suppression by Professor R. W. Shephard of the United Kingdom's Centre for Operational Research and Defence Analysis (CORDA). These data were combined by SAIC with similar data compiled by Professor Shephard for the Human Engineering Laboratory (HEL) in 1987. The resulting data set was recorded in a three-tiered data base designed to provide an initial means to evaluate the usefulness of the data for modeling suppression in US combat models. A preliminary analysis of the data was accomplished.

REASON FOR PERFORMING THE STUDY

Recent Army interest in the importance of the human dimension in combat modeling led to the exploration of new ways of including more operational realism in combat modeling. This study contributes to these efforts by making a detailed examination of data available on the suppressive effects of bombardment.

IMPACT OF THE STUDY

The data base created in this study will provide an analytical tool which will assist in the initial development of hypotheses and mathematical models of the effect of suppressive bombardments on the combat effectiveness of units subjected to indirect fire bombardment.

SPONSOR

US Army Concepts Analysis Agency

PRINCIPAL INVESTIGATOR

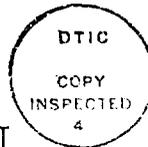
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## SECTION 1

### INTRODUCTION

As part of its operational force and weapons planning tasks, the US Army uses division and theater-level simulation models to project wartime combat scenarios. Because of the significance of the decisions which the Army makes based upon the results of combat simulation modeling, the validity of combat simulation results is always an issue and efforts to improve the reality of combat models are on-going continually.

Combat is the struggle between opposing forces so that the will of one force may be imposed upon the other. Undoubtedly, the earliest combat was simply a hand-to-hand fight between individuals armed only with weapons like sticks and rocks provided by nature. Although man's ingenuity and technological advances have, over the centuries, allowed him to develop sophisticated weapons which often require only minimal input from the individual, the human element of combat remains essential. Combat modeling, however, has tended to focus on the purely physical effects of weapons with only indirect or implied human performance being included. Recently the Army, as well as the other Services, has stressed the importance of the human dimension in combat modeling and has explored new ways of including more operational realism in combat modeling. This study contributes to these efforts by making a detailed examination of the data available on the suppressive effects of bombardment.

#### 1.1 BACKGROUND

Interest in human performance under fire is not new. The suppressive effects of artillery, aerial, and naval gunfire attacks have been formally investigated for over forty years.

During World War II the United Kingdom, recognizing the need for scientific assistance for their operational commands, created Operational Research (OR)

Groups as a part of British forces stationed both in England and overseas. These OR Groups collected measurements on the tactical performance and battlefield effectiveness of weapons, both Allied and German. The amount of data collected was quite extensive, and included correlations between rates of advance and casualties suffered; strength of opposition; damage to structures and personnel resulting from bombing; material and morale effects of bombardment; and, accuracy and lethality of ground and air weapons. Scientists of varied academic disciplines assigned to these small groups regularly gathered specific information on the effects of suppressive attacks by artillery, naval gunfire, and aviation attacks upon enemy targets.

Numerous reports, written immediately following various engagements, contain much quantitative information not normally found in operational reports created by military personnel. The principal value of these reports is their attention to quantitative detail. The scientific methods used for collection make the data adaptable for use in mathematical models. Prior to this study a portion of these data had been compiled by Professor Ronald W. Shephard of the United Kingdom's Centre for Operational Research and Defence Analysis (CORDA) for the Human Engineering Laboratory (HEL), Aberdeen Proving Ground. Examination of this data indicated a hopeful prospect of extracting information for application to US Army combat simulation modeling.

The British, however, are not the only ones to have done research into the effects of artillery. Suppressive effects of artillery fire have also been estimated for use in models by Fort Sill. Numerous experiments, including several by the Army's Combat Developments Experimentation Command (CDEC), over the past twenty years have addressed suppression's impact upon combat performance. Additionally, the Army Research Institute (ARI) has conducted experiments to assess the impact of small arms upon human performance. Since many of these reports cite earlier works completed during or shortly after World War II in the United Kingdom, the importance of the early British work cannot be overstated.

## 1.2 UNDERSTANDING THE PROBLEM

There are inherent problems in assessing force effectiveness by using combat simulation models. Data describing suppression, or the parameters and effects of bombardment, are important in developing a realistic casualty scenario for a simulation. Data currently used in these descriptions are either lacking entirely or are not easily validated since there has been no benchmark data available with which to relate simulation results to historical events. Data on the characteristics and effects of suppression need to be collected, compiled and analyzed in order to improve and enhance the effectiveness of division and theater-level simulation models and provide more confidence in the results.

Historically, the US Army has not stressed collecting and analyzing human performance data and their effect within the battlefield environment or on the battle outcome. It has long been obvious that suppression effects and human performance factors are highly correlated. There is a renewed interest in determining what this correlation is, how predictions of human performance can influence suppression and casualty modeling in combat simulations, and how to actually incorporate suppression effects in the simulation models being used.

## 1.3 STUDY OBJECTIVES

The Government, on 28 June 1988, requested that Science Applications International Corporation (SAIC) begin work on a study of World War II combat operational data. The Government issued Task Order Number 5, under Contract MDA903-88-D-1000, to achieve the objective shown below:

To compile, reduce, and analyze data from existing operational analysis reports generated during World War II in order to provide (1) source data for modeling suppression effects due to fire support in division and theater level models and (2) to benchmark or develop approximate standards against which to judge artillery expenditure results from division and theater level models.

The US Army Concepts Analysis Agency (CAA), the study sponsor, assigned Dr. Robert Helmbold as the Technical Representative for the study. SAIC assigned

Mr. Brian McEnany as the Principal Investigator for the effort. Partway through the study, Mr. Charles Frame replaced Mr. McEnany, who continued to be associated with the effort as an analyst. SAIC further contracted with CORDA for the services of Professor Shephard. The Government Statement of Work is presented as Appendix B.

The intent of this study was not to develop a specific definition of suppression, to develop or test hypotheses, or to develop algorithms which would incorporate the effects of suppressive fires into current combat models. The essence of this effort was to attempt to determine what data were readily available, collect them, and organize them for further analysis and evaluation. As the study progressed, In-Process Reviews were conducted and the effort focused on the following questions asked by the Government:

- o What data are available in the CORDA collection?
- o What can be done with the data as they exist?
- o What use can be made of the data for modeling?
- o What lessons can be learned from the process?
- o What direction should future work take?

The answers to these questions, in response to the Statement of Work, are found in the sections that follow.

---

For a discussion of the definition of suppression see Appendix A.

## SECTION 2

### METHODOLOGY OVERVIEW

In order to compile, reduce, and analyze World War II operational data to achieve the study objectives stated in the Government Statement of Work at Appendix B and discussed in the previous section of this report, SAIC established a technical approach composed of the four basic tasks summarized below.

#### 2.1 DATA COLLECTION

In 1987, Professor Shephard of CORDA extracted data describing the suppressive effects of artillery and aerial attacks on enemy targets from reports originally created by British Operations Research Units during and immediately after World War II. Those data, collected under contract for the HEL at Aberdeen Proving Ground and compiled in a two volume set titled "A Survey of Suppression," formed the initial data set for this study.

In 1988, Professor Shephard, under subcontract to SAIC, extracted additional data from the original set of reports to supplement those already available Volumes I and II data. These data were recorded in two additional volumes which became Volumes III and IV of the "A Survey of Suppression" set. This data collection effort, conducted specifically for the present study, is explained in detail in Section 3.

#### 2.2 DATA DESCRIPTION

The data in Volumes I through IV of the "Survey of Suppression" set were recorded in a format conducive to data analysis during this study and any subsequent efforts. A three-tier data base structure using dBASE III PLUS software was used for this purpose. During this part of the study all data provided by Professor Shephard were subjected to detailed examination for the purpose of identifying the set of variables which would completely describe each

operational engagement. These variables were then categorized as either: identification data, serial data, target data, firing data, results data, or calculated data. These data categories provided the building blocks for structuring of the data base, as explained in Section 4.

### 2.3 DATA BASE DEVELOPMENT

The primary purpose of the data base is to enhance the usefulness of the CORDA data by recording the data as recorded in British Operational Reports and extracted by Professor Shephard. The data base was developed to ensure that all operational data pertinent to the identification and measurement of suppression effects were recorded. Data were recorded in the data base without enhancement by interpretation, that is, exactly as reported in the CORDA volumes. Thus the data base provided a tool for conducting a preliminary evaluation of the usefulness of the original data. The data base development effort is explained in detail in Section 5.

### 2.4 DATA EVALUATION

Data evaluation focused on answering three of the five questions identified in Section 1.3 of this report, namely:

- o What data are available in Volumes I-IV of the CORDA reports?
- o What can be done with the data?
- o What use can be made of the data for modeling?

Of course data evaluation was not done exclusively in this part of the study. The description of the data in preparation for the structuring of the data base also contributed significantly to the understanding and evaluation of the data. The evaluation of data recorded in the data base concentrated on describing the density and location of data within the data base and estimating the number of data points available for estimating functional relationships between key variables. The data evaluation effort is explained in detail in Section 6.

## SECTION 3

### DATA COLLECTION

This section describes the process of collecting and compiling information on World War II combat operations. Section 3.1 identifies the data sources, while Section 3.2 discusses the format used to record the data. Finally, Section 3.3 presents some of the difficulties and limitations encountered during this phase of the study.

#### 3.1 SOURCES

The source of information for the data evaluated by SAIC was a four volume set of abstracts compiled by Professor Shephard and his principal researcher. They were created by defining a framework for data collection, reviewing and cross-checking the original sources of data in the United Kingdom repositories (especially the Public Records Office), and creating a bombardment analysis sheet for each engagement.

Professor Shephard had previously compiled an annotated bibliography of a large number of the nearly 3000 operations research reports created by the United Kingdom's Operational Research Groups during World War II. Research conducted for HEL in 1987 produced a smaller bibliography of to 75 reports which addressed suppression effects. These reports are listed in Appendix C.

This smaller bibliography was further broken into two distinct parts. Category A contains reports for a number of operations in Germany, Italy, and various Pacific islands. The size of the operations were from squad to corps and some reports had subreports due to the length or duration of the operation. These reports included data extracted by the OR groups on suppressive effects of bombardment by artillery, naval gunfire, and aircraft.

Category B reports document efforts by OR personnel back in England to extrapolate the earlier findings and create models or estimates of the effects

on human performance. There were a small number of these still in the United Kingdom repositories.

The effort sponsored by HEL in 1987 concentrated upon the Category A reports. The SAIC effort, somewhat constrained by resources, continued data collection from the Category A bibliography list at Appendix C. It was thought that papers in this Category would be of most interest initially, and that they should be dealt with before those in Category B (which rely mainly upon papers in Category A for basic data). The Government elected to request selected Category B reports from the UK. Three of the eight reports requested were received at the end of the current contract period, too late for use during the study. They are expected to contain some hypotheses concerning the important parameters associated with the evaluation of suppressive data at the end of World War II, and so could be of use in future hypothesis development efforts.

SAIC and Professor Shephard agreed with the Government that additional data collection of United Kingdom operational data would greatly assist in preserving important information before it is lost. The Government wished to pursue collecting as much information related to suppression from these documents as possible. Hence, Professor Shephard continued extracting bombardment data from the operational reports within the resources allowed for data collection in this study effort.

### 3.2 FORMAT

The terms of reference for the HEL study asked for abstracts to be prepared of each report or document listed. For the sake of uniformity, each abstract, referred to as a Serial, follows a standard format (as far as circumstances will allow) and records the following details:

- o The location and date of the action, a map of the area, and the reference from which the data have been abstracted,
- o A description of the plan for the action and the enemy dispositions,
- o Details of the bombardment including the units involved, the targets engaged, and the program (i.e., schedule) of fire.

- o A note on any factors that might have influenced the effect of the bombardment,
- o Casualties to both sides and observations on suppressive effects noted at the time or obtained from interviews afterwards, and,
- o A Bombardment Analysis Sheet giving numbers of rounds fired, density of bombardment, duration of fire, etc., where known.

Each abstract has its own serial number which appears in the top right-hand corner of the sheet. As has been mentioned, some serials contain details of more than one bombardment. Serial 10, for example, contains reports of ten separate actions. Figure 3-1 provides an example of Report 8 of Serial 10 and includes two pages of narrative describing the action and a two page Bombardment Analysis Sheet (BAS) providing tabular data on the bombardment.

A total of twenty-six abstracts (serials) were reported by Professor Shephard in his work for HEL. These serials are recorded in a two volume set titled "A Survey of Suppression". Figure 3 1 is an example from Volume I of this set, henceforth referred to as CORDA Volume I or simply Volume I. The format demonstrated in Figure 3-1 was developed during the HEL work and was continued in the two additional volumes (CORDA Volumes III and IV) which Professor Shephard prepared specifically for this study. Volumes III and IV, which are bound separately, are listed as Appendices of this report and were provided to CAA with this report. The Figure 3-1 example was chosen, although it is from Volume I, because it provides good opportunities to discuss data limitations (Section 3.3) and the process of recording the data in the data base (Section 5).

This study evaluated the data in all four volumes of the "A Survey of Suppression" set. Data evaluation and the data base created to assist in the data evaluation are discussed in subsequent sections of this report.

<u>CONTINUATION SHEET</u>		
<u>LOCATION</u> Italy	<u>DATE</u>	<u>SERIAL</u> 10
<u>REPORT 8</u>		
1. <u>SCENARIO</u>		
1.1 <u>General</u>		
H hour was 2300 hrs.		
1.2 <u>The British plan</u>		
Artillery was to support an attack on a hill top by (hopefully) persuading the Germans to evacuate their positions. A "crash and harass" plan was adopted. (The "crashes" would seem to be short intense periods of fire).		
1.3 <u>The German dispositions</u>		
The German positions were on a hill top.		
1.4 <u>The attack</u>		
The position was strongly defended by MG fire when the infantry advanced after the bombardment.		
2. <u>ARTILLERY BOMBARDMENT</u>		
2.1 <u>Supporting units</u>		
Three field regiments, one medium regiment, and one heavy battery were used.		
2.2 <u>The artillery programme</u>		
Generally the programme was as follows. Each troop was allocated a target. Three of these targets were on the position to be assaulted, the rest were supposed to be suppressed.		
These targets were engaged in the following time table. (Note that the shelling by the heavy battery was not recorded).		

FIGURE 3-1. CORDA ABSTRACT FORMAT

CONTINUATION SHEET

LOCATION Italy

DATE

SERIAL NO

<u>Start</u>	<u>Stop</u>	<u>rpg. (Fd)</u>	<u>rpg. (Med).</u>
H-60 (Crash)		6	3
H-60	H-30	20	10
H-25	H-15	12	6
H-14 (Crash)		4	2
H (Crash)		10	5
H-5	H+30	20	10
H+30	H+60	15	8 (15 on objective)
<hr/>			
H+60	H+85	15	7
H+90 (Crash)		5	3
H+95	H+180	40	20
H+180	H+420	30	15 (single rounds spread over time).

After H+60 fire refers to subsidiary targets. Fire was by prediction.

2.3 Distribution of fire

The artillery fire seemed to be widely scattered over an area of 2,500 yards by 6,000 yards.

3. OTHER FACTORS

None.

4. CASUALTIES

Not known.

5. CONCLUSION

The position was not suppressed at the time of the infantry attack.

FIGURE 3-1. CORDA ABSTRACT FORMAT (CONTINUED)

<u>LOCATION</u> Italy		<u>BOMBARDMENT ANALYSIS SHEET</u>						<u>SERIAL NO</u>
		<u>DATE</u>						
<p>(It has been assumed that the 7.2in howitzers fired at half the rate of the 5.5in guns. It has also been assumed that the 3 troops firing at the objective were 2 field troops and 1 medium troop).</p>								
<u>THE OBJECTIVE</u>								
TIME (from - to)	BARRAGE TYPE	25pr			5.5in			Total Rounds 25pr + 5.5in
		No of Guns	rp8	Fuze Rds fired	No of Guns	rp8	Fuze Rds fired	
H-60		8	6	48	4	3	12	60
H-60 to H-30		8	20	160	4	10	40	200
H-25 to H-15		8	12	96	4	6	24	120
H-14		8	4	32	4	2	8	40
H		8	10	80	4	5	20	100
H+5 to H+30		8	15	120	4	15	40	200
H+30 to H+60		8	20	120	4	10	60	180
<b>TOTAL DURATION</b> 90 min		<b>TOTAL RDS</b>		<b>696</b>	<b>TOTAL RD§</b>		<b>204</b>	<b>TOTAL 900</b>
<u>Target Area</u>	1,875,000 yd <sup>2</sup> (estimated by abstractor)							

FIGURE 3-1. CORDA ABSTRACT FORMAT (CONTINUED)

<u>LOCATION</u> Italy	<u>BOMBARDMENT ANALYSIS SHEET</u>	<u>SERIAL NO</u>
	<u>DATE</u>	
	<u>Average Density</u>	
25pr:	0.000371 rds/yd <sup>2</sup> - 0.00928 lb/yd <sup>2</sup> in 120 min	
5.5in:	0.000109 rds/yd <sup>2</sup> - 0.00870 lb/yd <sup>2</sup> in 120 min - 0.00722 lb/yd <sup>2</sup> equiv 25pr (Factor = 0.830)	
Total	0.000480 rds/yd <sup>2</sup> in 120 min - 0.0180 lb/yd <sup>2</sup> actual wt in 120 min - 0.0165 lb/yd <sup>2</sup> equiv 25pr in 120 min	

FIGURE 3-1. CORDA ABSTRACT FORMAT (CONTINUED)

### 3.3 LIMITATIONS

Each serial reported by Professor Shephard includes not only a reference to the original World War II report from which data were extracted for that report, but also an indication of the source of the data which World War II researchers recorded in the original reports. The data sources were varied, as were the techniques used by individual researchers to gather the data, particularly quantitative data. Professor Shephard discussed the effects of the variation in data sources and collection techniques in CORDA Volume I. Several of his comments are quoted in the remainder of this section.

#### 3.3.1 The Effect of Variation of Data Sources.

In discussing the effect of the variation in data sources Professor Shephard stated, "It is obvious that, from their very nature, the accuracy of the data given in the abstracts is uneven and varies from source to source. Some of the best is probably that which is annotated as being based on "ground recce." At the other end of the scale will be that based on the memory of soldiers who were subjected to bombardment. In between are data based on "planned figures" when there is no guarantee that these were achieved in practice." (p. 3)

Professor Shephard, referring to himself and his research assistant, further noted that, "The authors (of Volumes I and II), aware of these difficulties, made every effort to check and cross-check all the figures they recorded. Any estimates that they made for quantities not recorded in the original reports are annotated accordingly. They believe that the abstracts are as accurate as possible and they have ensured that they are internally consistent." (p. 3)

For this study SAIC also reviewed all of the abstracts, including those in Volumes I and II, and reported a number of inconsistencies to Professor Shephard. Professor Shephard and his research assistant have again investigated

each of these inconsistencies and, while some have been resolved<sup>1</sup>, have reported that in some cases the original operational reports contained the inconsistencies. According to Professor Shephard this situation is not unusual given the difficulties of collecting battle data and the adverse circumstances under which many of the original reports were written. In fact, he reports that the quality of the original battle data from which the abstracts were taken is considered to be very good in comparison to other combat data sets. Despite this, some cases of conflicting data could not be resolved. An example of this situation will be discussed later in this section.

### 3.3.2 The Effect of Quantitative Estimation Techniques.

With respect to issues concerning quantitative data, Professor Shephard stated, "The quantity recorded that has caused the most difficulty in this respect, and which must be treated with the most suspicion if quoted, is that for "target area" (and hence bombardment density). The numbers of rounds fired, and the period over which they were fired, is generally precisely known. However, different reports are not always consistent in what they mean by target area; sometimes the area given is that of a notional rectangle within which all the parts of the target complex are believed to lie; sometimes it is that based on a ground survey of the distribution of craters; sometimes on the expected dispersion of rounds as given by range tables. The authors of the present report preferred to quote an area similar to the first of these alternatives - namely, the area of the target as it might be outlined on a map. But this has not been easy to estimate to any high degree of accuracy and they would be the first to admit it.... The reader can only be asked to note these comments and to include appropriate reservations in any analyses based on the figures quoted here." (p. 3) (emphasis added)

While Professor Shephard was specifically referring to Volumes I and II

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<sup>1</sup> Inconsistencies which existed in the original drafts of Volumes III and IV have been corrected in the final versions of these volumes. Inconsistencies in Volumes I and II were corrected via publication of an errata sheet (Corrigendum) for each volume. These are listed as Appendices to this report and are bound separately.

in his comments on target area, the same difficulty exists in the serials reported in Volumes III and IV. The study team has concluded that operations above battalion level are generally difficult to describe accurately and collect data on. This difficulty extends not only to target area but also to the recording of bombardment and results data. The operations in Volumes III and IV which involve amphibious landings, for example, are often so large, and the data aggregated to such a level, as to call into question their usefulness in modeling suppression. Smaller operations involving squads and regiments can generally be assumed to have more reliable bombardment and results data and are thus believed to be of greater potential use in modeling. This issue will be discussed more fully in Section 7 of this report.

### 3.3.3 The Use of "Equivalent" Bombardment Factors.

Returning to Professor Shephard's comments concerning data limitations in Volume I, he stated, "Finally, it may be noted that in common with most reports of WW II vintage, bombardment densities have been quoted in terms of "equivalent 25 pounders" using conversion factors universally quoted to convert for other calibers. The concept of "equivalent 25 pounders" is not easy to justify rigorously, nor indeed did it meet with uniform approval by analysts in the war years." (p. 4)

Because this gun was the most common artillery piece in service with the field force units of the Royal Artillery during WW II, it became common practice for OR Group researchers to normalize bombardment data on "pounds of explosive" to 25-pounder equivalent data. According to Jane's Weapons Systems 1979-80, the 25-pounder, first designed in 1935 as a replacement for the 18-pounder used during World War I, was a towed, 88mm gun with high explosive shells weighing 11.3 kilograms and a maximum range of 12,252 meters.

Especially troubling to Professor Shephard, however, is the fact that the conversion factors refer more to lethality effects than suppressive effects. He feels that it may be more appropriate to use the number of rounds and/or pounds data rather than equivalent pounds data in any analytical efforts.

### 3.3.4 Examples of Data Limitations.

Figure 3-1 (Report 8 of Serial 10) illustrates problems encountered with conflicting data in the original reports. The table listed under paragraph 2.2 of the abstract contains data which conflict with data contained in the BAS. In the phase of the artillery bombardment extending from time H+5 to time H+30, the paragraph 2.2 table indicates that 20 rounds per field (fd) gun (i.e., 25 pounder) and 10 rounds per medium (med) gun (i.e., 5.5 inch) were fired. The BAS, however, indicates that 15 rounds per 25 pounder gun and 15 rounds per 5.5 inch gun were fired. Similarly, the data for the time period H+30 to H+60 varies between the paragraph 2.2 table and the BAS. Since the correct data cannot be determined from the original report the data is presented as it appears in the original.

Figure 3-1 also provides an example of incomplete data in the original reports. Since no firing data were reported in the original report for the 7.2 inch howitzers, it had to be assumed that the heavy battery did not actually participate in the bombardment of the objective. Additionally, it had to be assumed that the three troops which fired on the objective were two field troops and one medium troop. Without these assumptions about information which was not provided in the original reports, and without an estimation of the target area by the data abstractor, the BASs and calculations for rounds per square yard, pounds per square yard, and equivalent pounds per square yard could not have been completed. Even some basic data, such as the geographic location of the engagement and the date of the engagement, were not recorded in the original report.

### 3.3.5. General

There are dangers implicit in creating a data base from abstraction of the original data. However, as discussed in Section 4 and 5, every attempt has been to faithfully replicate the CORDA data in the SAIC data base.

## SECTION 4

### DATA DESCRIPTION

This section describes the data abstracted by Professor Shephard from World War II operational reports. The purpose here was to gain a general understanding of the data available in CORDA Volumes I-IV so as to develop an appropriate structure for the data base in which the information would be recorded. Since the military operations reported in Volumes I and II differ significantly in type and scope from those reported in Volumes III and IV, an overview of the data in each set of volumes will be provided in Sections 4.1 and 4.2. Section 4.3 presents an overview of all data and the variables used to describe the total data set.

#### 4.1 CORDA VOLUMES I AND II

In Volumes I and II, twenty-six serials were reported. All but one serial reported single combat actions in which one force engaged another force. Serial 10, however, included 10 separate reports thus bringing the total number of reports in these volumes to 35. Of these, four were not reports of a specific combat action. Three of the four reports included only subjective evaluations of the effect of suppressive artillery fire on troops without reference to specific combat actions. The fourth report was of a series of experiments which had been done to test whether a series of explosions simulating a bombardment would reduce the efficiency of men exposed to the explosions. Thus Volumes I and II contain reports on a total of 31 combat actions. An overview is provided in Table 4-1.

Clearly the actions reported in Volumes I and II are very similar in many aspects. All involved combat action between opposing ground forces and, as indicated in the column labeled "G" (for ground artillery), all involved some level of bombardment by artillery units in support of the ground forces. Only two actions involved the aerial bombardment of enemy targets and there were no

TABLE 4-1. OVERVIEW OF CORDA VOLUMES I AND II

TYPE ACTION	ATTACKER	DEFENDER	LOCATION	NO. OF ACTIONS	BOMBARDMENT		
					G	A	N
Ground	British	German	Italy	23	23	.	.
Ground	British	German	France	1	1	1	.
Ground	N. Zealand	German	Italy	1	1	1	.
Ground	British	Italian	Egypt	2	2	.	.
Ground	German	British	Italy	4	4	.	.
Totals				31	31	2	0

G - Ground      A - Air      N - Naval

actions which included bombardment by naval gunfire. Although there were four actions in which British troops were attacked by German units, 24 of the actions were similar in that German troops were attacked by British units.

The homogeneous nature of the actions reported in these volumes contrasts significantly with that of the actions reported in Volumes III and IV, as discussed next.

#### 4.2 CORDA VOLUMES III AND IV

Volumes III and IV were compiled by Professor Shephard in 1988 under a contract with SAIC as part of this research effort. As discussed in Section 3.1, data collection for this study was driven primarily by the desire to collect as much data as possible from the original operational reports within the fiscal resources available. Since data were not being collected with any particular hypotheses in mind, the effort concentrated on those original reports from which data could be most easily extracted. In all, 23 additional serials were reported in Volumes III and IV with each reporting on a single combat action in which one force engaged another. Table 4 2 provides an overview of these 23 actions.

TABLE 4-2. OVERVIEW OF CORDA VOLUMES III AND IV

TYPE ACTION	ATTACKER	DEFENDER	LOCATION	NO. OF ACTIONS	BOMBARDMENT		
					G	A	N
Ground	British	German	Italy	3	2	-	-
Ground	British	German	France	4	3	4	-
Ground	British	German	Holland	2	-	2	-
Ground	British	German	Germany	1	-	1	-
Landing	US	Japanese	Pacific	12	9	12	12
Landing	British	German	France	1	1	1	1
Totals				23	15	20	13

G - Ground      A - Air      N - Naval

Unlike the actions reported in Volumes I and II, the actions in these volumes were quite dissimilar in type of action and type of bombardment. While all 31 of the actions reported in Volumes I and II were of combat action between opposing ground forces, over half of the actions reported in Volumes III and IV involved amphibious landings. Each of the 13 landing operations was similar in that both aerial and naval gunfire bombardments were employed in the attempts to suppress the enemy forces opposing the landing. Although 10 of the landings were also supported by ground artillery positioned on already captured beaches or islands, the primary firepower supporting the landings was provided by naval aircraft and naval gunfire.

Ten additional ground combat actions were also reported in Volumes III and IV. These too, however, differed from the actions in previous volumes. Of the 10 ground actions, only five involved support of ground forces by ground artillery units while seven included support in the form of aerial bombardment. One action between an attacking British force and German defenders in Italy actually involved no reported bombardment of the German position.

The diverse nature of the combat actions reported in Volumes III and IV provided an unexpected challenge in the development of a data base structure

and format capable of recording pertinent data from all four volumes. The next subsection describes the results of an analysis conducted to provide an understanding of the data to a level of detail which would permit the proper data base structure to allow for the accomplishment of the study objectives.

#### 4.3 OVERVIEW OF CORDA VOLUMES I-IV DATA

In all, a total of 54 actual combat actions were reported in Volumes I-IV. In terms of describing the suppressive effects of bombardment, whether the bombardment be artillery, aerial, or naval gunfire, more detailed information than provided in Sections 4.1 and 4.2 about each action was required. Specifically, the data were analyzed to describe more fully the combat operation in terms of targets engaged, the artillery fire plans, and the scope of the operations. Additionally, the variables which describe the combat actions were identified and categorized to provide the basis for a data base structure.

##### 4.3.1 Overview and Scope of Combat Operations.

In any attempt to describe the suppression effects of bombardment it is essential to have as complete an understanding of the target and of the bombardment plan as possible. As the initial step in gaining an understanding of the data in these important areas, each of the 54 actions reported was analyzed to determine the number of distinct targets which were engaged during the action and the number of phases, as defined in Section 3, in the fire plan for each target. This information is presented in Table 4-3 below.

TABLE 4-3. TARGET AND BOMBARDMENT PHASE DATA

TYPE ACTION	NO. OF ACTIONS	NO. OF TARGETS	NO. OF PHASES
Ground	41	86	167
Landing	<u>13</u>	<u>16</u>	<u>20</u>
Totals	54	102	187

Seventeen of the 41 ground combat actions involved the bombardment of more than one target, including one action in which seven distinct targets were engaged and three other actions in each of which six distinct targets were engaged. The bombardment plans for the 86 targets indicated that 33 were engaged in multiple phases, with the maximum number of phases reported for the engagement of a single target being 10. The remainder of the targets were engaged in a single-phased fire plan.

In the reports of amphibious landings only three actions involved the engagement of multiple targets and in each case the number of targets engaged was two. Identification of the phases of the bombardment plans supporting amphibious landings was more difficult than for most of the ground actions because of the inclusion of both aerial bombardment and naval gunfire in the fire plans. For three targets, however, it was possible to determine that the bombardment plans did include distinct phases. In these cases, two targets were engaged in two phases each and one target was engaged in a three phase plan.

The scope of the combat operations reported in the 54 actions was broad:

- o The size of attacking forces ranged from a single infantry squad to multiple corps.
- o The size of defending forces ranged from a single platoon to multiple divisions.
- o The size of the target area over which the bombardments occurred ranged from 2,000 square yards to an entire Pacific island of approximately 50 square miles.
- o The weapons used in the bombardments ranged from mortars to 16-inch naval shells weighing 1,900 pounds and bombs weighing 2,000 pounds.
- o The bombardment times for phases of an engagement ranged from one minute to 49 days.

The diverse nature of the actions reported and the scope of the combat operations provided a significant challenge in the development of a data base in which all actions could be recorded and our understanding of suppression enhanced.

#### 4.3.2 Variables Which Describe the Data.

In order to develop a data base structure in which combat actions could be recorded a list of variables was developed which permitted the description of each action. This list included 48 variables, both quantitative and qualitative, which were then grouped into six categories depending upon the type of data which each variable described. The six categories are:

- o Identification Data
- o Serial Data
- o Target Data
- o Firing Data
- o Results Data
- o Calculated Data

Identification data includes nine variables and provide a way to reference combat data to both the Serial Reports in CORDA Volumes I-IV and the original British Operational Reports from which the CORDA data were extracted. Identification data also provide a means by which one data base record can be referenced to another data base record dealing with the same combat action. Specific variables which provide identification data are displayed in figure 4-1.

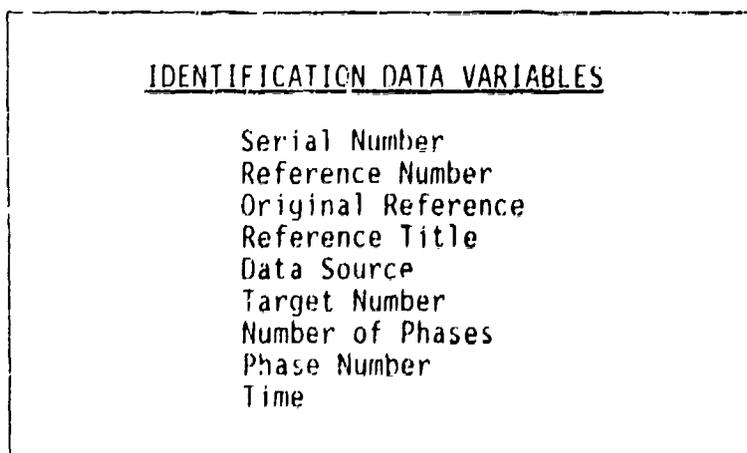


FIGURE 4-1. IDENTIFICATION DATA VARIABLES

Serial data are defined by fifteen variables which describe the opposing forces; the date, location, weather, and time of the action; the serial tactics; and the number of targets and phases of the engagement of each target. Serial data variables are presented at Figure 4-2.

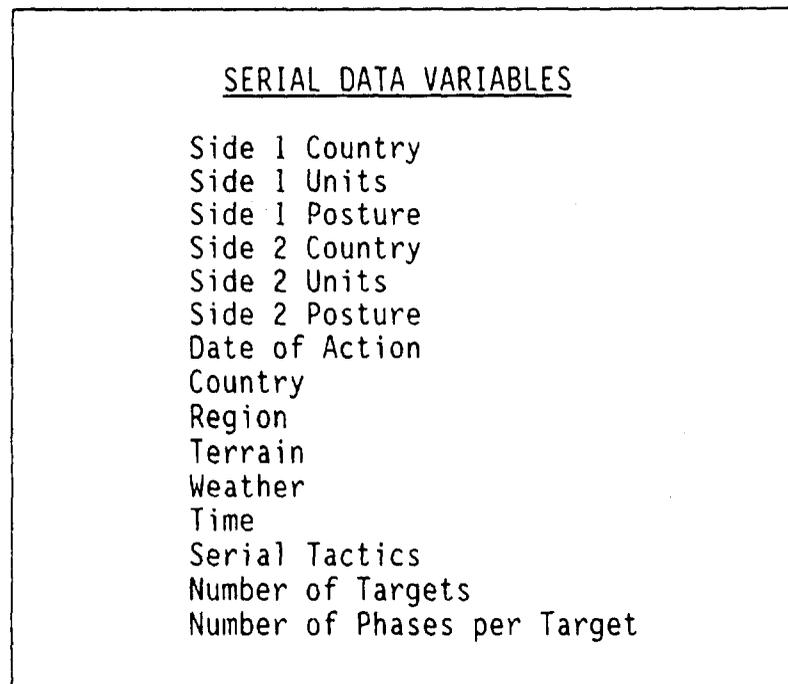


FIGURE 4-2. SERIAL DATA VARIABLES

Target data are defined by four variables include the target area, the tactics of the overall target bombardment, and the tactics involved in each phase of the fire plan. The target data variables are presented in Figure 4-3.

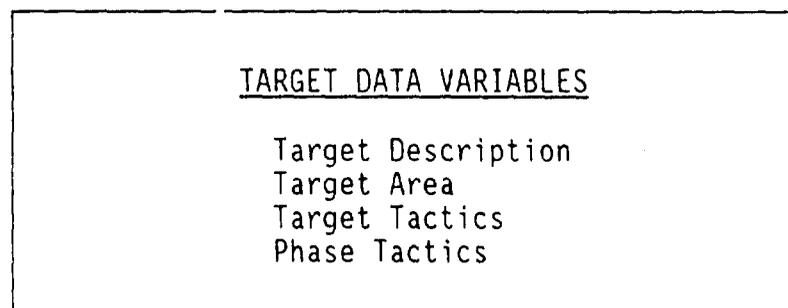


FIGURE 4-3. TARGET DATA VARIABLES

Firing data are represented by seven variables which describe the firing unit, weapon types, rounds, and duration of the bombardment. The firing data variables are presented in Figure 4-4.

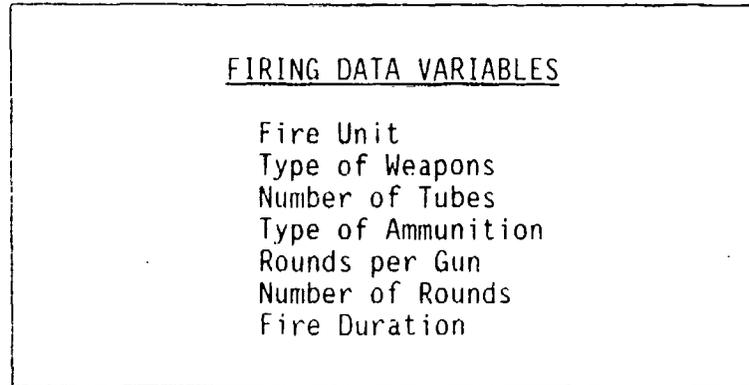


FIGURE 4-4. FIRING DATA VARIABLES

Results data are identified by seven variables which describe the results of both the bombardment and the infantry attack. Of particular interest is the variable which describes the suppressive results of the bombardment. Figure 4-5 presents the results data variables.

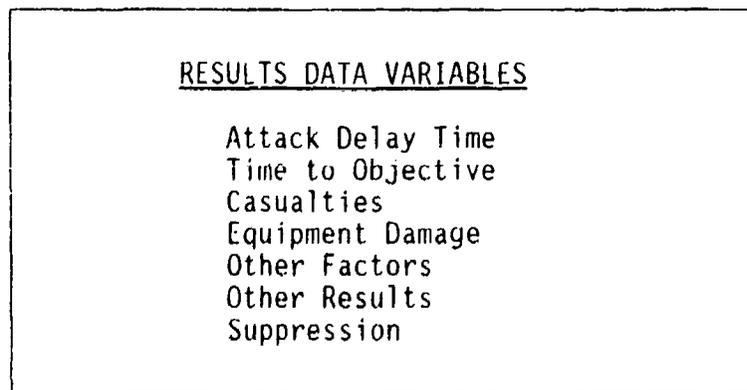


FIGURE 4-5. RESULTS DATA VARIABLES

Calculated data are represented by six variables which describe the density and intensity of the bombardment. Calculated data variables are presented in Figure 4-6.

<u>CALCULATED DATA VARIABLES</u>
Rounds per Square Yard
Rounds per Square Yard per Minute
Pounds per Square Yard
Pounds per Square Yard per Minute
Equivalent Pounds per Square Yard
Equivalent Pounds per Square Yard per Minute

FIGURE 4-6. CALCULATED DATA VARIABLES

The variables in the six categories can be used to describe the actions at three levels, i.e., Serial, Target, and Phase. Since not all variables are applicable to all levels, the variable categories can be used as building blocks to create a three-tier data base structure. The development of the data base structure will be described in the next section.

## SECTION 5

### DATA BASE DEVELOPMENT

In this section the development of the data base<sup>1</sup> which was used to store and analyze the data contained in the abstracts will be discussed. The purpose of this phase of the study was to develop and use a format for recording and preserving the data. Section 5.1 presents the concept and principles used in developing the data base. Section 5.2 describes the hierarchical structure of the data base and the reasons behind choosing such a structure. The specific conventions and notations used in data entry are presented in Section 5.3. Finally, example data base listings are presented and discussed in Section 5.4.

#### 5.1 CONCEPT

The data base records and preserves the combat operational data and provides a tool for evaluating the usefulness of the original data. The data base should only be used in conjunction with the abstracts.

As noted earlier, the guiding principle in developing the data base was to record the data reported in the abstracts. No interpretations or assumptions were used to enhance or supplement the information.

#### 5.2 STRUCTURE

Data in the abstracts occur at three different levels. Some data apply to the action or engagement as a whole. Examples of such data would be the nationalities of the combatants and the location of the engagement.

Other data apply to a target within an engagement. Since an engagement may involve multiple targets, data may be given on each particular target.

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<sup>1</sup> Technically, three distinct data bases were developed. However, for simplicity, reference will be made to the data base.

Examples of such data would be the target size and a description of the target.

Since a particular target may have a fire plan associated with it which contains multiple phases, a third level of data exists. Examples of data at the phase level would be the number of guns of a particular type, the number of rounds per gun fired in that phase, and the duration of the phase.

SAIC developed a three-tiered, hierarchical data base structure to best represent the data: a SERIAL data base, a TARGET data base, and a PHASE data base. They are linked through the SERIAL, TGT\_NO, and PHASE\_NO fields. (See Table D-1, Data Dictionary, on page D-4 for definitions and descriptions of specific data fields.) In the SERIAL data base, each engagement has its own record. In the TARGET data base, each target of the engagement has its own record. In the PHASE data base, each phase of a target of an engagement has its own record. For example, if an engagement has two targets, each target having three phases, then there would be six records for that engagement in the PHASE data base.

### 5.3 DATA ENTRY

Two principles guided the data entry effort. First, data were recorded at the lowest level possible in the three-tier structure. The reason for doing this is that data can always be "rolled up" to the next higher level, but they cannot always be broken out to the next lower level. For example, if a target had only one phase, and the firing data in the abstracts were reported at the target level, then the firing data were recorded at the phase level in the data base.

Second, data were recorded at only one level in the three-tier structure. At the other levels, the particular data field would refer to the level at which the data were recorded. For example, if suppression data were entered at the SERIAL level, then the suppression field in the TARGET and PHASE records for that serial number would contain "SERIAL LEVEL." This informs the user that suppression data are available in the SERIAL data base.

Due to practical limitations in field lengths, codes were developed for each type of weapon. These codes, along with their corresponding weapon description, are at Table 5-1. This allows codes to be entered into the data base instead of lengthy weapon descriptions.

TABLE 5-1. WEAPON CODES

<u>CODE</u>	<u>WEAPON TYPE</u>	<u>NATIONALITY</u>
A	25pr gun	British
B	60pr gun	British
C	3.7in mountain howitzer	British
D	4.2in mortar	British
E	4.5in gun	British
F	5.5in gun (80 lb shell)	British
G	6in howitzer	British
H	7.2in howitzer	British
J	105mm gun	German,American
K	150mm gun	German
L	88mm gun	German
M	14in gun (Naval)	American
N	8in gun (Naval)	American
P	5in gun (Naval)	American
Q	16in gun (Naval)	American
R	6in HE gun (Naval)	American
S	6in AP gun (Naval)	American
T	Unidentified Bombs	British
U	4in gun (Naval)	American
V	4.5in rocket	American
W	4.2in mortar	American
X	Field Gun	British
Y	Various Calibers	British
AA	500lb bomb	American
BB	100lb bomb	American
CC	5in antiaircraft	American
DD	155mm howitzer	American
EE	1000lb bomb	British
FF	75mm gun	American

To assist in discussing data entry conventions, examples of data base listings are presented in Figures 5-1 through 5-4. The examples used are from the same serial (Serial 10, Report 8) described in section 3.2 and referred to in the data bases as serial 10.08.

In certain cases, slashes (/) were used in the data fields to separate

each target's number of phases. There are two types of situations in which slashes were used. First, they were used in the NO\_PH\_PTGT field, which indicates the number of phases per target. In serial 10.08 (Figure 5-1), there are two bombardment targets. The NO\_PH\_PTGT field contains "7/10." This indicates that the first target has seven phases and the second target has 10 phases.

The second situation in which slashes are used is when data for different targets are recorded at different levels. Since serial 10.08 does not provide an example of this situation, see the serial record for serial 9 on page E-31. Serial 9 has six targets. The first and second targets each have three phases, while targets three through six each have one phase. In serial 9, the TARGET field, which gives a description of the bombardment target, contains "TARGET/TARGET/PHASE/PHASE/PHASE/PHASE." This indicates that a description of the bombardment target can be found in the TARGET data base for the first and second targets and in the PHASE data base for targets three through six.

Commas were used in the data fields to separate numbers corresponding to weapon types. For example, in serial 10.08, target number 1, phase number 1 (Figure 5-3), commas are used to separate numbers corresponding to weapon types A and F. The NO\_TUBES field contains "8A,4F," indicating that eight guns of type A and four guns of type F were used in this phase of the bombardment. Commas were used most frequently in the firing data category and the calculated data category.

Semicolons separate data relating to the two sides involved in the engagement. Data for Side 1 are always listed first, followed by a semicolon and then the data for Side 2. The nationalities of the sides are usually given in parentheses if the field length permits. In serial 10.08, for example, the CASUAL\_DAM field, referring to personnel casualties, contains the entry "UNKNOWN (GERMAN); UNKNOWN (BRITISH)" meaning that personnel casualties for each side are unknown. Semicolons were used most frequently in the results data category, especially when referring to casualties or equipment damage.

SERIAL DATA

SERIAL: 10.08  
 REF NUMBER: A9  
 ORIG REF: IORS 1/24 PART II  
 REF TITLE: THE EFFECTIVENESS OF ARTILLERY IN ITALY, 1944  
 DATA SOURCE: ACTION REPORT NUMBER 8

----- SERIAL DATA -----

SIDE 1 COUNTRY: BRITAIN  
 SIDE 1 UNITS: 3 FD REGT, 1 MD REGT, 1 HV BATT  
 SIDE 1 POSTURE: ATTACKING  
 SIDE 2 COUNTRY: GERMANY  
 SIDE 2 UNITS: ??  
 SIDE 2 POSTURE: DEFENDING

DATE OF ACTION: ??  
 COUNTRY: ITALY  
 REGION: ??  
 TERRAIN: HILL TOP  
 WEATHER: ??  
 TIME: 2300

SERIAL TACTICS: EMPLOY CRASH AND HARASS PLAN TO SUPPORT ATTACK BY FORCING GERMANS TO  
 EVACUATE POSITIONS.

NO. BMBRD TARGETS: 2  
 NO. PHASES/TGT: 7/10

----- TARGET DATA -----

BOMBARD TARGET: TARGET LEVEL

BOMBARD TGT AREA: TARGET LEVEL  
 BOMBARD TACTICS: TARGET LEVEL

----- FIRING DATA -----

FIRE UNIT: PHASE LEVEL  
 TYPE WEAPONS: PHASE LEVEL  
 NUMBER TUBES: PHASE LEVEL  
 TYPE AMMO: PHASE LEVEL  
 ROUNDS PER GUN: PHASE LEVEL  
 NUMBER ROUNDS: PHASE LEVEL  
 FIRE DURATION: TARGET LEVEL AND PHASE LEVEL

----- RESULTS DATA -----

ATTACK DELAY TIME: ??  
 TIME TO OBJECTIVE: ??  
 CASUALTIES: UNKNOWN (GERMAN);UNKNOWN (BRITISH)  
 EQUIPMENT DAMAGE: ??;??  
 OTHER FACTORS: NONE

OTHER RESULTS: ??  
 SUPPRESSION: POSITION WAS NOT SUPPRESSED AT THE TIME OF THE INFANTRY ATTACK;POSIT  
 ION WAS STRONGLY DEFENDED BY MG FIRE WHEN INFANTRY ADVANCED

----- CALCULATED DATA -----

RDS/SQ YD: TARGET LEVEL  
 RDS/SQ YD/MIN: TARGET LEVEL  
 LBS/SQ YD: TARGET LEVEL  
 LBS/SQ YD/MIN: TARGET LEVEL  
 LBS/SQ YD (EQ): TARGET LEVEL  
 LBS/SQ YD/MIN (EQ):TARGET LEVEL

FIGURE 5-1. SERIAL RECORD

TARGET DATA

```

SERIAL:          10.08
TARGET NUMBER:   1
NUMBER PHASES:   7
TIME:            2200
----- TARGET DATA -----
TARGET:          GERMAN POSITIONS ON HILL TOP

TARGET AREA:     1875000
TARGET TACTICS:  THREE CRASH PHASES (1,4,5) AND FOUR HARASS PHASES (2,3,6,7)

----- FIRING DATA -----
FIRE UNIT:       PHASE LEVEL
TYPE WEAPONS:    PHASE LEVEL
NUMBER TUBES:    PHASE LEVEL
TYPE AMMO:       PHASE LEVEL
ROUNDS PER GUN:  PHASE LEVEL
NUMBER ROUNDS:   PHASE LEVEL
FIRE DURATION:   120

----- RESULTS DATA -----
ATTACK DELAY TIME: SERIAL LEVEL
TIME TO OBJECTIVE: SERIAL LEVEL
CASUALTIES:        SERIAL LEVEL
EQUIPMENT DAMAGE:  SERIAL LEVEL
OTHER FACTORS:     SERIAL LEVEL

OTHER RESULTS:     SERIAL LEVEL
SUPPRESSION:       SERIAL LEVEL

----- CALCULATED DATA -----
RDS/SQ YD:         0.000371A,0.000109F
RDS/SQ YD/MIN:     ??A,??F
LBS/SQ YD:         0.00928A,0.0087F
LBS/SQ YD/MIN:     ??A,??F
LBS/SQ YD (EQ):    0.00928A,0.00722F
LBS/SQ YD/MIN (EQ):??A,??F
  
```

FIGURE 5-2. TARGET RECORD

To distinguish between instances where a report does not mention a particular piece of information and where a report states that the particular piece of information was unknown or unavailable, a simple convention was used. When a report does not mention a piece of information, "??" is entered into the field. When a report states that the piece of information was unknown, "UNKNOWN" is entered into the field. Thus, no field is ever left blank. At the same time, the distinction between unreported and unknown data is preserved. The distinction is not always important or useful, but SAIC wanted to record the data as faithfully as possible and not make the assumption that the terms "unknown" and "unreported" have the same meaning.

PHASE DATA

```

SERIAL:          10.08
TARGET NUMBER:   :
PHASE NUMBER:    1
TIME:           2200
----- TARGET DATA -----
TARGET:         TARGET LEVEL

TARGET AREA:    TARGET LEVEL
PHASE TACTICS:  CRASH

----- FIRING DATA -----
FIRE UNIT:      2 FD TROOPS, 1 MO BATT
TYPE WEAPONS:   A,F
NUMBER TUBES:   BA,4F
TYPE AMMO:      ??A,??F
ROUNDS PER GUN: 6A,3F
NUMBER ROUNDS: 48A,12F
FIRE DURATION:  ??

----- RESULTS DATA -----
ATTACK DELAY TIME: SERIAL LEVEL
TIME TO OBJECTIVE: SERIAL LEVEL
CASUALTIES:       SERIAL LEVEL
EQUIPMENT DAMAGE: SERIAL LEVEL
OTHER FACTORS:    SERIAL LEVEL

OTHER RESULTS:   SERIAL LEVEL
SUPPRESSION:     SERIAL LEVEL

----- CALCULATED DATA -----
RDS/SQ YD:       TARGET LEVEL
RDS/SQ YD/MIN:   TARGET LEVEL
LBS/SQ YD:       TARGET LEVEL
LBS/SQ YD/MIN:   TARGET LEVEL
LBS/SQ YD (EQ):  TARGET LEVEL
LBS/SQ YD/MIN (EQ): TARGET LEVEL

```

FIGURE 5-3. PHASE RECORD 1

#### 5.4 DATA BASE EXAMPLE

This section presents and discusses an example extracted from the data base. The partial data base listings at Figures 5-1 through 5-4 deal with serial 10.08, for which the actual CORDA abstract was presented in Figure 3-1 during discussion of the data collection effort. Only one of the two TARGET records and two of the 17 PHASE records are listed. Once the reader understands these records, it would be tedious and redundant to discuss all 20 records associated with serial 10.08.

PHASE DATA

SERIAL	10 00
TARGET NUMBER	1
PHASE NUMBER	2
TIME	2200
----- TARGET DATA -----	
TARGET	TARGET LEVEL
TARGET AREA	TARGET LEVEL
PHASE TACTICS	SUSTAINED FIRE
----- FIRING DATA -----	
FIRE UNIT	2 FO TROOPS, 1 MD TROOP
TYPE WEAPONS	A, F
NUMBER TUBES	8A, 4F
TYPE AMMO	77A, 77F
ROUNDS PER GUN	20A, 10F
NUMBER ROUNDS	190A, 40F
FIRE DURATION	20
----- RESULTS DATA -----	
ATTACK DELAY TIME	SERIAL LEVEL
TIME TO OBJECTIVE	SERIAL LEVEL
CASUALTIES	SERIAL LEVEL
EQUIPMENT DAMAGE	SERIAL LEVEL
OTHER FACTORS	SERIAL LEVEL
OTHER RESULTS	SERIAL LEVEL
SUPPRESSION	SERIAL LEVEL
----- CALCULATED DATA -----	
RDS/SQ YD	TARGET LEVEL
RDS/SQ YD/MIN	TARGET LEVEL
LBS/SQ YD	TARGET LEVEL
LBS/SQ YD/MIN	TARGET LEVEL
LBS/SQ YD (EQ)	TARGET LEVEL
LBS/SQ YD/MIN (EQ)	TARGET LEVEL

FIGURE 5-4. PHASE RECORD 2

In the identification data category of the SERIAL record (Figure 5-1), the reader can see that the record pertains to action report number eight of serial number 10 and deals with the effects of artillery in Italy in 1944. In the serial data category, the data fields indicate that British Infantry and fire support units (consisting of three fields regiments, one medium regiment, and one heavy battery) were attacking German positions, the nature of which was unreported. The date of the attack was also unreported, but it occurred on a hill top somewhere in Italy. The British used a crash and harass plan designed to force the Germans to abandon their position. The attack began at 2300 hours, and involved the bombardment of two targets. The first target was engaged in

seven phases, while the engagement of the second target had 10 phases.

The target data category indicates that the data for these fields can be found in the TARGET data base. The TARGET data base record for target number one (Figure 5-2) indicates that the target was German positions on a hill top. The target area was 1,875,000 square yards, and the plan was to alternate crash phases with harass phases.

Turning back to the SERIAL record, the reader finds that all of the firing data can be found in the PHASE data base. Figure 5-3 presents the record for phase one of target number one, and Figure 5-4 presents the record for phase two. In phase number one, two field troops and one medium battery used eight 25 pounder guns and four 5.5 inch guns in the bombardment. Each 25 pounder gun fired six rounds, and each 5.5 inch gun fired three rounds, for a total of 48 25 pounder rounds and 12 5.5 inch rounds in the phase. The type of round (high explosive, armor piercing, etc.) and the duration of the phase were not stated in the source documents on this action.

In phase number two, the same units used the same types and numbers of guns, but they fired a different number of rounds. They fired a total of 160 25 pounder rounds and 40 5.5 inch rounds over a period of 30 minutes.

The results data category for serial number 10.08 contain several data fields which were not mentioned in the abstract. The attack delay, time to the objective, equipment damage, and other results were never mentioned. However, the abstract does state explicitly that casualty data were unknown for both sides. The abstract also clearly states that suppression was not achieved at the time of the British infantry attack.

Information for the calculated data category can be found in the TARGET data base. The TARGET data base record for target number one (Figure 5-2) records data on the number of rounds per square yard, pounds per square yard, and equivalent pounds per square yard for both 25 pounder and 5.5 inch rounds. Although the data fields for rounds per square yard per minute, pounds per square

yard per minute, and equivalent pounds per square yard per minute were not given in the abstract, they can be inferred since the fire duration was given (120 minutes).

Now that all of the data categories in the SERIAL record have been discussed, we turn our attention to the TARGET records (Figure 5-2). For the sake of brevity, only the record for target number one is presented. The identification, target, and calculated data categories have already been discussed. The firing data category, with the exception of fire duration, contains only references to the PHASE data base. Fire duration is recorded in the TARGET data base because some of the phases may overlap. Therefore, the fire duration for the target cannot be calculated by summing the fire durations for each phase of the target fire plan. The results data category contains only references to the SERIAL data base. The data in these fields were discussed earlier.

We can now turn our attention to the PHASE records, presented in Figures 5-3 and 5-4. The data in the firing data category were already discussed. The data in the identification category simply identify the particular phase and state what time the phase began. In the target data category, the description and size were given in the TARGET data base. Phase one was a "crash" phase, while phase two was a "sustained fire" phase. All of the data fields in the results category were entered at the SERIAL level, and all of the data fields in the calculated category were entered at the TARGET level.

This section has attempted to explain the structure and contents of the data bases. The principles, codes, notations, and conventions were explained and then illustrated by example. Appendix D, "User's Guide to the Data Base," includes specific instructions on the use of the data base and a data dictionary. All data records are reprinted in their entirety in Appendix E, "Data Base Records." The next section will focus on an evaluation of the availability and the usefulness of the data entered into the data base.

## SECTION 6

### DATA EVALUATION

This section will be devoted to an evaluation to determine if the data support further analysis of suppressive effects on human behavior and its potential use in Army models. Section 6.1 addresses the focus of the data evaluation effort and describes the two measures used to evaluate the data: availability and usefulness. Sections 6.2 and 6.3 then discuss the availability of a selected set of variables and the usefulness of the data in efforts to model the suppressive effects of indirect fire artillery bombardment.

#### 6.1 FOCUS AND METHODOLOGY

In October 1988, the Government requested that SAIC focus on the following questions when determining the overall usefulness of the data:

- o What data are available in the CORDA collection?
- o What can be done with the data as they exist?
- o What use can be made of the data for modeling?

These questions provided focus for continued examination of the data described in the preceding sections.

The availability of data can be determined by investigating the density and the location of information. Density provides a measure of how much data is available while location indicates whether the data is recorded at the serial, target, or phase level of the data base. Together these characteristics of the data set provide a measure of the number of data points which the original data provide for use in modeling.

SAIC chose to examine a small set of variables believed to be useful in the analysis of suppressive effects. These variables are suppression, rounds

per square yard, pounds per square yard, equivalent pounds per square yard, and duration of bombardment. The variables were selected because of their obvious, intuitive appeal related to the study of suppression effects.

The density and location of data in these variables, at the three different levels, are important in determining their usefulness. If information exists at all three levels, then the maximum number of data points is available as a basis for the future development of hypotheses. At the opposite extreme, if only partial data exist at the three levels, specific suppression effects gathered from the original reports may not be as valuable as hoped.

## 6.2 DATA AVAILABILITY

The following table represents the density and location of the selected variables and gives a general impression of the availability of data contained in the abstracts.

TABLE 6-1. DATA DENSITY AND LOCATION OF SELECTED VARIABLES

<u>Variables</u>	<u>Serial</u> (54)	<u>Target</u> (102)	<u>Phase</u> (187)
Suppression	41	32	24
Rounds per Square Yard	32	60	35
Pounds per Square Yard	33	69	44
Equiv. Pounds per Square Yard	32	67	43
Duration	35	79	158

A complete and valuable set of data would include data entries for all variables in each of the 54 serial, 102 target, and 187 phase records. The examination of data in the data base at these three levels, however, showed that not all variables had data at all three levels. For example, Table 6-1 indicates that the suppression variable had data recorded in only 41 of the 54 serial records, only 32 of the 102 target records, and only 24 of the 187 phase records. Similarly, Table 6-1 shows that bombardment duration data was recorded in 35 of the serial records, 79 of the target records, and 158 of the phase records.

The true usefulness of the suppression data, however, is dependent upon the density and location of data for those other variables which may be hypothesized as functionally related to the suppression variable. Each of the remaining variables in Table 6-1 could be classified as independent variables in this type of functional relationship and thus information contained in the data base for these variables would be key to an examination of suppression. Although 32 serial records contain data entries for the rounds per square yard variable, only 27 of the 41 serial records which contained information on suppression also contain this data. Similarly, of the 41 records containing suppression data, only 28 contained information on pounds per square yard, only 27 had equivalent pounds per square yard data, and only 33 had duration data. Thus, in testing hypotheses of relationships between the calculated data variables and suppression, fewer than 41 data points would be available. If other variables are also considered or added to a hypothesis, such as unit level or target size, then additional limitations on the number of complete data points available for analysis would be imposed.

The sparseness of the data when they were examined at the three levels was obvious. Even though detailed firing data was often available at the phase level, calculated data often existed only at the target level while results information could only be found at the serial level. Analysis, therefore, would be possible only at that level at which sufficient and complete data existed, which for this example and this original data set would be the serial level.

### 6.3 DATA USEFULNESS

Evaluation of the density and location of data collected from the abstracts at the three tiers of information answered the first question -- data availability. In short, the data were collected and preserved in their original form, which was limited in usefulness for analyzing suppressive effects for models and human behavior because of the sparseness of data at all three levels examined.

Although the data taken from the abstracts, without further enhancement, offer no great amount of directly useful information, some interpretation or manipulation of data would permit additional fill of data entries at lower levels. Through the application of military judgement, military facts, or straightforward arithmetic calculations, additional data elements could almost certainly be added to the appropriate tiers of the data base. This would increase the number of data points available for analysis and directly improve the usefulness of the data.

The idea of interpretation of data, or the proper application of military judgment to the situations described in the abstracts, would not jeopardize the validity of the data. The application of military judgment would simply permit the extraction of additional data which was not explicitly stated in the abstracts. For example, a "medium regiment" identified in support of the engaged UK force generally contained 24 guns or howitzers. This information was defined in other abstracts. Where "medium regiments" were specified in support of UK forces and the number of guns were not separately identified, an enhancement to the original data would add 24 guns for the "medium regiment" included in the engagement abstract. If necessary, enhancements such as this could be validated by collecting operational data from other sources such as war diaries.

Finally, the original documents used by Professor Shephard to prepare the abstracts primarily contained bombardment data. Operational data about the maneuver plans of combat units were limited. This did not allow analysts to appreciate fully how the maneuver forces attacked the various targets identified in the abstracts. Where errors in the firing data were obvious, the availability of additional operational information assisted in correcting the data.

The second question asked by the sponsor addressed what can be done with the data. The data, in their original form, contain inconsistencies and errors. The data have been cross checked, and those errors are not a result of transcription errors during the extraction process. The sparseness of information in key variables limits the number of usable data points to statistically small samples where it would be difficult to draw conclusions for

the population as a whole. Therefore, without enhancement of information, the original data should be used cautiously for analysis purposes.

The final question addressed use of the data for modeling. The use of these suppression effects data for direct comparison with Army model output is questionable. There are limited casualty results recorded for personnel or equipment in sufficient quantities to act as a validation set. The sparseness of data in key variables which are expected to be related to suppression limits the direct use of the original data as a source of information for algorithm development. The lack of a hypothesis during data collection, as well as resource limitations, allowed data from many engagements to be collected, but the scope of the combat operations reported was broad. As discussed in the following section, it is believed that the most complete data relating to suppression effects may be found at the battalion level. Thus if further data collection is undertaken, it should be focused upon battalion level operations so that the usefulness of the data set may be enhanced..

## SECTION 7

### LESSONS LEARNED

#### 7.1 INTRODUCTION

The investigation of suppressive effects of bombardments during World War II involved data collection and analysis. The length of time required to understand the data extracts from WW II operational reports, even given that the original reports had been designed to identify quantitative information, was extensive. The objective of the effort was to collect and preserve data which may very well be important in the long run. Consequently, organization of the data became the focus of SAIC's efforts.

Organization of data into categories which lend themselves to future analysis is often the key to opening the door to better understanding of information. Careful validation and corroboration of data elements leads to confidence that the data collected truly represent its original form. Careful examination and questioning of apparent errors, although rather small in comparison to other judgmental factors such as target area, required a large amount of time to cross-check original data in the UK. As such, the amount of time for analysis of the results was insufficient for anything but preliminary conclusions concerning the usefulness of the data.

From this modest effort over eight months, a series of lessons learned can be drawn. The lessons fall into two groups. The first involves lessons pertinent to the operational data and their collection and interpretation, while the second deals more with administrative matters related to the effort.

#### 7.2 LESSONS LEARNED FROM EXAMINATION OF HISTORICAL REPORTS

The principal lessons learned from the research effort concern the effects of suppression on personnel contained in the original reports, the location of

where the best information is more than likely contained, and the need to have additional information to better understand the original reports. They and other lessons learned are discussed individually below.

#### 7.2.1 Suppressive Data Contained in Operational Reports.

**The WW II data, in their original form, do not support a clear understanding of the suppressive effects of bombardment on personnel.**

The 46 abstracts collected from the original WW II reports by Professor Shephard contained bombardment information on engagements which ranged from squad to corps size and durations which lasted from minutes to days. The quantitative information which specified the number of rounds fired, the time of firing, the type of weapons doing the firing, and, in some instances, the patterns of bombardment (fire plans) were sufficiently covered in the original reports.

On the other hand, the suppressive effects one would like to identify were not clearly identified in the original reports. Review of the comments made by the commanders on the ground or the scientists collecting the data, did not identify quantitative measures of performance or data in sufficient numbers to come to any conclusions. Therefore, the usefulness of the data as a direct source of information to validate existing models of suppression is limited. Further, analysis of the data and the application of military judgement, to include interpretation of original data, to form a data set more useable for analysis is required.

#### **Interpretation of original data may increase their useability**

The original data are sparse in specific maneuver and fire support unit identifications. Terms such as "coys", "medium regiments", and "light regiments" were used frequently. In these cases, the data did not reflect total numbers of weapons firing, nor the caliber of the weapons. Consequently, this limited the useability of the data even if specific suppressive effects were annotated in the reports.

Similarly, the identification of suppressive results in the various original reports was very limited. Comments made by the various commanders, some indications of casualties or losses, or comments reflecting unit performance were not frequent. This also limits the useability of the data in their original form.

Inference of the effects of suppressive fires can be attempted, but must be cast as military judgment based upon other information about the engagement. Terms such as "met light resistance" or "few casualties were sustained" suggest that the suppressive fires were successful, but they must be tempered by the time between the end of bombardment and the actual engagement of maneuver forces.

By the application of military judgement, military facts such as the number and type of guns in various units, and in many cases simply by completing straightforward arithmetic calculations, the density of the data in the data base may be increased from its original level. This "enhancement" of the data set would create additional data points and hence increase the usefulness of the data for the development of hypotheses and mathematical models.

**The collection of information concerning suppressive effects is best found at battalion level.**

Professor Shephard, after reviewing a large number of original documents, is convinced that specific comments concerning the effects of suppressive fires are best obtained by searching for them in battalion level engagement reports. It is his impression that comments made by that level have the highest probability of containing exact comments about the nature or effects of suppressive fires. At higher levels of reports (brigade, division, corps, etc.) the effects of bombardments are often lost in the summarization of the many battalion level engagement reports.

**Additional operational data concerning the maneuver plans of the forces engaged are needed to fully understand the fire plans and results shown in the operations research reports.**

The operations research reports concentrated upon quantitative data associated with the firing units. Limited information was included concerning the actual maneuver of the units engaged. Access to that information may allow a better representation of suppressive effects by combining the results of the maneuver units with that of firing units. This would require research into war diaries as well as operational data from sources other than the UK operations research bibliography.

**Suppression effects are multi-faceted.**

The lack of clear definitions of suppression leads one to the conclusion that the topic is not well understood. From the research and reading done in conjunction with this effort, it is clear that the following can be stated, but not proven yet.

- o Human performance is related to morale effects.
- o Suppressive fires affect unit performance during the time the fires are conducted.
- o The density of fires upon a target does have some durational effect after the bombardment ceases. This effect is transitory and may be associated with the training or experience of the unit.
- o Suppressive fires conducted over lengthy periods of time may have a direct effect upon unit morale and performance.
- o There is a lower threshold (minimum intensity) below which no suppressive effects occur and unit performance is not degraded.
- o Morale effects can be related to average intensity and to the variation in the pattern of bombardment.
- o Suppression effects may best be measured in levels. The UK literature and reports do not use the term suppression, but instead use "neutralizing and demoralization fires" as two separate terms or levels of effect.
- o Morale effects may be caused by irrational fears such as the belief that a certain weapon, believed to be very dangerous, may be used by the enemy when in fact that weapon is not available to the enemy forces.

### 7.2.2 Administrative Lessons Learned.

The time associated with the extraction, understanding, and organization of operational data is substantial. This should be considered when planning a project of this nature so that adequate time remains for analysis.

As pointed out earlier, the time associated with the extraction, understanding, and organization of operational data abstracted from WW II operations research documents was so great that it left little time to review and conduct anything more than a preliminary analysis of the data once they had been placed in their organized form.

One important goal of the effort was to collect and preserve data from WW II documents which may have been able to shed some light on the topic of suppression and bombardment upon units in combat. The detailed analysis of data elements, accomplished by SAIC and Dr. Helmbold during this contract, required Professor Shephard and his associate to re-check many documents to ensure that apparent errors were, in fact, contained in the original reports, or that a correction was necessary.

#### **Inconsistencies do exist in original reports.**

Correction and cross-checking of data did take place on Volumes III and IV. Because SAIC had access to the first two volumes, the data in those volumes (not collected under this contract) were also subjected to the same attention to detail. Professor Shephard has produced an errata sheet for the first two volumes and corrections, where his abstracts differed from the original reports, are included in the final SAIC report. Time to verify and cross-check data must be taken into account in future efforts of this type.

#### **Additional operational reports were uncovered during the data collection effort.**

During the data collection phase of this effort, Professor Shephard and his associate uncovered additional reports which had not been part of the

original bibliography used to find and abstract information. These reports are categorized as predominantly battalion level operational reports, but some deal with larger unit operations, air support for ground forces in the Pacific, counter-battery fire, air crew effects, morale effects, and effects of flamethrower tanks. These would be sources of information for continued data collection efforts. A bibliography of these reports has been distributed to Government organizations and personnel involved with this study.

**Additional operational data are required to fully evaluate the operations research reports.**

It became clear, as data inconsistencies arose and additional information was needed to correct or confirm the original data, that operational data at the maneuver unit level would be needed to fully appreciate the military significance of suppressive fires on combat units. This is essential to fully understand and interpret the results of the OR reports.

**The organization of data extracted from operational reports should be focused upon the intended use of the final product.**

A data base was created as a tool for analysis of the data collected by Professor Shephard. The format of this data base lends itself to further analysis efforts and may provide a good framework for guiding future historical data collection efforts.

### 7.3 SUMMARY

The lessons learned outlined above were developed with the express view of aiding future historical work in the area of suppressive effects.

## SECTION 8

### DIRECTIONS FOR FUTURE RESEARCH

One objective of this study was to provide recommendations for future research based upon an evaluation of the data collected and the preliminary analysis of their usefulness outlined in Section 6. Future efforts should be guided by the outline of a study plan contained in this section

#### 8.1 OUTLINE OF FUTURE EFFORT

It became obvious, as the study progressed, that analysis and development of algorithms of suppression specifically focused upon Army models could not be created with the data in their original form. A continued effort to collect information (focused upon battalion level engagements), development of hypotheses, testing of hypothesis, and development of a methodology based upon the results is clearly called for. The following sections will explain the need for the effort in each of these areas.

#### 8.2 REVIEW OF SUPPRESSION LITERATURE

The WW II bibliography compiled earlier by Professor Shephard, and updated with this study, provides a basis for reviewing the operations research reports created during WW II which were directed at modeling or summarizing the field reports. Operation research units in the field provided their initial reports to parent organizations in the UK. The reports were reviewed and summarized (often by the same people who had collected the field data), hypotheses were sometimes established, checked, rejected and/or followed, and final reports written. These reports are listed under Category B in the bibliography at Appendix C. These final reports have been the basis for subsequent efforts to understand suppression in both the US and the UK.

During the current effort, a request for documents was forwarded to the UK through Government channels. The report request has been acknowledged, but during the period of this study only three of eight documents requested were received. These were received too late to provide input to this study. It is believed that these reports must be reviewed to determine what hypotheses were established and which ones were rejected. This review will cause the development of hypotheses to concentrate upon those which have merit in their own right and to reject those which were earlier proven to be wrong or incapable of testing.

Recently, Vector Research Incorporated produced an updated report of suppression literature for the HEL. This source, and selected UK Category B reports, can form the basis for an extended review suppression.

### 8.3 DEVELOPMENT OF HYPOTHESES

The two efforts under which data were collected (HEL and the current effort), accomplished the task of preserving data thought useful in the study of suppression. The data collection effort did not have a hypothesis or definition against which data were to be collected. A definition of suppression was provided during the HEL effort, but it was difficult to apply and did not specify the types of data required to be collected. Consequently, the collection was left to the experienced hand of Professor Shephard, with the resources available, to delve into the historical records.

The usefulness of the data collected has been described in Section 6. Preservation of data is still a high priority, but based upon what is known about the data collected already, emphasis should be given first to the collection of data on battalion level engagements and below. Data collection should be initiated with two objectives in mind.

First, data collection should continue after one or more hypotheses have been established. This will serve to focus upon the collection of data needed to test the hypotheses being examined. Secondly, the collection of more data is necessary to validate hypotheses created from existing data. No collection

of data should begin until these steps have been undertaken, unless loss of data through age or regulatory changes threaten to eliminate access to the original sources.

#### 8.4 TESTING OF HYPOTHESES

The data base created from the four volumes of data abstracts during this study effort can be used as a source of information for development of hypotheses. Preliminary efforts to utilize the data in this way have been encouraging.

The obvious dependent variable, the occurrence of suppression, is believed to be described by a multi-variate function. So far, the density of rounds expended upon the target; intensity of bombardment; duration; and effects upon target have been examined. The time parameter associated with duration and the pattern of the bombardment are also felt to be important variables to be considered. There is some evidence to believe that psychological variables (number of shell shock casualties) may be appropriate for inclusion in any deterministic function to be developed.

The goal of such analysis would be the development of an algorithm capable of describing the effects of suppression for Army models, and the creation of a historical data set useful for validation purposes. These goals can best be achieved through the development and testing of several competing hypotheses and measures of effectiveness which are directed at developing a better description of suppressive effects for use in models. This development should be part of any future study efforts.

At the same time work should be done in extending the existing data through interpretation, thereby transforming the data base into a useful analytic tool. Additional data collected in support of future efforts at battalion level will be particularly useful evaluating competing hypotheses.

## 8.5 ALGORITHM DEVELOPMENT

After selecting a hypothesis to represent suppression, algorithms for specific Army models should then be created. The three principal models are CASTFOREM, VIC, and FORCEM. Each model has a different fire support section and each must be reviewed separately to determine what is the best approach for the addition of suppression algorithms based upon this work. It is clear that a conceptual algorithm must be developed. Then specific, detailed implementations of this work should be developed for each model.

## SECTION 9

### STUDY RESULTS

#### 9.1 GENERAL

The purpose of this study was:

To compile, reduce, and analyze data from existing operational analysis reports generated during World War II in order to provide (1) source data for modeling suppression effects due to fire support in division and theater level models and (2) to benchmark or develop approximate standards against which to judge artillery expenditure results from division and theater level models.

Data were abstracted from British World War II operational data reports dealing with the subject of suppression by Professor R. W. Shephard of CODA. These data were combined with that compiled by Professor Shephard for HEL in 1987. The resulting data set was recorded in a three-tiered data base designed to provide an initial means to evaluate it and to enhance its usefulness modeling suppression in US combat models. A preliminary analysis of the CODA data was accomplished.

#### 9.2 CONCLUSIONS

The CODA data was determined to be:

- o Inadequate in its original form for modeling suppressive effects of bombardment or judging model results in division and theater level models.
- o Adequate for initial efforts to develop hypotheses and to identify focused data collection requirements.

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## APPENDIX A

### DEFINITIONS OF SUPPRESSION

During the research phase of this study, a number of definitions of suppression were obtained. It must be noted that no agreement exists among the previous works as to an exact definition. A few of these definitions are shown below.

The first definition was provided to Professor Shephard as part of the objective of the earlier contract for HEL.

Suppression is the degradation of military performance by individual soldiers or units in combat as a result of reaction (voluntary or involuntary) to hostile firepower, whether such reaction is brief and relatively instantaneous, or longer-lasting in the form sometime known as "neutralization." It is to be noted that the reaction called suppression is a result of fear, or caution, induced by actual hostile fire, and is not tactical performance based on training in anticipation of fire. It is also to be noted that suppression is a reaction by soldiers who are not otherwise physically damaged, wounded or killed by hostile firepower. Suppression is manifest by taking cover, and/or otherwise failing to perform assigned or perceived military tasks with the promptness, efficiency, and effectiveness for which the individual soldier or unit was trained in anticipation of combat. Suppression is related to, but distinct from, that form of casualty referred to as psychiatric casualty (also called, variously, shell shock, or combat fatigue).

SAIC behavioral scientists reviewed early versions of the World War II data abstracts and prepared the following definition related to suppression:

Suppression (as the dependent variable) is the increase in response time to resume effective combat behavior after bombardment. May be related to a ratio of what would be expected of a unit who had ceased firing for a period of time comparable to the bombardment time.

Treavor Dupuy, the president of Data Memory Systems, Inc. and a noted historian, had defined suppression in his most recent book, Understanding War: History and Theory of Combat, as follows:

Suppression usually is defined as the effect of fire (primarily artillery fire) upon the behavior of hostile personnel, reducing, limiting, or inhibiting their performance of combat duties. Suppression lasts as long as the fires continue and for some brief, indeterminate period thereafter.

ARI, in Technical Report TR-79-A19, "A Further Look At The Prediction Of Weapons Effectiveness In Suppressive Fire," stated that:

- a. Suppression is the causing of human reactions that reduce individual (unit) efficiency to fire, observe, and move.
- b. Suppression is the degradation of specified combat activity for a particular period of time.
- c. Suppression is a short-term transient degradation in the combat performance of infantrymen. It is produced by their behavioral response to the lethality potential (risk) of impacting weapons that do not incapacitate them.
- d. Suppression is a process which causes temporary changes in performance capabilities of the suppressee from those expected when functioning in an environment which he knows to be passive. These changes are caused by signals from delivered fire or the threat of delivered fire, and they result from behaviors that are intended to lessen risk to the suppressee.

The current fire support field manual, FM 6-20, "Fire Support In Combined Arms Operations" defines several terms as shown below:

- a. Suppression fire is fire on known or suspected enemy locations to degrade the enemy's ability to place effective fire on friendly elements or otherwise impede friendly operations.
- b. Suppression of a target limits the ability of the enemy personnel in the target area. The effect of suppression fires usually lasts only as long as the fires are continued.
- c. Neutralization of a target knocks it out of the battle temporarily. Experience has shown that 10 percent or more casualties may neutralize a unit. The unit will become effective again when casualties are replaced and equipment is repaired.

The Defense Department "Dictionary of Military and Associated Terms," JCS PUB-1 defines related terms as follows:

- a. Suppression is a temporary or transient degradation of the performance of a weapons system, below the level needed to fulfill its mission objectives, by an opposing force.
- b. Neutralization fire is fire which is delivered to hamper and interrupt movement and/or the firing of weapons.
- c. Harassing fire is fire designed to disturb the rest of enemy troops, to curtail movement, and by threat of losses, to lower morale.

It is clear that no one definition contains the essence of suppression. Professor Shephard noted that the United Kingdom operations research personnel did not use the term suppression, but used the following to describe four effects of bombardment:

- a. Neutralizing - preventing enemy movement and observation and, in case of greater effect, preventing the effective use of weapons. The effect only lasts during the bombardment.
- b. Demoralizing - producing, in addition to neutralization, a lack of will to resist, continuing for some time after the end of the bombardment.
- c. Lethal - killing or wounding enemy personnel.
- d. Material - damaging or destroying enemy equipment.

The above UK definitions were taken from only one of many sources. Most closely agree in the way they define the last three. Major differences however are apparent, explicitly or implicitly, in the meaning assigned to "neutralization." For example, one says that neutralization may be achieved by creating unfavourable conditions for the use of a particular weapon, for example, by obscuring it with smoke or dust, or by upsetting the morale of the men serving the weapon. The UK services often used the term inexactly to mean a bombardment was deemed successful. Others ignore anything other than morale effects.

The bottom line is very clear. No single definition for suppression is agreed upon in the community. In the absence of a recognized hypothesis and data for validation, a definition of suppression obviously relates to human performance and morale of units, but no clear relationships have been identified which can be used to satisfy model requirements from existing work.

## APPENDIX B

### GOVERNMENT STATEMENT OF WORK

1. Class of Analysis: Force/Weapons Effectiveness Studies
2. Title: Analysis of Data From WWII Combat Operational Analysis Reports
3. Contract: MDA903-88-D-1000, Task xxxx

4. Task Background:

Prof. Ronald Shephard, Centre for Operational Research and Defence Analysis (CORDA), United Kingdom, has access to a large set of combat operational analysis reports of artillery missions during World War II. He has completed partial analysis of the data contained in the reports and indicates some success in deriving virtual and actual suppression information. The results of the preliminary work, representing about 25 percent of the available data, are with the Human Engineering Laboratory, Aberdeen Proving Ground and are available for integration with the balance of the data (see Scope of Work, below).

The Army will apply the reduced and analyzed data, as appropriate, to help model artillery suppression and to "benchmark" ammunition expenditure in division and theater-level models. Modeling suppression implies knowing the effects of bombardment on the targets and the major parameters of the bombardment (for example, calibers, number of rounds, rate of fire, target characteristics, etc). "Benchmarking" expenditures implies relating the historical situation to the situation in the simulation and comparing rounds fired historically with rounds fired in the simulation. Frequency of fire-support situations, that is, the average total consumption by a type artillery weapon in a specified period of time, should be compiled if easily available in the original operational analysis reports; they were not included in the information provided earlier to HEL.

5. Task Objective:

The objective of this task is the compilation, reduction, and analysis of data from existing operational analysis reports to provide (1) source data to help model suppression effects due to fire support in division and theater-level models and (2) "benchmarks" or approximate standards (experiential levels) against which to judge artillery expenditure results from models. The use of "existing operational analysis reports" is emphasized; no additional archival searching or recovery is contemplated.

6. Scope of Work:

a. As noted above, the basic data sets are available to Prof. Shephard of the United Kingdom. Prof. Shephard has indexed the reports and has unique knowledge of the data sets and the language (acronyms, British Army terminology, and technical terminology) of the reports. Prof. Shephard's support in the data compilation and reduction phase will be necessary to the successful and expedient completion of this task. SAIC will sub-contract with Prof. Shephard through CORDA for the extraction of the remaining data from the set of combat operational analysis reports of artillery missions during World War II. Prior to beginning the extraction, SAIC will meet with Prof. Shephard and agree on a mutually acceptable format which will best support later analysis. The extracted data will contain artillery and aerial bombardment situation descriptions to include type of battery firing, number of tubes, type ammunition, number of rounds fired, duration of fire, the tactical situation, target terrain and vegetation, fire mission and constraints, type and activity of target units, and effects of fire such as personnel casualties, equipment damage, fire or movement suppression and their durations, and forced change of position.

b. Upon receipt of the extracted data from Prof. Shephard in the agreed format, SAIC will review and evaluate the data to determine if it is possible to reduce and reformat the data to a form which would be useful in (1) modeling of suppression due to fire support in division and theater-level models and (2) development of "benchmarks" or approximate standards (experiential levels) against which to judge artillery expenditure results from the models. The results of this review and evaluation along with the methodology for reducing and reformatting the data will be presented to the Technical Representative and the COR prior to progressing to the next sub-task. The government recognizes that completion of the statistical analyses depends on the usefulness of information representing the target effects of the artillery fires and bombardments. If the operational analysis reports are found to have inadequate or insufficient information on which to base estimates of the effects of the military operations, the government, in consultation with the contractor, will re-assess the usefulness of further analyses. Such a determination can be made only after data have been compiled for preliminary analysis by the contractor. Close and regular interaction between the government's Technical Representative and the contractor's Principal Investigator will result in early and prompt corrective action, if needed.

c. With the approval of the Technical Representative and the COR, SAIC will conduct such statistical analyses as are appropriate for the quantity and type of data compiled to achieve the task objective. More specifically, SAIC will create a data base and determine relations between suppression effects and measures of artillery or bombardment intensity, incorporating situation descriptors if possible. In addition, SAIC will define distributions of round expenditures and rates by the type situations or periods of time. SAIC will provide the data to the government in a format amenable to incorporation into division and theater-level models.

7. Government Furnished Data: Not applicable.

8. Deliverables:

It is anticipated that the work discussed above will take about 8 months to complete. Monthly letter-format progress reports will be provided to the Technical Representative and the Contracting Officer's Representative (below). Informal telephonic status reports will be provided to the TR at least every two weeks. A draft final report will be produced 8 months after task order award; the report will contain the compiled and reduced data used in the statistical analyses as well as the analytical results. Government comments will be given to the contractor within 15 calendar days of receipt of the draft final report; the contractor will deliver a final report within 30 calendar days of the government's comments. Within plus or minus 30 days of the delivery of the final report, an oral briefing on the methods and findings will be provided to the Concepts Analysis Agency and others.

9. Agency Support:

a. Contracting Officer's Representative (COR) is Mr. Eugene P. Visco, Director, Study Program Management Agency, Office of the Deputy Under Secretary of the Army (Operations Research), ATTN: SFUS-SPM, Room 3C567, Pentagon, Washington, DC 20310-0102, telephone (202) 697-0026.

b. The Technical Representative for this task is Dr. Robert L. Helmbold, US Army Concepts Analysis Agency, 8120 Woodmont Avenue, Bethesda, MD 20814-2797, telephone (301) 295-1669.

## APPENDIX C

### CORDA DATA SOURCE LIST

#### CATEGORY A : BOMBARDMENT/ACTION DETAILS

<u>Serial</u>	<u>References</u>	<u>Title</u>
A1.	AORG Memo 410	Effect of bombardment 13 Inf Bde attack 0530hrs 18 Jan 44. (Sep 44)
A2.	AORG Memo 411	Operation Panther - The crossing of the Garigliano, attack by 167 Bde. (Sep 44)
A3.	AORG Memo 412	Attack by 2 Bn Northamptonshire Regt on Point 156 on 30 Jan 44. (Sep 44)
A4.	AORG Report 261	Casualties and the effects of fire support on the British beaches in Normandy. (Apr 45)
A5.	AORG Report 264	Opposition encountered on the British beaches in Normandy on D Day. (Aug 45)
A6.	AORG Report 292	Comparison of British and American areas in Normandy in terms of fire support. (Aug 45)
A7.	AORG Report 299	The Westkappelle assault on Walcheren. (Oct 45)
A8.	No 1 ORS Draft Memo	Bombardment of Casino.
A9.	No 1 ORS Report 1/24	The effectiveness of artillery in Italy, 1944. (Nov 44)
A10.	No 1 ORS Report 1/25	The effect of artillery fire. (Dec 45)
A11.	No 1 ORS Report 1/30	Study of the preliminary bombardment on the New Zealand divisional front during the Eight Army attack across the Senio on 9 April 45. (Jun 45)
A12.	No 1 ORS Report	Effects of bombardment in Italy.
A13.		Operational VERITABLE.
A14.	No 2 ORS Report 5	Heavy Bombing in Operation CHARNWOOD.
A15.	No 2 ORS Report 6	Bombing in Operation GOODWOOD.
A16.	No 2 ORS Report 7	Bombing in Operation BLUECOAT. (Aug 44)
A17.	No 2 ORS Report 8	Operation "TOTALISE", RAF heavy bombing on night 7/8 Aug 44.

<u>Serial</u>	<u>Reference</u>	<u>Title</u>
A18.	No 2 ORS Report 14	Heavy bombing in support of the army. (Sep 44)
A19.	No 2 ORS Report 16	Air and ground support in the assault on Boulogne. Summary of the principal lessons. (Dec 44)
A20.	No 2 ORS Memorandum No 6	The contribution of the air forces to the stemming of the enemy thrust in the Ardennes. (Dec 44)
A21.	No 2 ORS Memorandum No 2	Bombing of the communications centres prior to operation "PLUNDER".
A22.	No 2 ORS/ORS 2TAF Joint Report No 3	Rocket firing typhoons in close support of military operations.
A23.	No 2 ORS Report No 25	The effect of various forms of fire support on the western defences of Walcheren. (Dec 44)
A24.	No 2 ORS Report No 29	Effect of counter-battery fire in Operation "VERITABLE". (Apr 45)
A25.	No 2 ORS Exrtract from Joint Report No 4 (with ORS 2TAF)	Artillery in the counter-flak programme in Operation "VARSITY".
A26.	No 2 ORS Report No 22	The effect of artillery fire on forward enemy defensive positions in the attack on Gailenkirchen (Operation "CLIPPER"). (Jan 45)
A27.	No 2 ORS Report No 26	Fire support in Operation "VERITABLE" - Effect on forward defensive positions. (Mar 45)
A28.	No 2 ORS Report No 1	Self-propelled artillery in the assault on the beaches. 3 Cdn Inf Div sector (Jul 44)
A29.	MORU Report 12	Battle study, the assault on Wesel. (Jul 46)
A30.	MORU Report 23	Operation Goodwood. (Oct 46)
A31.	DOR 44/117	Invasion of the Marshall Islands with details of bombardments. (Aug 44)
A32.	DOR 44/120	Comparison of different landing operations.
A33.	DOR 45/31	Land'ngs on Pacific atolls. (Mar 45)

<u>Serial</u>	<u>Reference</u>	<u>Title</u>
A34.	DOR 45/37	American landing on the South Pacific particularly in the Marshall Islands.
A35.	DTI 11/51	Direct air support of the army.
A36.	DTI RS/MS/27	Neutralisation of beach defences by bombing.
A37.	DTI 1/369	Neutralisation of beach defences by bombing.
A38.	DTI 5/1053 JTC (45) 24	Fire support in seaborne landings. (Jan 44 - Mar 45)
A39.	24/Gen/2431	Experiments on the effects of bombardment on the efficiency of men. (Jun 43). Includes paper by Lord Croft. (Feb 43)
A40.	DBR SA/6/111	Fear of enemy weapons.
A41.	HMSO	The development of artillery tactics and equipment. (1950)
A42.	No 1 ORS Report 1/9	The effect of counter battery fire. (Apr 44)
A43.		Fear - A field survey in Palestine. (1949)

CATEGORY B : INTERPRETIVE REPORTS/SUMMARIES

B1.	AORG Memo 535A	Material and morale effects of bombardment. (Jul 45)
B2.	AORG Memo 635	The morale effect of bombardment. (Nov 45)
B3.	No 1 ORS	Bombardment to break morale. (Feb 44)
B4.	No 1 ORS Report 1/24A	Effects of artillery fire in attacks in mountainous country. (Oct 44)
B5.	No 1 ORS	Probability of hitting targets with artillery fire. (Sep 44)
B6.	No 1 ORS Report	Area bombardment. (Feb 44)
B7.	No 2 ORS Memorandum No 7	The morale effects of artillery. (Apr 45)
B8.	MGRU Report 3	The effects of bombardment - the present state of knowledge. (Mar 46)
B9.	ORUFE Report 2/57	The probabilities of success in area bombardment (Mar 57)

<u>Serial</u>	<u>Reference</u>	<u>Title</u>
B10.	DOR 44/107	Gunnery appreciation for supporting fire in combined operations. (1944)
B11.	No 1 ORS	OR and artillery fire. (Feb 45)
B12.	COS(43) 796 (0)	Fire support of seaborne landings against a heavily defended coast. (Dec 43)
B13.	COS(43) 770 (0)	The "Graham Report" - Fire support of seaborne landings against a heavily defended coast. (Jan 44)
B14.	DTI	Extracts from report by an interservices committee on operations in Crete.
B15.	DTI 3/23	Operational reports: North Africa.
B16.	DTI 4/23	Operational reports: Sicily.
B17.	DTI 6/23	Operational reports: Italy.
B18.	DTI 11/23	Operational reports: Burma.
B19.	DTI 11/51	Direct air support of the Army.
B20.	DTI RS/MS/27	Neutralisation of beach defences by bombing.
B21.	DTI 1/369	Neutralisation of beach defences by bombing.
B22.	DTI 5/1053 JTC (45) 24	Fire support in seaborne landings
B23.	JTWC	Japanese morale.
B24.	86/Gen/5215	Informal Fire Effect Committee: Bombardment Sub-Committee. 1943-44
B25.	DOAE WP/64	The effect of weapons on morale. (Jan 68)
B26.	DOAE Item 612 WP 612/6	A discussion paper on the non-lethal effects of artillery fire. (Mar 78)
B27.		Second International Symposium on Military Operational Research. RMCS Shrivenham, Psychological stress and performance - Human Factors. S Labuc. (Sep 85)
B28.	RMCS R/78/690	The modelling of suppressive, neutralising and demoralising effects of weapons (1978)
B29.	RMCS R/84/1257	Battle shock.

<u>Serial</u>	<u>Reference</u>	<u>Title</u>
B30.	RMCS Technical Note OR/1	Method of assessing the relative morale effects of shells and warheads of different sizes. (Jun 74)
B31.		Protection against the ephemeral effects of bombardment. (Nov 83)
B32.	APRE 81R005	Psychological stress and combat efficiency - A review of the literature. (Sep 81)

## APPENDIX D

### USER'S GUIDE FOR THE DATA BASE

This user's guide assumes that the user is familiar with the commands used in dBASE III PLUS. Therefore, procedures are described in terms of commands instead of selections from the ASSIST menus.

#### SYSTEM REQUIREMENTS

1. SAIC used dBASE III PLUS to develop the three data base applications. That software package is designed to run on the IBM Personal Computer, PC XT, PC AT, and Personal System/2 machines, as well as the COMPAQ and other IBM-compatible microcomputers. The minimum computer memory required is 256K. Because computer memory is used as a working space during data manipulation, increased RAM can result in increased processing speed.
2. dBASE III PLUS requires MS-DOS or PC DOS Version 2.0 or later. The system should have either two floppy disk drives or one floppy disk drive and one hard disk drive. The computer program usually resides on one of the floppy disks or the hard disk, and the data base files are stored on the other floppy disk or on a different directory of the hard disk. A system with two floppy disk drives may be sufficient for handling small-to-medium-size data bases. However, for faster processing and larger data bases, a hard disk drive is highly recommended. Other hardware requirements include a printer with a capacity of at least 80 columns.

#### FILES

3. There are three data base files containing information from the abstracts:  
SERIAL.DBF  
TARGET.DBF  
PHASE.DBF

4. There are three program files used to print the contents of the data base:  
P\_SERIAL.PRG  
P\_TARGET.PRG  
P\_PHASE.PRG

Typing DO P\_SERIAL, for example, would print each record in the SERIAL data base file on a separate page. A label is printed for each field, with the contents of the field printed beside the label.

5. The data base and program files were provided to the U.S. Army Concepts Analysis Agency on two 5.25" double-sided, double-density diskettes. One of the diskettes contains the SERIAL.DBF, P\_SERIAL.PRG, TARGET.DBF, P\_TARGET.PRG, and USER.GDE files. The USER.GDE file is a DOS text file of this user's manual. The other diskette contains the PHASE.DBF and P\_PHASE.PRG files. Requests for copies of the diskettes should reference this report and be addressed to:

U.S. Army Concepts Analysis Agency  
8120 Woodmont Avenue  
Bethesda, MD 20814-2797

#### USING THE DATA BASE FILES

6. At the dot prompt, the user would type in USE SERIAL in order to enter the SERIAL data base file. If the user is interested in looking at the data for a particular serial number, the user can use the LOCATE command. For example, to locate the record containing serial data on serial number 11, the user would type LOCATE FOR SERIAL = "11". The user can then look at the data fields for that record by typing EDIT or pressing the F10 key.
7. If the user is interested in looking at the target data for a particular target of a particular serial number, then the user must first enter the TARGET data base file. Then, the user can use a LOCATE command to find the particular record. For example, to find the record for the second target of serial number 11, the user would type LOCATE FOR SERIAL = "11"

.AND. TGT\_NO = "2". Note that both the serial number and the target number must be enclosed in quotes because all fields in the three data base files are defined as character fields.

8. If the user is interested in looking at the phase data for a particular phase of a particular target of a particular serial number, the user must first enter the PHASE data base file. Then, the user can use a LOCATE command to find the particular record. For example, to find the record for the third phase of the second target of serial number 11, the user would type LOCATE FOR SERIAL = "11" .AND. TGT\_NO = "2" .AND. PHASE\_NO = "3". Note that the phase number must be enclosed in quotes.
9. If the user would like to display one or more fields in all of the records, the LIST command can be used. For example, to display the SERIAL and SUPPRESSN fields for all of the records in the SERIAL data base file, the command would be LIST SERIAL,SUPPRESSN ALL OFF. The "ALL" indicates all records, and the "OFF" indicates that the record number should not be displayed. To send the list to a printer, simply append TO PRINT to the end of the command. Displaying particular fields for all records would give the user some idea of the density of the data in those fields. The exact field names are listed in the data dictionary, which is presented as Table D-1.
10. At the present time, the data base files are linked only through the SERIAL, TGT\_NO, and PHASE\_NO fields. There is no way, for example, to directly retrieve the phase data corresponding to a target the user is looking at in the TARGET data base file. The user must exit the TARGET data base file, enter the PHASE data base file, and locate the records corresponding to the particular target. Any user who uses dBASE III PLUS on a regular basis, however, should have the knowledge to write a dBASE program which would perform the operation mentioned above.

TABLE D-1. DATA DICTIONARY

NAME	DATA BASE WIDTH	DEFINITION	SAMPLE VALUES
SERIAL	S, T, P	SAIC-ASSIGNED ID NUMBER	1
REF NO	S	CORDA REFERENCE NUMBER	A9
ORIG REF	S	ORIGINAL UKOR REPORT NAME	10MS 1/24CI
REF TITLE	S	ORIGINAL UKOR REPORT TITLE	THE EFFECTIVEMES OF ARTILLERY IN ITALY, 1944
DATA_SOURC	S	DATA SOURCE OF ENGAGEMENT INFORMATION	ACTION REPORT PLUS GROUND RECCE
SID1_CNTRY	S	NATIONALITY OF FRIENDLY UNITS ENGAGED	BRITAIN
SID1_UNITS	S	MILITARY DESIGNATION OF FRIENDLY UNITS	1 FD REGT
SID1_POSTR	S	POSTURE OF FRIENDLY UNITS	ATTACKING
SID2_CNTRY	S	NATIONALITY OF OPPONENTS ENGAGED	GERMANY
SID2_UNITS	S	MILITARY DESIGNATION OF OPPOSING UNITS	1 COY
SID2_POSTR	S	POSTURE OF OPPOSING UNITS	DEFENDING
DATE	S	DATE OF ENGAGEMENT	09/19/44
COUNTRY	S	COUNTRY IN WHICH ENGAGEMENT OCCURRED	ITALY
REGION	S	LOCAL REGION OF ENGAGEMENT	CASAGLIA
TERRAIN	S	DESCRIPTION OF TERRAIN CHARACTERISTICS	MOUNTAINOUS
WEATHER	S	DESCRIPTION OF WEATHER CONDITIONS	??
TIME	S, T, P	TIME ENGAGEMENT BEGAN	1700
SER_TACTICS	S	DESCRIPTION OF THE TACTICAL SITUATION	ATTACK 2 GERMAN POSITIONS (SLIT TRENCHES ON HILL TOPS)
NO_TGTS	S	THE NUMBER OF TARGETS ENGAGED	2
TGT_NO	T, P	THE NUMBER OF THE TARGET BEING ADDRESSED	1
NO_PH_PTGT	S	NUMBER OF FIRE PLAN PHASES FOR EACH TARGET	2/3
NO_PHASES	T	THE NUMBER OF PHASES FOR A TARGET	1
PHASE_NO	P	THE NUMBER OF THE PHASE BEING ADDRESSED	1
TARGET	S, T, P	DESCRIPTION OF TARGET	SLIT TRENCHES 1-2 FEET DEEP ON HILL TOPS
TGT_AREA	S, T, P	TARGET AREA OF BOMBARDMENT (YD <sup>2</sup> )	9000
BMB_TACTCS	S	TACTICS OF THE BOMBARDMENT	BOMBARD SLIT TRENCHES ON HILL TOPS
TGT_TACTCS	T	TACTICS OF THE TARGET	BOMBARD ONE SLIT TRENCH ON HILL TOP
PH_TACTCS	P	TACTICS OF THE PHASE	CONCENTRATION
FIRE_UNIT	S, T, P	MILITARY DESIGNATION OF FIRE UNITS	1 FD REGT
TYPE_WPNS	S, T, P	CODED LIST OF WEAPONS USED IN BOMBARDMENT	A
NO_TUBES	S, T, P	NUMBER OF EACH TYPE OF WEAPON USED	24A
TYPE_AMMO	S, T, P	TYPES OF AMMUNITION USED	HE199 CAP OFF (DIRECT ACTION)
RPG	S, T, P	NUMBER OF ROUNDS PER GUN FOR EACH TYPE OF WEAPON	18A
NO_ROUNDS	S, T, P	TOTAL NUMBER OF ROUNDS DELIVERED BY WEAPON TYPE	432A
FIRE_DURAT	S, T, P	DURATION OF BOMBARDMENT (MINUTES)	60

S = SERIAL DATA BASE  
T = TARGET DATA BASE  
P = PHASE DATA BASE

TABLE D-1. DATA DICTIONARY (CONTINUED)

<u>NAME</u>	<u>DATA BASE</u>	<u>WIDTH</u>	<u>DEFINITION</u>	<u>SAMPLE VALUES</u>
DELAY TIME	S, T, P	60	TIME BETWEEN END OF BOMBARDMENT AND INFANTRY ATTACK	15 MINUTES
O3J_TIME	S, T, P	60	TIME BETWEEN END OF BOMBARDMENT AND OBJECTIVE ACHIEVED	4 HOURS
CASUAL DAM	S, T, P	60	PERSONNEL CASUALTIES	23 KIA, 6 POW (GERMAN); NONE (BRITISH)
EQUIP DAM	S, T, P	50	EQUIPMENT DAMAGE	COMMAND POST AND 5 VEHICLES HIT
OTH_FACTRS	S, T, P	100	SIGNIFICANT FACTORS INFLUENCING RESULTS	GERMANS BOMBARDED WITH PAMPHLETS RECENTLY
OTH_RESULTS	S, T, P	80	CHANGE OF POSITION OR OTHER RESULTS	GERMANS WITHDREW
SUPPRESSN	S, T, P	200	FIRE OR MOVEMENT SUPPRESSION AND DURATION	GERMANS NEUTRALIZED
RPSY	S, T, P	80	ROUNDS PER SQUARE YARD	0.005A
RPSYPM	S, T, P	80	ROUNDS PER SQUARE YARD PER MINUTE	??
PPSY	S, T, P	80	POUNDS PER SQUARE YARD	0.125A
PPSYPM	S, T, P	80	POUNDS PER SQUARE YARD PER MINUTE	??
PPSY_E	S, T, P	80	POUNDS PER SQUARE YARD (EQUIVALENT)	0.125A
PPSYPM_E	S, T, P	80	POUNDS PER SQUARE YARD PER MINUTE (EQUIVALENT)	??

S = SERIAL DATA BASE  
T = TARGET DATA BASE  
P = PHASE DATA BASE

APPENDIX E

DATA BASE RECORDS

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## SERIAL

SERIAL: 1  
 REF NUMBER: A9  
 ORIG REF: IORS 1/24C1  
 REF TITLE: THE EFFECTIVENESS OF ARTILLERY IN ITALY, 1944  
 DATA SOURCE: ACTION REPORT PLUS GROUND RECCE

----- SERIAL DATA -----

SIDE 1 COUNTRY: BRITAIN  
 SIDE 1 UNITS: 1 FD REGT  
 SIDE 1 POSTURE: ATTACKING  
 SIDE 2 COUNTRY: GERMANY  
 SIDE 2 UNITS: 1 COY  
 SIDE 2 POSTURE: DEFENDING

DATE OF ACTION: 09/19/44  
 COUNTRY: ITALY  
 REGION: CASAGLIA  
 TERRAIN: MOUNTAINOUS  
 WEATHER: ??  
 TIME: 1700

SERIAL TACTICS: ATTACK 2 GERMAN POSITIONS (SLIT TRENCHES ON HILL TOPS) WITH SUPPORTING ARTILLERY  
 NO. BMBRD TARGETS: 1  
 NO. PHASES/TGT: 1

----- TARGET DATA -----

BOMBARD TARGET: PHASE LEVEL  
 BOMBARD TGT AREA: PHASE LEVEL  
 BOMBARD TACTICS: TARGET LEVEL

----- FIRING DATA -----

FIRE UNIT: PHASE LEVEL  
 TYPE WEAPONS: PHASE LEVEL  
 NUMBER TUBES: PHASE LEVEL  
 TYPE AMMO: PHASE LEVEL  
 ROUNDS PER GUN: PHASE LEVEL  
 NUMBER ROUNDS: PHASE LEVEL  
 FIRE DURATION: TARGET LEVEL AND PHASE LEVEL

----- RESULTS DATA -----

ATTACK DELAY TIME: ??  
 TIME TO OBJECTIVE: ??  
 CASUALTIES: 23 CASUALTIES, 6 POW (GERMAN); ?? (BRITISH)  
 EQUIPMENT DAMAGE: ??; ??  
 OTHER FACTORS: GERMANS HAD BEEN BOMBARDED WITH PAMPHLETS RECENTLY

OTHER RESULTS: MOST OF THE GERMANS WITHDREW  
 SUPPRESSION: GERMANS NEUTRALIZED; POWS SEVERELY SHAKEN WHEN CAPTURED 8.5 HOURS AFTER FIRING CEASED; LACK OF COVER, AIRBURSTS, HIGH LOCAL ROUND CONCENTRATION INCREASED EFFECT OF ARTILLERY

----- CALCULATED DATA -----

RDS/SQ YD: PHASE LEVEL  
 RDS/SQ YD/MIN: PHASE LEVEL  
 LBS/SQ YD: PHASE LEVEL  
 LBS/SQ YD/MIN: PHASE LEVEL  
 LBS/SQ YD (EQ): PHASE LEVEL  
 LBS/SQ YD/MIN (EQ): PHASE LEVEL

## TARGET

SERIAL:	1
TARGET NUMBER:	1
NUMBER PHASES:	1
TIME:	1700
----- TARGET DATA -----	
TARGET:	PHASE LEVEL
TARGET AREA:	PHASE LEVEL
TARGET TACTICS:	BOMBARD SLIT TRENCHES ON HILL TOPS
----- FIRING DATA -----	
FIRE UNIT:	PHASE LEVEL
TYPE WEAPONS:	PHASE LEVEL
NUMBER TUBES:	PHASE LEVEL
TYPE AMMO:	PHASE LEVEL
ROUNDS PER GUN:	PHASE LEVEL
NUMBER ROUNDS:	PHASE LEVEL
FIRE DURATION:	60
----- RESULTS DATA -----	
ATTACK DELAY TIME:	SERIAL LEVEL
TIME TO OBJECTIVE:	SERIAL LEVEL
CASUALTIES:	SERIAL LEVEL
EQUIPMENT DAMAGE:	SERIAL LEVEL
OTHER FACTORS:	SERIAL LEVEL
OTHER RESULTS:	SERIAL LEVEL
SUPPRESSION:	SERIAL LEVEL
----- CALCULATED DATA -----	
RDS/SQ YD:	PHASE LEVEL
RDS/SQ YD/MIN:	PHASE LEVEL
LBS/SQ YD:	PHASE LEVEL
LBS/SQ YD/MIN:	PHASE LEVEL
LBS/SQ YD (EQ):	PHASE LEVEL
LBS/SQ YD/MIN (EQ):	PHASE LEVEL

## PHASE

SERIAL:	1
TARGET NUMBER:	1
PHASE NUMBER:	1
TIME:	1700
----- TARGET DATA -----	
TARGET:	SLIT TRENCHES 1-2 FEET DEEP ON HILL TOPS
TARGET AREA:	90000
PHASE TACTICS:	CONCENTRATION
----- FIRING DATA -----	
FIRE UNIT:	1 FD REGT
TYPE WEAPONS:	A
NUMBER TUBES:	24A
TYPE AMMO:	HE199 CAP OFF (DIRECT ACTION) A
ROUNDS PER GUN:	18A
NUMBER ROUNDS:	432A
FIRE DURATION:	60
----- RESULTS DATA -----	
ATTACK DELAY TIME:	SERIAL LEVEL
TIME TO OBJECTIVE:	SERIAL LEVEL
CASUALTIES:	SERIAL LEVEL
EQUIPMENT DAMAGE:	SERIAL LEVEL
OTHER FACTORS:	SERIAL LEVEL
OTHER RESULTS:	SERIAL LEVEL
SUPPRESSION:	SERIAL LEVEL
----- CALCULATED DATA -----	
RDS/SQ YD:	0.005A
RDS/SQ YD/MIN:	??A
LBS/SQ YD:	0.125A
LBS/SQ YD/MIN:	??A
LBS/SQ YD (EQ):	0.125A
LBS/SQ YD/MIN (EQ):	??A

## SERIAL

SERIAL: 2  
REF NUMBER: A9  
ORIG REF: IORS 1/24C2  
REF TITLE: THE EFFECTIVENESS OF ARTILLERY IN ITALY, 1944  
DATA SOURCE: ACTION REPORT PLUS GROUND RECCE

----- SERIAL DATA -----

SIDE 1 COUNTRY: BRITAIN  
SIDE 1 UNITS: ??  
SIDE 1 POSTURE: ATTACKING  
SIDE 2 COUNTRY: GERMANY  
SIDE 2 UNITS: ??  
SIDE 2 POSTURE: DEFENDING

DATE OF ACTION: 09/24/44  
COUNTRY: ITALY  
REGION: S MARTINO IN GATTARA  
TERRAIN: STEEPLY SLOPING; SHRUBS AND SCATTERED SMALL TREES  
WEATHER: ??  
TIME: 1500

SERIAL TACTICS: INFANTRY WERE TO ADVANCE 15 MINUTES AFTER ARTILLERY BOMBARDMENT

NO. BMBRD TARGETS: 3  
NO. PHASES/TGT: 3/3/3

----- TARGET DATA -----

BOMBARD TARGET: TARGET LEVEL

BOMBARD TGT AREA: TARGET LEVEL  
BOMBARD TACTICS: TARGET LEVEL

----- FIRING DATA -----

FIRE UNIT: PHASE LEVEL  
TYPE WEAPONS: PHASE LEVEL  
NUMBER TUBES: PHASE LEVEL  
TYPE AMMO: PHASE LEVEL  
ROUNDS PER GUN: PHASE LEVEL  
NUMBER ROUNDS: PHASE LEVEL  
FIRE DURATION: TARGET LEVEL AND PHASE LEVEL

----- RESULTS DATA -----

ATTACK DELAY TIME: 15 MINUTES (PLANNED)  
TIME TO OBJECTIVE: 15 MINUTES  
CASUALTIES: UNKNOWN (GERMAN); ?? (BRITISH)  
EQUIPMENT DAMAGE: ??; ??  
OTHER FACTORS: GERMANS HAD ORDERS TO WITHDRAW IF HEAVILY SHELLED

OTHER RESULTS: GERMAN POSITION WAS FOUND TO BE EVACUATED  
SUPPRESSION: GERMANS WERE PROBABLY JUST OBEYING ORDERS IN WITHDRAWING

----- CALCULATED DATA -----

RDS/SQ YD: TARGET LEVEL  
RDS/SQ YD/MIN: TARGET LEVEL  
LBS/SQ YD: TARGET LEVEL  
LBS/SQ YD/MIN: TARGET LEVEL  
LBS/SQ YD (EQ): TARGET LEVEL  
LBS/SQ YD/MIN (EQ): TARGET LEVEL

## TARGET

SERIAL	2
TARGET NUMBER	1
NUMBER PHASES	3
TIME	1500
----- TARGET DATA -----	
TARGET	MG POSITION IN SOFT COVER, BUT NOT DUG IN
TARGET AREA	00000
TARGET TACTICS	BOMBARD MG POSITION ON STEEPLY SLOPING GROUND
----- FIRING DATA -----	
FIRE UNIT	PHASE LEVEL
TYPE WEAPONS	PHASE LEVEL
NUMBER TUBES	PHASE LEVEL
TYPE AMMO	PHASE LEVEL
ROUNDS PER GUN	PHASE LEVEL
NUMBER ROUNDS	PHASE LEVEL
FIRE DURATION	15
----- RESULTS DATA -----	
ATTACK DELAY TIME	SERIAL LEVEL
TIME TO OBJECTIVE	SERIAL LEVEL
CASUALTIES	SERIAL LEVEL
EQUIPMENT DAMAGE	SERIAL LEVEL
OTHER FACTORS	SERIAL LEVEL
OTHER RESULTS	SERIAL LEVEL
SUPPRESSION	SERIAL LEVEL
----- CALCULATED DATA -----	
RO/SG YD	0 00328A
RO/SG YD/MIN	??A
LB/SG YD	0 082A
LB/SG YD/MIN	??A
LB/SG YD (EQ)	0 082A
LB/SG YD/MIN (EQ)	??A

## PHASE

SERIAL	2
TARGET NUMBER	1
PHASE NUMBER	1
TIME	1500
----- TARGET DATA -----	
TARGET	TARGET LEVEL
TARGET AREA	TARGET LEVEL
PHASE TACTICS	CONCENTRATION
----- FIRING DATA -----	
FIRE UNIT	??
TYPE WEAPONS	A
NUMBER TUBES	18A
TYPE AMMO	ME 19 (DIRECT ACTION) A
ROUNDS PER GUN	15A
NUMBER ROUNDS	240A
FIRE DURATION	8
----- RESULTS DATA -----	
ATTACK DELAY TIME	SERIAL LEVEL
TIME TO OBJECTIVE	SERIAL LEVEL
CASUALTIES	SERIAL LEVEL
EQUIPMENT DAMAGE	SERIAL LEVEL
OTHER FACTORS	SERIAL LEVEL
OTHER RESULTS	SERIAL LEVEL
SUPPRESSION	SERIAL LEVEL
----- CALCULATED DATA -----	
RO/SG YD	TARGET LEVEL
RO/SG YD/MIN	TARGET LEVEL
LB/SG YD	TARGET LEVEL
LB/SG YD/MIN	TARGET LEVEL
LB/SG YD (EQ)	TARGET LEVEL
LB/SG YD/MIN (EQ)	TARGET LEVEL

## PHASE

SERIAL:	2
TARGET NUMBER:	1
PHASE NUMBER:	2
TIME:	1505
----- TARGET DATA -----	
TARGET:	TARGET LEVEL
TARGET AREA:	TARGET LEVEL
PHASE TACTICS:	CONCENTRATION
----- FIRING DATA -----	
FIRE UNIT:	??
TYPE WEAPONS:	A
NUMBER TUBES:	16A
TYPE AMMO:	HE119 (DIRECT ACTION) A
ROUNDS PER GUN:	14A
NUMBER ROUNDS:	224A
FIRE DURATION:	7
----- RESULTS DATA -----	
ATTACK DELAY TIME:	SERIAL LEVEL
TIME TO OBJECTIVE:	SERIAL LEVEL
CASUALTIES:	SERIAL LEVEL
EQUIPMENT DAMAGE:	SERIAL LEVEL
OTHER FACTORS:	SERIAL LEVEL
OTHER RESULTS:	SERIAL LEVEL
SUPPRESSION:	SERIAL LEVEL
----- CALCULATED DATA -----	
RDS/SQ YD:	TARGET LEVEL
RDS/SQ YD/MIN:	TARGET LEVEL
LBS/SQ YD:	TARGET LEVEL
LBS/SQ YD/MIN:	TARGET LEVEL
LBS/SQ YD (EQ):	TARGET LEVEL
LBS/SQ YD/MIN (EQ):	TARGET LEVEL

## PHASE

SERIAL:	2
TARGET NUMBER:	1
PHASE NUMBER:	3
TIME:	1512
----- TARGET DATA -----	
TARGET:	TARGET LEVEL
TARGET AREA:	TARGET LEVEL
PHASE TACTICS:	CONCENTRATION
----- FIRING DATA -----	
FIRE UNIT:	??
TYPE WEAPONS:	A
NUMBER TUBES:	16A
TYPE AMMO:	HE119 (DIRECT ACTION) A
ROUNDS PER GUN:	12A
NUMBER ROUNDS:	192A
FIRE DURATION:	3
----- RESULTS DATA -----	
ATTACK DELAY TIME:	SERIAL LEVEL
TIME TO OBJECTIVE:	SERIAL LEVEL
CASUALTIES:	SERIAL LEVEL
EQUIPMENT DAMAGE:	SERIAL LEVEL
OTHER FACTORS:	SERIAL LEVEL
OTHER RESULTS:	SERIAL LEVEL
SUPPRESSION:	SERIAL LEVEL
----- CALCULATED DATA -----	
RDS/SQ YD	TARGET LEVEL
RDS/SQ YD/MIN	TARGET LEVEL
LBS/SQ YD	TARGET LEVEL
LBS/SQ YD/MIN	TARGET LEVEL
LBS/SQ YD (EQ)	TARGET LEVEL
LBS/SQ YD/MIN (EQ)	TARGET LEVEL

## TARGET

SERIAL:	2
TARGET NUMBER:	2
NUMBER PHASES:	3
TIME:	1500
----- TARGET DATA -----	
TARGET:	MG POSITION IN SOFT COVER, BUT NOT DUG IN
TARGET AREA:	200000
TARGET TACTICS:	BOMBARD MG POSITION ON STEEPLY SLOPING GROUND
----- FIRING DATA -----	
FIRE UNIT:	PHASE LEVEL
TYPE WEAPONS:	PHASE LEVEL
NUMBER TUBES:	PHASE LEVEL
TYPE AMMO:	PHASE LEVEL
ROUNDS PER GUN:	PHASE LEVEL
NUMBER ROUNDS:	PHASE LEVEL
FIRE DURATION:	15
----- RESULTS DATA -----	
ATTACK DELAY TIME:	SERIAL LEVEL
TIME TO OBJECTIVE:	SERIAL LEVEL
CASUALTIES:	SERIAL LEVEL
EQUIPMENT DAMAGE:	SERIAL LEVEL
OTHER FACTORS:	SERIAL LEVEL
OTHER RESULTS:	SERIAL LEVEL
SUPPRESSION:	SERIAL LEVEL
----- CALCULATED DATA -----	
RDS/SQ YD:	0.00164A,0.00104F
RDS/SQ YD/MIN:	??A,??F
LBS/SQ YD:	0.041A,0.0032F
LBS/SQ YD/MIN:	??A,??F
LBS/SQ YD (EQ):	0.041A,0.0031F
LBS/SQ YD/MIN (EQ):	??A,??F

## PHASE

SERIAL:	2
TARGET NUMBER:	2
PHASE NUMBER:	1
TIME:	1500
----- TARGET DATA -----	
TARGET:	TARGET LEVEL
TARGET AREA:	TARGET LEVEL
PHASE TACTICS:	CONCENTRATION
----- FIRING DATA -----	
FIRE UNIT:	??
TYPE WEAPONS:	A,F
NUMBER TUBES:	8A,8F
TYPE AMMO:	HE119 (DIRECT ACTION) A,??F
ROUNDS PER GUN:	15A,10F
NUMBER ROUNDS:	120A,80F
FIRE DURATION:	5
----- RESULTS DATA -----	
ATTACK DELAY TIME:	SERIAL LEVEL
TIME TO OBJECTIVE:	SERIAL LEVEL
CASUALTIES:	SERIAL LEVEL
EQUIPMENT DAMAGE:	SERIAL LEVEL
OTHER FACTORS:	SERIAL LEVEL
OTHER RESULTS:	SERIAL LEVEL
SUPPRESSION:	SERIAL LEVEL
----- CALCULATED DATA -----	
RDS/SQ YD:	TARGET LEVEL
RDS/SQ YD/MIN:	TARGET LEVEL
LBS/SQ YD:	TARGET LEVEL
LBS/SQ YD/MIN:	TARGET LEVEL
LBS/SQ YD (EQ):	TARGET LEVEL
LBS/SQ YD/MIN (EQ):	TARGET LEVEL

## PHASE

SERIAL:	2
TARGET NUMBER:	2
PHASE NUMBER:	2
TIME:	1505
----- TARGET DATA -----	
TARGET:	TARGET LEVEL
TARGET AREA:	TARGET LEVEL
PHASE TACTICS:	CONCENTRATION
----- FIRING DATA -----	
FIRE UNIT:	??
TYPE WEAPONS:	A,F
NUMBER TUBES:	8A,8F
TYPE AMMO:	HE119 (DIRECT ACTION) A.??F
ROUNDS PER GUN:	14A,7F
NUMBER ROUNDS:	112A,56F
FIRE DURATION:	7
----- RESULTS DATA -----	
ATTACK DELAY TIME:	SERIAL LEVEL
TIME TO OBJECTIVE:	SERIAL LEVEL
CASUALTIES:	SERIAL LEVEL
EQUIPMENT DAMAGE:	SERIAL LEVEL
OTHER FACTORS:	SERIAL LEVEL
OTHER RESULTS:	SERIAL LEVEL
SUPPRESSION:	SERIAL LEVEL
----- CALCULATED DATA -----	
RDS/SQ YD:	TARGET LEVEL
RDS/SQ YD/MIN:	TARGET LEVEL
LBS/SQ YD:	TARGET LEVEL
LBS/SQ YD/MIN:	TARGET LEVEL
LBS/SQ YD (EQ):	TARGET LEVEL
LBS/SQ YD/MIN (EQ):	TARGET LEVEL

## PHASE

SERIAL:	2
TARGET NUMBER:	2
PHASE NUMBER:	3
TIME:	1512
----- TARGET DATA -----	
TARGET:	TARGET LEVEL
TARGET AREA:	TARGET LEVEL
PHASE TACTICS:	CONCENTRATION
----- FIRING DATA -----	
FIRE UNIT:	??
TYPE WEAPONS:	A,F
NUMBER TUBES:	8A,8F
TYPE AMMO:	HE119 (DIRECT ACTION) A.??F
ROUNDS PER GUN:	12A,9F
NUMBER ROUNDS:	98A,72F
FIRE DURATION:	3
----- RESULTS DATA -----	
ATTACK DELAY TIME:	SERIAL LEVEL
TIME TO OBJECTIVE:	SERIAL LEVEL
CASUALTIES:	SERIAL LEVEL
EQUIPMENT DAMAGE:	SERIAL LEVEL
OTHER FACTORS:	SERIAL LEVEL
OTHER RESULTS:	SERIAL LEVEL
SUPPRESSION:	SERIAL LEVEL
----- CALCULATED DATA -----	
RDS/SQ YD:	TARGET LEVEL
RDS/SQ YD/MIN:	TARGET LEVEL
LBS/SQ YD:	TARGET LEVEL
LBS/SQ YD/MIN:	TARGET LEVEL
LBS/SQ YD (EQ):	TARGET LEVEL
LBS/SQ YD/MIN (EQ):	TARGET LEVEL

## TARGET

SERIAL: 2  
TARGET NUMBER: 3  
NUMBER PHASES: 3  
TIME: 1500

----- TARGET DATA -----  
TARGET: MG POSITION IN SOFT COVER, BUT NOT DUG IN

TARGET AREA: 200000  
TARGET TACTICS: BOMBARD MG POSITION ON STEEPLY SLOPING GROUND

----- FIRING DATA -----  
FIRE UNIT: PHASE LEVEL  
TYPE WEAPONS: PHASE LEVEL  
NUMBER TUBES: PHASE LEVEL  
TYPE AMMO: PHASE LEVEL  
ROUNDS PER GUN: PHASE LEVEL  
NUMBER ROUNDS: PHASE LEVEL  
FIRE DURATION: 15

----- RESULTS DATA -----  
ATTACK DELAY TIME: SERIAL LEVEL  
TIME TO OBJECTIVE: SERIAL LEVEL  
CASUALTIES: SERIAL LEVEL  
EQUIPMENT DAMAGE: SERIAL LEVEL  
OTHER FACTORS: SERIAL LEVEL

OTHER RESULTS: SERIAL LEVEL  
SUPPRESSION: SERIAL LEVEL

----- CALCULATED DATA -----  
RDS/SQ YD: 0.00164A, 0.00104F  
RDS/SQ YD/MIN: ??A, ??F  
LBS/SQ YD: 0.041A, 0.0832F  
LBS/SQ YD/MIN: ??A, ??F  
LBS/SQ YD (EQ): 0.041A, 0.0891F  
LBS/SQ YD/MIN (EQ): ??A, ??F

## PHASE

SERIAL: 2  
TARGET NUMBER: 3  
PHASE NUMBER: 1  
TIME: 1500

----- TARGET DATA -----  
TARGET: TARGET LEVEL

TARGET AREA: TARGET LEVEL  
PHASE TACTICS: CONCENTRATION

----- FIRING DATA -----  
FIRE UNIT: ??  
TYPE WEAPONS: A, F  
NUMBER TUBES: 8A, 8F  
TYPE AMMO: HE119 (DIRECT ACTION) A, ??F  
ROUNDS PER GUN: 15A, 10F  
NUMBER ROUNDS: 120A, 80F  
FIRE DURATION: 5

----- RESULTS DATA -----  
ATTACK DELAY TIME: SERIAL LEVEL  
TIME TO OBJECTIVE: SERIAL LEVEL  
CASUALTIES: SERIAL LEVEL  
EQUIPMENT DAMAGE: SERIAL LEVEL  
OTHER FACTORS: SERIAL LEVEL

OTHER RESULTS: SERIAL LEVEL  
SUPPRESSION: SERIAL LEVEL

----- CALCULATED DATA -----  
RDS/SQ YD: TARGET LEVEL  
RDS/SQ YD/MIN: TARGET LEVEL  
LBS/SQ YD: TARGET LEVEL  
LBS/SQ YD/MIN: TARGET LEVEL  
LBS/SQ YD (EQ): TARGET LEVEL  
LBS/SQ YD/MIN (EQ): TARGET LEVEL

## PHASE

SERIAL:	2
TARGET NUMBER:	3
PHASE NUMBER:	2
TIME:	1505
----- TARGET DATA -----	
TARGET:	TARGET LEVEL
TARGET AREA:	TARGET LEVEL
PHASE TACTICS:	CONCENTRATION
----- FIRING DATA -----	
FIRE UNIT:	??
TYPE WEAPONS:	A,F
NUMBER TUBES:	8A,8F
TYPE AMMO:	HE119 (DIRECT ACTION) A,??F
ROUNDS PER GUN:	14A,7F
NUMBER ROUNDS:	112A,56F
FIRE DURATION:	7
----- RESULTS DATA -----	
ATTACK DELAY TIME:	SERIAL LEVEL
TIME TO OBJECTIVE:	SERIAL LEVEL
CASUALTIES:	SERIAL LEVEL
EQUIPMENT DAMAGE:	SERIAL LEVEL
OTHER FACTORS:	SERIAL LEVEL
OTHER RESULTS:	SERIAL LEVEL
SUPPRESSION:	SERIAL LEVEL
----- CALCULATED DATA -----	
RDS/SQ YD:	TARGET LEVEL
RDS/SQ YD/MIN:	TARGET LEVEL
LBS/SQ YD:	TARGET LEVEL
LBS/SQ YD/MIN:	TARGET LEVEL
LBS/SQ YD (EQ):	TARGET LEVEL
LBS/SQ YD/MIN (EQ):	TARGET LEVEL

## PHASE

SERIAL:	2
TARGET NUMBER:	3
PHASE NUMBER:	3
TIME:	1512
----- TARGET DATA -----	
TARGET:	TARGET LEVEL
TARGET AREA:	TARGET LEVEL
PHASE TACTICS:	CONCENTRATION
----- FIRING DATA -----	
FIRE UNIT:	??
TYPE WEAPONS:	A,F
NUMBER TUBES:	8A,8F
TYPE AMMO:	HE119 (DIRECT ACTION) A,??F
ROUNDS PER GUN:	12A,9F
NUMBER ROUNDS:	96A,72F
FIRE DURATION:	3
----- RESULTS DATA -----	
ATTACK DELAY TIME:	SERIAL LEVEL
TIME TO OBJECTIVE:	SERIAL LEVEL
CASUALTIES:	SERIAL LEVEL
EQUIPMENT DAMAGE:	SERIAL LEVEL
OTHER FACTORS:	SERIAL LEVEL
OTHER RESULTS:	SERIAL LEVEL
SUPPRESSION:	SERIAL LEVEL
----- CALCULATED DATA -----	
RDS/SQ YD:	TARGET LEVEL
RDS/SQ YD/MIN:	TARGET LEVEL
LBS/SQ YD:	TARGET LEVEL
LBS/SQ YD/MIN:	TARGET LEVEL
LBS/SQ YD (EQ):	TARGET LEVEL
LBS/SQ YD/MIN (EQ):	TARGET LEVEL



## SERIAL

SERIAL: 3  
 REF NUMBER: A9  
 ORIG REF: IORS 1/24C3  
 REF TITLE: THE EFFECTIVENESS OF ARTILLERY IN ITALY, 1944  
 DATA SOURCE: ACTION REPORT PLUS GROUND RECCE

----- SERIAL DATA -----

SIDE 1 COUNTRY: BRITAIN  
 SIDE 1 UNITS: 1 FO REGT, 1 MD REGT  
 SIDE 1 POSTURE: ATTACKING  
 SIDE 2 COUNTRY: GERMANY  
 SIDE 2 UNITS: ??  
 SIDE 2 POSTURE: DEFENDING

DATE OF ACTION: 09/24/44  
 COUNTRY: ITALY  
 REGION: S MARTINO IN GATTARA  
 TERRAIN: HARD AND ROCKY GROUND ON WOODED TOP OF HILL  
 WEATHER: ??  
 TIME: ??

SERIAL TACTICS: BRITISH INFANTRY WERE TO ATTACK AFTER AN ARTILLERY BOMBARDMENT

NO. BMBRD TARGETS: 1  
 NO. PHASES/TGT: 3

----- TARGET DATA -----

BOMBARD TARGET: TARGET LEVEL  
 BOMBARD TGT AREA: TARGET LEVEL  
 BOMBARD TACTICS: TARGET LEVEL

----- FIRING DATA -----

FIRE UNIT: PHASE LEVEL  
 TYPE WEAPONS: PHASE LEVEL  
 NUMBER TUBES: PHASE LEVEL  
 TYPE AMMO: PHASE LEVEL  
 ROUNDS PER GUN: PHASE LEVEL  
 NUMBER ROUNDS: PHASE LEVEL  
 FIRE DURATION: TARGET LEVEL AND PHASE LEVEL

----- RESULTS DATA -----

ATTACK DELAY TIME: ??  
 TIME TO OBJECTIVE: 15 MIN TO CONTACT (OBJECTIVE NEVER CAPTURED)  
 CASUALTIES: UNKNOWN (GERMAN); 4 KIA, 5 WIA (BRITISH)  
 EQUIPMENT DAMAGE: ??; ??  
 OTHER FACTORS: NONE

OTHER RESULTS: INFANTRY ATTACK STOPPED 40 METERS FROM OBJECTIVE BY MG FIRE  
 SUPPRESSION: MOST OF THE SHELLS WERE AIRBURSTS; EFFECT OF FIRING ON TROOPS IN REFUGEE TRENCHES WAS SLIGHT; NO EVIDENCE THAT ARTILLERY HAD ANY MORALE EFFECT

----- CALCULATED DATA -----

RDS/SQ YD: TARGET LEVEL  
 RDS/SQ YD/MIN: TARGET LEVEL  
 LBS/SQ YD: TARGET LEVEL  
 LBS/SQ YD/MIN: TARGET LEVEL  
 LBS/SQ YD (EQ): TARGET LEVEL  
 LBS/SQ YD/MIN (EQ): TARGET LEVEL

## TARGET

SERIAL: 3  
TARGET NUMBER: 1  
NUMBER PHASES: 3  
TIME: 77

----- TARGET DATA -----  
TARGET: 4 WEAPON PITS AND 3 REFUGE TRENCHES ON WOODDED HILL

TARGET AREA: 120000  
TARGET TACTICS: BOMBARD POSITION ON WOODDED HILL

----- FIRING DATA -----  
FIRE UNIT: PHASE LEVEL  
TYPE WEAPONS: PHASE LEVEL  
NUMBER TUBES: PHASE LEVEL  
TYPE AMMO: PHASE LEVEL  
ROUNDS PER GUN: PHASE LEVEL  
NUMBER ROUNDS: PHASE LEVEL  
FIRE DURATION: 24

----- RESULTS DATA -----  
ATTACK DELAY TIME: SERIAL LEVEL  
TIME TO OBJECTIVE: SERIAL LEVEL  
CASUALTIES: SERIAL LEVEL  
EQUIPMENT DAMAGE: SERIAL LEVEL  
OTHER FACTORS: SERIAL LEVEL

OTHER RESULTS: SERIAL LEVEL  
SUPPRESSION: SERIAL LEVEL

----- CALCULATED DATA -----  
RDS/SQ YD: 0.0032A,0.00107F  
RDS/SQ YD/MIN: ??A,??F  
LBS/SQ YD: 0.08A,0.09F  
LBS/SQ YD/MIN: ??A,??F  
LBS/SQ YD (EQ): 0.08A,0.075F  
LBS/SQ YD/MIN (EQ): ??A,??F

## PHASE

SERIAL: 3  
TARGET NUMBER: 1  
PHASE NUMBER: 1  
TIME: H-30

----- TARGET DATA -----  
TARGET: TARGET LEVEL

TARGET AREA: TARGET LEVEL  
PHASE TACTICS: CONCENTRATION

----- FIRING DATA -----  
FIRE UNIT: 1 FO REGT, 1 MO REGT  
TYPE WEAPONS: A,F  
NUMBER TUBES: 24A,16F  
TYPE AMMO: HE119 CAP OFF (DIRECT ACTION) A,HE222 AIRBURST F  
ROUNDS PER GUN: 6A,3F  
NUMBER ROUNDS: 144A,48F  
FIRE DURATION: 3

----- RESULTS DATA -----  
ATTACK DELAY TIME: SERIAL LEVEL  
TIME TO OBJECTIVE: SERIAL LEVEL  
CASUALTIES: SERIAL LEVEL  
EQUIPMENT DAMAGE: SERIAL LEVEL  
OTHER FACTORS: SERIAL LEVEL

OTHER RESULTS: SERIAL LEVEL  
SUPPRESSION: SERIAL LEVEL

----- CALCULATED DATA -----  
RDS/SQ YD: TARGET LEVEL  
RDS/SQ YD/MIN: TARGET LEVEL  
LBS/SQ YD: TARGET LEVEL  
LBS/SQ YD/MIN: TARGET LEVEL  
LBS/SQ YD (EQ): TARGET LEVEL  
LBS/SQ YD/MIN (EQ): TARGET LEVEL

## PHASE

```

SERIAL:          3
TARGET NUMBER:  1
PHASE NUMBER:   2
TIME:           M-19
-----
TARGET:         TARGET DATA -----
                TARGET LEVEL

TARGET AREA:    TARGET LEVEL
PHASE TACTICS:  CONCENTRATION

-----
                FIRING DATA -----
FIRE UNIT:      1 FD REGT.1 MD REGT
TYPE WEAPONS:   A.F
NUMBER TUBES:   24A.16F
TYPE AMMO:      HE119 CAP OFF (DIRECT ACTION) A,HE222 AIRBURST F
ROUNDS PER GUN: 6A.3F
NUMBER ROUNDS:  144A.48F
FIRE DURATION:  3

-----
                RESULTS DATA -----
ATTACK DELAY TIME: SERIAL LEVEL
TIME TO OBJECTIVE: SERIAL LEVEL
CASUALTIES:     SERIAL LEVEL
EQUIPMENT DAMAGE: SERIAL LEVEL
OTHER FACTORS:  SERIAL LEVEL

OTHER RESULTS:  SERIAL LEVEL
SUPPRESSION:    SERIAL LEVEL

-----
                CALCULATED DATA -----
RDS/SQ YD:      TARGET LEVEL
RDS/SQ YD/MIN:  TARGET LEVEL
LBS/SQ YD:      TARGET LEVEL
LBS/SQ YD/MIN:  TARGET LEVEL
LBS/SQ YD (EQ): TARGET LEVEL
LBS/SQ YD/MIN (EQ): TARGET LEVEL
    
```

## PHASE

```

SERIAL:          3
TARGET NUMBER:  1
PHASE NUMBER:   3
TIME:           M-8
-----
TARGET:         TARGET DATA -----
                TARGET LEVEL

TARGET AREA:    TARGET LEVEL
PHASE TACTICS:  CONCENTRATION

-----
                FIRING DATA -----
FIRE UNIT:      1 FD REGT.1 MD REGT
TYPE WEAPONS:   A.F
NUMBER TUBES:   24A.16F
TYPE AMMO:      HE119 CAP OFF (DIRECT ACTION) A,HE222 AIRBURST F
ROUNDS PER GUN: 4A.2F
NUMBER ROUNDS:  96A.32F
FIRE DURATION:  2

-----
                RESULTS DATA -----
ATTACK DELAY TIME: SERIAL LEVEL
TIME TO OBJECTIVE: SERIAL LEVEL
CASUALTIES:     SERIAL LEVEL
EQUIPMENT DAMAGE: SERIAL LEVEL
OTHER FACTORS:  SERIAL LEVEL

OTHER RESULTS:  SERIAL LEVEL
SUPPRESSION:    SERIAL LEVEL

-----
                CALCULATED DATA -----
RDS/SQ YD:      TARGET LEVEL
RDS/SQ YD/MIN:  TARGET LEVEL
LBS/SQ YD:      TARGET LEVEL
LBS/SQ YD/MIN:  TARGET LEVEL
LBS/SQ YD (EQ): TARGET LEVEL
LBS/SQ YD/MIN (EQ): TARGET LEVEL
    
```



SERIAL

SERIAL: 4  
 REF NUMBER: A9  
 ORIG REF: 1ORS 1/24C4  
 REF TITLE: THE EFFECTIVENESS OF ARTILLERY IN ITALY, 1944  
 DATA SOURCE: ACTION REPORT

----- SERIAL DATA -----

SIDE 1 COUNTRY: ??  
 SIDE 1 UNITS: 1 TROOP, 2 FD BATT  
 SIDE 1 POSTURE: ATTACKING  
 SIDE 2 COUNTRY: GERMANY  
 SIDE 2 UNITS: ??  
 SIDE 2 POSTURE: DEFENDING

DATE OF ACTION: 09/26/44  
 COUNTRY: ITALY  
 REGION: MARRADI  
 TERRAIN: MOUNTAINOUS  
 WEATHER: ??  
 TIME: ??

SERIAL TACTICS: ARTILLERY BOMBARDMENT FOLLOWED BY INFANTRY ATTACK WHICH NEVER TOOK PLACE

NO. BMBRD TARGETS: 3  
 NO. PHASES/TGT: 1/1/1

----- TARGET DATA -----

BOMBARD TARGET: PHASE LEVEL

BOMBARD TGT AREA: PHASE LEVEL  
 BOMBARD TACTICS: TARGET LEVEL

----- FIRING DATA -----

FIRE UNIT: PHASE LEVEL  
 TYPE WEAPONS: PHASE LEVEL  
 NUMBER TUBES: PHASE LEVEL  
 TYPE AMMO: PHASE LEVEL  
 ROUNDS PER GUN: PHASE LEVEL  
 NUMBER ROUNDS: PHASE LEVEL  
 FIRE DURATION: TARGET LEVEL AND PHASE LEVEL

----- RESULTS DATA -----

ATTACK DELAY TIME: INFANTRY ATTACK NEVER TOOK PLACE  
 TIME TO OBJECTIVE: INFANTRY ATTACK NEVER TOOK PLACE  
 CASUALTIES: UNKNOWN (GERMAN); UNKNOWN (??)  
 EQUIPMENT DAMAGE: ??; ??  
 OTHER FACTORS: NONE

OTHER RESULTS: ??  
 SUPPRESSION: INFANTRY ATTACK NEVER TOOK PLACE

----- CALCULATED DATA -----

RDS/SQ YD: PHASE LEVEL  
 RDS/SQ YD/MIN: PHASE LEVEL  
 LBS/SQ YD: PHASE LEVEL  
 LBS/SQ YD/MIN: PHASE LEVEL  
 LBS/SQ YD (EQ): PHASE LEVEL  
 LBS/SQ YD/MIN (EQ): PHASE LEVEL

## TARGET

```

SERIAL: 4
TARGET NUMBER: 1
NUMBER PHASES: 1
TIME: 1330
----- TARGET DATA -----
TARGET: PHASE LEVEL

TARGET AREA: PHASE LEVEL
TARGET TACTICS: BOMBARD SUSPECTED GERMAN MG POST AND NEARBY TRACK

----- FIRING DATA -----
FIRE UNIT: PHASE LEVEL
TYPE WEAPONS: PHASE LEVEL
NUMBER TUBES: PHASE LEVEL
TYPE AMMO: PHASE LEVEL
ROUNDS PER GUN: PHASE LEVEL
NUMBER ROUNDS: PHASE LEVEL
FIRE DURATION: 10

----- RESULTS DATA -----
ATTACK DELAY TIME: SERIAL LEVEL
TIME TO OBJECTIVE: SERIAL LEVEL
CASUALTIES: SERIAL LEVEL
EQUIPMENT DAMAGE: SERIAL LEVEL
OTHER FACTORS: SERIAL LEVEL

OTHER RESULTS: SERIAL LEVEL
SUPPRESSION: SERIAL LEVEL

----- CALCULATED DATA -----
RDS/SQ YD: PHASE LEVEL
RDS/SQ YD/MIN: PHASE LEVEL
LBS/SQ YD: PHASE LEVEL
LBS/SQ YD/MIN: PHASE LEVEL
LBS/SQ YD (EQ): PHASE LEVEL
LBS/SQ YD/MIN (EQ): PHASE LEVEL
  
```

## PHASE

```

SERIAL: 4
TARGET NUMBER: 1
PHASE NUMBER: 1
TIME: 1330
----- TARGET DATA -----
TARGET: SUSPECTED GERMAN MG POST AND NEARBY TRACK

TARGET AREA: 2000
PHASE TACTICS: ??

----- FIRING DATA -----
FIRE UNIT: 1 TROOP OF 4X3.7 IN. MOUNTAIN HOWITZERS
TYPE WEAPONS: C
NUMBER TUBES: 4C
TYPE AMMO: HE119 C
ROUNDS PER GUN: 30C
NUMBER ROUNDS: 120C
FIRE DURATION: 10

----- RESULTS DATA -----
ATTACK DELAY TIME: SERIAL LEVEL
TIME TO OBJECTIVE: SERIAL LEVEL
CASUALTIES: SERIAL LEVEL
EQUIPMENT DAMAGE: SERIAL LEVEL
OTHER FACTORS: SERIAL LEVEL

OTHER RESULTS: SERIAL LEVEL
SUPPRESSION: SERIAL LEVEL

----- CALCULATED DATA -----
RDS/SQ YD: ??C
RDS/SQ YD/MIN: ??C
LBS/SQ YD: ??C
LBS/SQ YD/MIN: ??C
LBS/SQ YD (EQ): ??C
LBS/SQ YD/MIN (EQ): ??C
  
```

## TARGET

SERIAL: 4  
TARGET NUMBER: 2  
NUMBER PHASES: 1  
TIME: ??

----- TARGET DATA -----  
TARGET: PHASE LEVEL

TARGET AREA: PHASE LEVEL  
TARGET TACTICS: BOMBARD SUSPECTED GERMAN MG POST

----- FIRING DATA -----  
FIRE UNIT: PHASE LEVEL  
TYPE WEAPONS: PHASE LEVEL  
NUMBER TUBES: PHASE LEVEL  
TYPE AMMO: PHASE LEVEL  
ROUNDS PER GUN: PHASE LEVEL  
NUMBER ROUNDS: PHASE LEVEL  
FIRE DURATION: ??

----- RESULTS DATA -----  
ATTACK DELAY TIME: SERIAL LEVEL  
TIME TO OBJECTIVE: SERIAL LEVEL  
CASUALTIES: SERIAL LEVEL  
EQUIPMENT DAMAGE: SERIAL LEVEL  
OTHER FACTORS: SERIAL LEVEL

OTHER RESULTS: SERIAL LEVEL  
SUPPRESSION: SERIAL LEVEL

----- CALCULATED DATA -----  
RDS/SQ YD: PHASE LEVEL  
RDS/SQ YD/MIN: PHASE LEVEL  
LBS/SQ YD: PHASE LEVEL  
LBS/SQ YD/MIN: PHASE LEVEL  
LBS/SQ YD (EQ): PHASE LEVEL  
LBS/SQ YD/MIN (EQ): PHASE LEVEL

## PHASE

SERIAL: 4  
TARGET NUMBER: 2  
PHASE NUMBER: 1  
TIME: ??

----- TARGET DATA -----  
TARGET: SUSPECTED GERMAN MG POST

TARGET AREA: 10000  
PHASE TACTICS: ??

----- FIRING DATA -----  
FIRE UNIT: ??  
TYPE WEAPONS: X  
NUMBER TUBES: 6X  
TYPE AMMO: HE119 X  
ROUNDS PER GUN: 90X  
NUMBER ROUNDS: 540X  
FIRE DURATION: ??

----- RESULTS DATA -----  
ATTACK DELAY TIME: SERIAL LEVEL  
TIME TO OBJECTIVE: SERIAL LEVEL  
CASUALTIES: SERIAL LEVEL  
EQUIPMENT DAMAGE: SERIAL LEVEL  
OTHER FACTORS: SERIAL LEVEL

OTHER RESULTS: SERIAL LEVEL  
SUPPRESSION: SERIAL LEVEL

----- CALCULATED DATA -----  
RDS/SQ YD: ???  
RDS/SQ YD/MIN: ???  
LBS/SQ YD: ???  
LBS/SQ YD/MIN: ???  
LBS/SQ YD (EQ): ???  
LBS/SQ YD/MIN (EQ): ???

## TARGET

SERIAL:	4
TARGET NUMBER:	3
NUMBER PHASES:	1
TIME:	??
----- TARGET DATA -----	
TARGET:	PHASE LEVEL
TARGET AREA:	PHASE LEVEL
TARGET TACTICS:	BOMBARD SUSPECTED GERMAN MG POST AND 2 FARMHOUSES
----- FIRING DATA -----	
FIRE UNIT:	PHASE LEVEL
TYPE WEAPONS:	PHASE LEVEL
NUMBER TUBES:	PHASE LEVEL
TYPE AMMO:	PHASE LEVEL
ROUNDS PER GUN:	PHASE LEVEL
NUMBER ROUNDS:	PHASE LEVEL
FIRE DURATION:	90
----- RESULTS DATA -----	
ATTACK DELAY TIME:	SERIAL LEVEL
TIME TO OBJECTIVE:	SERIAL LEVEL
CASUALTIES:	SERIAL LEVEL
EQUIPMENT DAMAGE:	SERIAL LEVEL
OTHER FACTORS:	SERIAL LEVEL
OTHER RESULTS:	SERIAL LEVEL
SUPPRESSION:	SERIAL LEVEL
----- CALCULATED DATA -----	
RDS/SQ YD:	PHASE LEVEL
RDS/SQ YD/MIN:	PHASE LEVEL
LBS/SQ YD:	PHASE LEVEL
LBS/SQ YD/MIN:	PHASE LEVEL
LBS/SQ YD (EQ):	PHASE LEVEL
LBS/SQ YD/MIN (EQ):	PHASE LEVEL

## PHASE

SERIAL:	4
TARGET NUMBER:	3
PHASE NUMBER:	1
TIME:	??
----- TARGET DATA -----	
TARGET:	SUSPECTED GERMAN MG POST AND 2 FARMHOUSES
TARGET AREA:	15000
PHASE TACTICS:	??
----- FIRING DATA -----	
FIRE UNIT:	2 FD BATT OF 18X25 PDRS
TYPE WEAPONS:	A
NUMBER TUBES:	16A
TYPE AMMO:	HE119 A
ROUNDS PER GUN:	105A
NUMBER ROUNDS:	1680A
FIRE DURATION:	90
----- RESULTS DATA -----	
ATTACK DELAY TIME:	SERIAL LEVEL
TIME TO OBJECTIVE:	SERIAL LEVEL
CASUALTIES:	SERIAL LEVEL
EQUIPMENT DAMAGE:	SERIAL LEVEL
OTHER FACTORS:	SERIAL LEVEL
OTHER RESULTS:	SERIAL LEVEL
SUPPRESSION:	SERIAL LEVEL
----- CALCULATED DATA -----	
RDS/SQ YD:	??A
RDS/SQ YD/MIN:	??A
LBS/SQ YD:	??A
LBS/SQ YD/MIN:	??A
LBS/SQ YD (EQ):	??A
LBS/SQ YD/MIN (EQ):	??A

## SERIAL

SERIAL: 5  
 REF NUMBER: A9  
 ORIG REF: IORS 1/24CS  
 REF TITLE: THE EFFECTIVENESS OF ARTILLERY IN ITALY, 1944  
 DATA SOURCE: REPORT BY CB STAFF

----- SERIAL DATA -----

SIDE 1 COUNTRY: BRITAIN  
 SIDE 1 UNITS: ??  
 SIDE 1 POSTURE: ATTACKING  
 SIDE 2 COUNTRY: GERMANY  
 SIDE 2 UNITS: ??  
 SIDE 2 POSTURE: DEFENDING

DATE OF ACTION: 09/21/44  
 COUNTRY: ITALY  
 REGION: CASAGI TA  
 TERRAIN: FLAT GROUND  
 WEATHER: ??  
 TIME: ??

SERIAL TACTICS: NEUTRALIZE 3 GERMAN GUNS THROUGH COUNTER-BOMBARDMENT

NO. BMBRD TARGETS: 1  
 NO. PHASES/TGT: 1

----- TARGET DATA -----

BOMBARD TARGET: PHASE LEVEL  
 BOMBARD TGT AREA: PHASE LEVEL  
 BOMBARD TACTICS: TARGET LEVEL

----- FIRING DATA -----

FIRE UNIT: PHASE LEVEL  
 TYPE WEAPONS: PHASE LEVEL  
 NUMBER TUBES: PHASE LEVEL  
 TYPE AMMO: PHASE LEVEL  
 ROUNDS PER GUN: PHASE LEVEL  
 NUMBER ROUNDS: PHASE LEVEL  
 FIRE DURATION: TARGET LEVEL AND PHASE LEVEL

----- RESULTS DATA -----

ATTACK DELAY TIME: N/A  
 TIME TO OBJECTIVE: N/A  
 CASUALTIES: ?? (GERMAN); ?? (BRITISH)  
 EQUIPMENT DAMAGE: ??; ??  
 OTHER FACTORS: NONE

OTHER RESULTS: ??  
 SUPPRESSION: GERMAN GUNS DID NOT FIRE AGAIN; GERMANS LEFT EMPLACEMENT

----- CALCULATED DATA -----

RDS/SQ YD: PHASE LEVEL  
 RDS/SQ YD/MIN: PHASE LEVEL  
 LBS/SQ YD: PHASE LEVEL  
 LBS/SQ YD/MIN: PHASE LEVEL  
 LBS/SQ YD (EQ): PHASE LEVEL  
 LBS/SQ YD/MIN (EQ): PHASE LEVEL

## TARGET

SERIAL:	5
TARGET NUMBER:	1
NUMBER PHASES:	1
TIME:	??
----- TARGET DATA -----	
TARGET:	PHASE LEVEL
TARGET AREA:	PHASE LEVEL
TARGET TACTICS:	BOMBARD 3 GERMAN GUNS
----- FIRING DATA -----	
FIRE UNIT:	PHASE LEVEL
TYPE WEAPONS:	PHASE LEVEL
NUMBER TUBES:	PHASE LEVEL
TYPE AMMO:	PHASE LEVEL
ROUNDS PER GUN:	PHASE LEVEL
NUMBER ROUNDS:	PHASE LEVEL
FIRE DURATION:	??
----- RESULTS DATA -----	
ATTACK DELAY TIME:	SERIAL LEVEL
TIME TO OBJECTIVE:	SERIAL LEVEL
CASUALTIES:	SERIAL LEVEL
EQUIPMENT DAMAGE:	SERIAL LEVEL
OTHER FACTORS:	SERIAL LEVEL
OTHER RESULTS:	SERIAL LEVEL
SUPPRESSION:	SERIAL LEVEL
----- CALCULATED DATA -----	
RDS/SQ YD:	PHASE LEVEL
RDS/SQ YD/MIN:	PHASE LEVEL
LBS/SQ YD:	PHASE LEVEL
LBS/SQ YD/MIN:	PHASE LEVEL
LBS/SQ YD (EQ):	PHASE LEVEL
LBS/SQ YD/MIN (EQ):	PHASE LEVEL

## PHASE

SERIAL:	5
TARGET NUMBER:	1
PHASE NUMBER:	1
TIME:	??
----- TARGET DATA -----	
TARGET:	3 GERMAN GUNS
TARGET AREA:	10500
PHASE TACTICS:	CONCENTRATION
----- FIRING DATA -----	
FIRE UNIT:	??
TYPE WEAPONS:	F,M
NUMBER TUBES:	16F,4M
TYPE AMMO:	HE119 F,HE119 M
ROUNDS PER GUN:	2F,2M
NUMBER ROUNDS:	32F,8M
FIRE DURATION:	??
----- RESULTS DATA -----	
ATTACK DELAY TIME:	SERIAL LEVEL
TIME TO OBJECTIVE:	SERIAL LEVEL
CASUALTIES:	SERIAL LEVEL
EQUIPMENT DAMAGE:	SERIAL LEVEL
OTHER FACTORS:	SERIAL LEVEL
OTHER RESULTS:	SERIAL LEVEL
SUPPRESSION:	SERIAL LEVEL
----- CALCULATED DATA -----	
RDS/SQ YD:	0.00305F,0.000782M
RDS/SQ YD/MIN:	??F,??M
LBS/SQ YD:	0.244F,0.154M
LBS/SQ YD/MIN:	??F,??M
LBS/SQ YD (EQ):	0.202F,0.0748M
LBS/SQ YD/MIN (EQ):	??F,??M

## SERIAL

SERIAL: 6  
REF NUMBER: A9  
ORIG REF: 10RS 1/2406  
REF TITLE: THE EFFECTIVENESS OF ARTILLERY IN ITALY, 1944  
DATA SOURCE: BRITISH ACTION REPORT

----- SERIAL DATA -----  
SIDE 1 COUNTRY: BRITAIN  
SIDE 1 UNITS: 1 FD BATT  
SIDE 1 POSTURE: DEFENDING  
SIDE 2 COUNTRY: GERMANY  
SIDE 2 UNITS: ??  
SIDE 2 POSTURE: ATTACKING

DATE OF ACTION: 09/27/44  
COUNTRY: ITALY  
REGION: MARRADI  
TERRAIN: MOUNTAINOUS  
WEATHER: ??  
TIME: 1500

SERIAL TACTICS: COUNTER BATTERY OPERATION AGAINST BRITISH BATTERY

NO. BMBRD TARGETS: 1  
NO. PHASES/TGT: 1

----- TARGET DATA -----  
BOMBARD TARGET: PHASE LEVEL

BOMBARD TGT AREA: PHASE LEVEL  
BOMBARD TACTICS: TARGET LEVEL

----- FIRING DATA -----  
FIRE UNIT: PHASE LEVEL  
TYPE WEAPONS: PHASE LEVEL  
NUMBER TUBES: PHASE LEVEL  
TYPE AMMO: PHASE LEVEL  
ROUNDS PER GUN: PHASE LEVEL  
NUMBER ROUNDS: PHASE LEVEL  
FIRE DURATION: TARGET LEVEL AND PHASE LEVEL

----- RESULTS DATA -----  
ATTACK DELAY TIME: ??  
TIME TO OBJECTIVE: ??  
CASUALTIES: ?? (GERMAN); ?? (BRITISH)  
EQUIPMENT DAMAGE: ?? (GERMAN); CHD POST, 5 VEH HIT, 3/4 TIRES (BRITISH)  
OTHER FACTORS: NONE

OTHER RESULTS: OUT OF 150-200 ROUNDS FIRED, ONLY 30 LANDED IN THE POSITION  
SUPPRESSION: NO NEUTRALIZATION

----- CALCULATED DATA -----  
RDS/SQ YD: PHASE LEVEL  
RDS/SQ YD/MIN: PHASE LEVEL  
LBS/SQ YD: PHASE LEVEL  
LBS/SQ YD/MIN: PHASE LEVEL  
LBS/SQ YD (EQ): PHASE LEVEL  
LBS/SQ YD/MIN (EQ): PHASE LEVEL

## TARGET

SERIAL:	6
TARGET NUMBER:	1
NUMBER PHASES:	1
TIME:	1500
----- TARGET DATA -----	
TARGET:	PHASE LEVEL
TARGET AREA:	PHASE LEVEL
TARGET TACTICS:	COUNTER-BOMBARD BRITISH BATTERY
----- FIRING DATA -----	
FIRE UNIT:	PHASE LEVEL
TYPE WEAPONS:	PHASE LEVEL
NUMBER TUBES:	PHASE LEVEL
TYPE AMMO:	PHASE LEVEL
ROUNDS PER GUN:	PHASE LEVEL
NUMBER ROUNDS:	PHASE LEVEL
FIRE DURATION:	180
----- RESULTS DATA -----	
ATTACK DELAY TIME:	SERIAL LEVEL
TIME TO OBJECTIVE:	SERIAL LEVEL
CASUALTIES:	SERIAL LEVEL
EQUIPMENT DAMAGE:	SERIAL LEVEL
OTHER FACTORS:	SERIAL LEVEL
OTHER RESULTS:	SERIAL LEVEL
SUPPRESSION:	SERIAL LEVEL
----- CALCULATED DATA -----	
RDS/SQ YD:	PHASE LEVEL
RDS/SQ YD/MIN:	PHASE LEVEL
LBS/SQ YD:	PHASE LEVEL
LBS/SQ YD/MIN:	PHASE LEVEL
LBS/SQ YD (EQ):	PHASE LEVEL
LBS/SQ YD/MIN (EQ):	PHASE LEVEL

## PHASE

SERIAL:	6
TARGET NUMBER:	1
PHASE NUMBER:	1
TIME:	1500
----- TARGET DATA -----	
TARGET:	FO BATT - GUN PITS, 6 TRUCKS, 8 LIMBERS
TARGET AREA:	11000
PHASE TACTICS:	CONCENTRATION
----- FIRING DATA -----	
FIRE UNIT:	??
TYPE WEAPONS:	J,K
NUMBER TUBES:	6J,1K
TYPE AMMO:	??J,??K
ROUNDS PER GUN:	??J,??K
NUMBER ROUNDS:	30 J,150-200 TOTAL
FIRE DURATION:	180
----- RESULTS DATA -----	
ATTACK DELAY TIME:	SERIAL LEVEL
TIME TO OBJECTIVE:	SERIAL LEVEL
CASUALTIES:	SERIAL LEVEL
EQUIPMENT DAMAGE:	SERIAL LEVEL
OTHER FACTORS:	SERIAL LEVEL
OTHER RESULTS:	SERIAL LEVEL
SUPPRESSION:	SERIAL LEVEL
----- CALCULATED DATA -----	
RDS/SQ YD:	0.00273J,??K
RDS/SQ YD/MIN:	??J,??K
LBS/SQ YD:	0.0902J,??K
LBS/SQ YD/MIN:	??J,??K
LBS/SQ YD (EQ):	0.0879J,??K
LBS/SQ YD/MIN (EQ):	??J,??K

## SERIAL

SERIAL: 7  
REF NUMBER: A9  
ORIG REF: IORS 1/24C7  
REF TITLE: THE EFFECTIVENESS OF ARTILLERY IN ITALY, 1944  
DATA SOURCE: ??

----- SERIAL DATA -----  
SIDE 1 COUNTRY: BRITAIN  
SIDE 1 UNITS: 1 FD REGT, 2 INF PLT  
SIDE 1 POSTURE: ATTACKING  
SIDE 2 COUNTRY: GERMANY  
SIDE 2 UNITS: ??  
SIDE 2 POSTURE: DEFENDING

DATE OF ACTION: 09/25/44  
COUNTRY: ITALY  
REGION: S MARTINO IN GATTARA  
TERRAIN: MOUNTAINOUS  
WEATHER: ??  
TIME: 1400

SERIAL TACTICS: ATTACK MG POST 10 MINUTES AFTER ARTILLERY BOMBARDMENT

NO. BMBRD TARGETS: 1  
NO. PHASES/TGT: 2

----- TARGET DATA -----  
BOMBARD TARGET: TARGET LEVEL  
BOMBARD TGT AREA: TARGET LEVEL  
BOMBARD TACTICS: TARGET LEVEL

----- FIRING DATA -----  
FIRE UNIT: PHASE LEVEL  
TYPE WEAPONS: PHASE LEVEL  
NUMBER TUBES: PHASE LEVEL  
TYPE AMMO: PHASE LEVEL  
ROUNDS PER GUN: PHASE LEVEL  
NUMBER ROUNDS: PHASE LEVEL  
FIRE DURATION: TARGET LEVEL AND PHASE LEVEL

----- RESULTS DATA -----  
ATTACK DELAY TIME: 10 MINUTES  
TIME TO OBJECTIVE: ??  
CASUALTIES: UNKNOWN (GERMAN); 2 KIA, 13 WIA (BRITISH)  
EQUIPMENT DAMAGE: ??; ??  
OTHER FACTORS: NONE

OTHER RESULTS: BRITISH ATTACK ABANDONED DUE TO GERMAN MORTAR FIRE  
SUPPRESSION: GERMANS EVACUATED; BRITISH FIRE WAS PROBABLY THE CAUSE

----- CALCULATED DATA -----  
RDS/SQ YD: TARGET LEVEL  
RDS/SQ YD/MIN: TARGET LEVEL  
LBS/SQ YD: TARGET LEVEL  
LBS/SQ YD/MIN: TARGET LEVEL  
LBS/SQ YD (EQ): TARGET LEVEL  
LBS/SQ YD/MIN (EQ): TARGET LEVEL

## TARGET

SERIAL:	7
TARGET NUMBER:	1
NUMBER PHASES:	2
TIME:	1400
----- TARGET DATA -----	
TARGET:	MG POST ON WOODED HILL TOP
TARGET AREA:	360000
TARGET TACTICS:	BOMBARD MG POST ON WOODED HILL TOP
----- FIRING DATA -----	
FIRE UNIT:	PHASE LEVEL
TYPE WEAPONS:	PHASE LEVEL
NUMBER TUBES:	PHASE LEVEL
TYPE AMMO:	PHASE LEVEL
ROUNDS PER GUN:	PHASE LEVEL
NUMBER ROUNDS:	PHASE LEVEL
FIRE DURATION:	30
----- RESULTS DATA -----	
ATTACK DELAY TIME:	SERIAL LEVEL
TIME TO OBJECTIVE:	SERIAL LEVEL
CASUALTIES:	SERIAL LEVEL
EQUIPMENT DAMAGE:	SERIAL LEVEL
OTHER FACTORS:	SERIAL LEVEL
OTHER RESULTS:	SERIAL LEVEL
SUPPRESSION:	SERIAL LEVEL
----- CALCULATED DATA -----	
RDS/SQ YD:	0.003A
RDS/SQ YD/MIN:	??A
LBS/SQ YD:	0.075A
LBS/SQ YD/MIN:	??A
LBS/SQ YD (EQ):	0.075A
LBS/SQ YD/MIN (EQ):	??A

## PHASE

SERIAL:	7
TARGET NUMBER:	1
PHASE NUMBER:	1
TIME:	1400
----- TARGET DATA -----	
TARGET:	TARGET LEVEL
TARGET AREA:	TARGET LEVEL
PHASE TACTICS:	??
----- FIRING DATA -----	
FIRE UNIT:	1 FO REGT
TYPE WEAPONS:	A
NUMBER TUBES:	24A
TYPE AMMO:	HE119 A
ROUNDS PER GUN:	15A
NUMBER ROUNDS:	360A
FIRE DURATION:	15
----- RESULTS DATA -----	
ATTACK DELAY TIME:	SERIAL LEVEL
TIME TO OBJECTIVE:	SERIAL LEVEL
CASUALTIES:	SERIAL LEVEL
EQUIPMENT DAMAGE:	SERIAL LEVEL
OTHER FACTORS:	SERIAL LEVEL
OTHER RESULTS:	SERIAL LEVEL
SUPPRESSION:	SERIAL LEVEL
----- CALCULATED DATA -----	
RDS/SQ YD:	TARGET LEVEL
RDS/SQ YD/MIN:	TARGET LEVEL
LBS/SQ YD:	TARGET LEVEL
LBS/SQ YD/MIN:	TARGET LEVEL
LBS/SQ YD (EQ):	TARGET LEVEL
LBS/SQ YD/MIN (EQ):	TARGET LEVEL

PHASE

SERIAL:	7
TARGET NUMBER:	1
PHASE NUMBER:	2
TIME:	1415
----- TARGET DATA -----	
TARGET:	TARGET LEVEL
TARGET AREA:	TARGET LEVEL
PHASE TACTICS:	??
----- FIRING DATA -----	
FIRE UNIT:	1 FD REGT
TYPE WEAPONS:	A
NUMBER TUBES:	24A
TYPE AMMO:	HE119 A
ROUNDS PER GUN:	30A
NUMBER ROUNDS:	720A
FIRE DURATION:	15
----- RESULTS DATA -----	
ATTACK DELAY TIME:	SERIAL LEVEL
TIME TO OBJECTIVE:	SERIAL LEVEL
CASUALTIES:	SERIAL LEVEL
EQUIPMENT DAMAGE:	SERIAL LEVEL
OTHER FACTORS:	SERIAL LEVEL
OTHER RESULTS:	SERIAL LEVEL
SUPPRESSION:	SERIAL LEVEL
----- CALCULATED DATA -----	
RDS/SQ YD:	TARGET LEVEL
RDS/SQ YD/MIN:	TARGET LEVEL
LBS/SQ YD:	TARGET LEVEL
LBS/SQ YD/MIN:	TARGET LEVEL
LBS/SQ YD (EQ):	TARGET LEVEL
LBS/SQ YD/MIN (EQ):	TARGET LEVEL



## SERIAL

SERIAL: 8  
 REF NUMBER: A9  
 ORIG REF: 1ORS 1/24C8  
 REF TITLE: THE EFFECTIVENESS OF ARTILLERY IN ITALY, 1944  
 DATA SOURCE: ACTION REPORT PLUS GROUND RECCE

----- SERIAL DATA -----

SIDE 1 COUNTRY: BRITAIN  
 SIDE 1 UNITS: 1 HY BATT, 2 MD BATT  
 SIDE 1 POSTURE: ATTACKING  
 SIDE 2 COUNTRY: GERMANY  
 SIDE 2 UNITS: ??  
 SIDE 2 POSTURE: DEFENDING

DATE OF ACTION: 09/16/44 - 09/17/44  
 COUNTRY: ITALY  
 REGION: CASAGLIA  
 TERRAIN: MOUNTAINOUS  
 WEATHER: ??  
 TIME: 1910/1745

SERIAL TACTICS: NEUTRALIZE TARGET FOR INFANTRY

NO. BMBRD TARGETS: 2  
 NO. PHASES/TGT: 1/2

----- TARGET DATA -----

BOMBARD TARGET: PHASE LEVEL/TARGET LEVEL  
 BOMBARD TGT AREA: PHASE LEVEL/TARGET LEVEL  
 BOMBARD TACTICS: TARGET LEVEL

----- FIRING DATA -----

FIRE UNIT: PHASE LEVEL  
 TYPE WEAPONS: PHASE LEVEL  
 NUMBER TUBES: PHASE LEVEL  
 TYPE AMMO: PHASE LEVEL  
 ROUNDS PER GUN: PHASE LEVEL  
 NUMBER ROUNDS: PHASE LEVEL  
 FIRE DURATION: TARGET LEVEL AND PHASE LEVEL

----- RESULTS DATA -----

ATTACK DELAY TIME: ??  
 TIME TO OBJECTIVE: ??  
 CASUALTIES: ?? (GERMAN); ?? (BRITISH)  
 EQUIPMENT DAMAGE: 1 PIT DES, 1 DAM, ACCM HUTS DES (GERMAN); ?? (BRITISH)  
 OTHER FACTORS: NONE

OTHER RESULTS: ??  
 SUPPRESSION: POSITION WAS FOUND TO BE ABANDONED

----- CALCULATED DATA -----

RDS/SQ YD: PHASE LEVEL  
 RDS/SQ YD/MIN: PHASE LEVEL  
 LBS/SQ YD: PHASE LEVEL  
 LBS/SQ YD/MIN: PHASE LEVEL  
 LBS/SQ YD (EQ): PHASE LEVEL  
 LBS/SQ YD/MIN (EQ): PHASE LEVEL

## TARGET

SERIAL:	8
TARGET NUMBER:	1
NUMBER PHASES:	1
TIME:	1910
----- TARGET DATA -----	
TARGET:	PHASE LEVEL
TARGET AREA:	PHASE LEVEL
TARGET TACTICS:	BOMBARD WEAPON PITS AND DEEP SHELTERS
----- FIRING DATA -----	
FIRE UNIT:	PHASE LEVEL
TYPE WEAPONS:	PHASE LEVEL
NUMBER TUBES:	PHASE LEVEL
TYPE AMMO:	PHASE LEVEL
ROUNDS PER GUN:	PHASE LEVEL
NUMBER ROUNDS:	PHASE LEVEL
FIRE DURATION:	1
----- RESULTS DATA -----	
ATTACK DELAY TIME:	SERIAL LEVEL
TIME TO OBJECTIVE:	SERIAL LEVEL
CASUALTIES:	SERIAL LEVEL
EQUIPMENT DAMAGE:	SERIAL LEVEL
OTHER FACTORS:	SERIAL LEVEL
OTHER RESULTS:	SERIAL LEVEL
SUPPRESSION:	SERIAL LEVEL
----- CALCULATED DATA -----	
RDS/SQ YD:	PHASE LEVEL
RDS/SQ YD/MIN:	PHASE LEVEL
LBS/SQ YD:	PHASE LEVEL
LBS/SQ YD/MIN:	PHASE LEVEL
LBS/SQ YD (EQ):	PHASE LEVEL
LBS/SQ YD/MIN (EQ):	PHASE LEVEL

## PHASE

SERIAL:	8
TARGET NUMBER:	1
PHASE NUMBER:	1
TIME:	1910
----- TARGET DATA -----	
TARGET:	2 WEAPON PITS WITH ADJOINING DEEP SHELTERS
TARGET AREA:	17000
PHASE TACTICS:	CONCENTRATION
----- FIRING DATA -----	
FIRE UNIT:	1 HV BATT
TYPE WEAPONS:	H
NUMBER TUBES:	8M
TYPE AMMO:	HE117 H
ROUNDS PER GUN:	??M
NUMBER ROUNDS:	10-15H
FIRE DURATION:	1
----- RESULTS DATA -----	
ATTACK DELAY TIME:	SERIAL LEVEL
TIME TO OBJECTIVE:	SERIAL LEVEL
CASUALTIES:	SERIAL LEVEL
EQUIPMENT DAMAGE:	SERIAL LEVEL
OTHER FACTORS:	SERIAL LEVEL
OTHER RESULTS:	SERIAL LEVEL
SUPPRESSION:	SERIAL LEVEL
----- CALCULATED DATA -----	
RDS/SQ YD:	0.0008-0.0009H
RDS/SQ YD/MIN:	??H
LBS/SQ YD:	0.12-0.18H
LBS/SQ YD/MIN:	??H
LBS/SQ YD (EQ):	0.06-0.09H
LBS/SQ YD/MIN (EQ):	??H

## TARGET

```

SERIAL: 8
TARGET NUMBER: 2
NUMBER PHASES: 2
TIME: 1745
----- TARGET DATA -----
TARGET: 2 WEAPON PITS WITH ADJOINING DEEP SHELTERS

TARGET AREA: 17000
TARGET TACTICS: BOMBARD WEAPON PITS AND DEEP SHELTERS

----- FIRING DATA -----
FIRE UNIT: PHASE LEVEL
TYPE WEAPONS: PHASE LEVEL
NUMBER TUBES: PHASE LEVEL
TYPE AMMO: PHASE LEVEL
ROUNDS PER GUN: PHASE LEVEL
NUMBER ROUNDS: PHASE LEVEL
FIRE DURATION: 137

----- RESULTS DATA -----
ATTACK DELAY TIME: SERIAL LEVEL
TIME TO OBJECTIVE: SERIAL LEVEL
CASUALTIES: SERIAL LEVEL
EQUIPMENT DAMAGE: SERIAL LEVEL
OTHER FACTORS: SERIAL LEVEL

OTHER RESULTS: SERIAL LEVEL
SUPPRESSION: SERIAL LEVEL

----- CALCULATED DATA -----
RDS/SQ YD: PHASE LEVEL
RDS/SQ YD/MIN: PHASE LEVEL
LBS/SQ YD: PHASE LEVEL
LBS/SQ YD/MIN: PHASE LEVEL
LBS/SQ YD (EQ): PHASE LEVEL
LBS/SQ YD/MIN (EQ): PHASE LEVEL
  
```

## PHASE

```

SERIAL: 8
TARGET NUMBER: 2
PHASE NUMBER: 1
TIME: 1745
----- TARGET DATA -----
TARGET: TARGET LEVEL

TARGET AREA: TARGET LEVEL
PHASE TACTICS: CONCENTRATION

----- FIRING DATA -----
FIRE UNIT: 2 MD BATT
TYPE WEAPONS: F
NUMBER TUBES: 16F
TYPE AMMO: HE119 F
ROUNDS PER GUN: 5F
NUMBER ROUNDS: 60F
FIRE DURATION: 2.5

----- RESULTS DATA -----
ATTACK DELAY TIME: SERIAL LEVEL
TIME TO OBJECTIVE: SERIAL LEVEL
CASUALTIES: SERIAL LEVEL
EQUIPMENT DAMAGE: SERIAL LEVEL
OTHER FACTORS: SERIAL LEVEL

OTHER RESULTS: SERIAL LEVEL
SUPPRESSION: SERIAL LEVEL

----- CALCULATED DATA -----
RDS/SQ YD: 0.0047F
RDS/SQ YD/MIN: ??F
LBS/SQ YD: 0.370F
LBS/SQ YD/MIN: ??F
LBS/SQ YD (EQ): 0.312F
LBS/SQ YD/MIN (EQ): ??F
  
```

# PHASE

SERIAL:	8
TARGET NUMBER:	2
PHASE NUMBER:	2
TIME:	2000
----- TARGET DATA -----	
TARGET:	TARGET LEVEL
TARGET AREA:	TARGET LEVEL
PHASE TACTICS:	CONCENTRATION
----- FIRING DATA -----	
FIRE UNIT:	2 MD BATT
TYPE WEAPONS:	F
NUMBER TUBES:	16F
TYPE AMMO:	ME119 F
ROUNDS PER GUN:	5F
NUMBER ROUNDS:	80F
FIRE DURATION:	2.5
----- RESULTS DATA -----	
ATTACK DELAY TIME:	SERIAL LEVEL
TIME TO OBJECTIVE:	SERIAL LEVEL
CASUALTIES:	SERIAL LEVEL
EQUIPMENT DAMAGE:	SERIAL LEVEL
OTHER FACTORS:	SERIAL LEVEL
OTHER RESULTS:	SERIAL LEVEL
SUPPRESSION:	SERIAL LEVEL
----- CALCULATED DATA -----	
RDS/SQ YD:	0.0047F
RDS/SQ YD/MIN:	??F
LBS/SQ YD:	0.376F
LBS/SQ YD/MIN:	??F
LBS/SQ YD (EQ):	0.312F
LBS/SQ YD/MIN (EQ):	??F

SERIAL

SERIAL: 9  
 REF NUMBER: A9  
 ORIG REF: 1ORS 1/24C9  
 REF TITLE: THE EFFECTIVENESS OF ARTILLERY IN ITALY, 1944  
 DATA SOURCE: ACTION REPORT PLUS GROUND RECCE

----- SERIAL DATA -----

SIDE 1 COUNTRY: BRITAIN  
 SIDE 1 UNITS: 4 BATT  
 SIDE 1 POSTURE: ATTACKING  
 SIDE 2 COUNTRY: GERMANY  
 SIDE 2 UNITS: ??  
 SIDE 2 POSTURE: DEFENDING

DATE OF ACTION: 10/02/44  
 COUNTRY: ITALY  
 REGION: S MARTINO IN GATTARA  
 TERRAIN: MOUNTAINOUS  
 WEATHER: ??  
 TIME: 1200

SERIAL TACTICS: BRITISH INFANTRY WERE TO ATTACK TWO MAIN TARGETS. FOUR OTHER POSITIONS WERE TO BE SUPPRESSED

NO. BMBRD TARGETS: 6  
 NO. PHASES/TGT: 3/3/1/1/1/1

----- TARGET DATA -----

BOMBARD TARGET: TARGET/TARGET/PHASE/PHASE/PHASE/PHASE  
 BOMBARD TGT AREA: TARGET/TARGET/PHASE/PHASE/PHASE/PHASE  
 BOMBARD TACTICS: TARGET LEVEL

----- FIRING DATA -----

FIRE UNIT: PHASE LEVEL  
 TYPE WEAPONS: PHASE LEVEL  
 NUMBER TUBES: PHASE LEVEL  
 TYPE AMMO: PHASE LEVEL  
 ROUNDS PER GUN: PHASE LEVEL  
 NUMBER ROUNDS: PHASE LEVEL  
 FIRE DURATION: TARGET LEVEL AND PHASE LEVEL

----- RESULTS DATA -----

ATTACK DELAY TIME: ??  
 TIME TO OBJECTIVE: 10 MINUTES  
 CASUALTIES: 6 KIA (GERMAN);?? (BRITISH)  
 EQUIPMENT DAMAGE: NONE (GERMAN);?? (BRITISH)  
 OTHER FACTORS: NONE

OTHER RESULTS: NO CRATERS WERE FOUND ON MAIN TARGETS  
 SUPPRESSION: FIRE MAY HAVE DRIVEN GERMANS OFF, OR POSITIONS MAY HAVE BEEN EMPTY

----- CALCULATED DATA -----

RDS/SQ YD: TARGET/TARGET/PHASE/PHASE/PHASE/PHASE  
 RDS/SQ YD/MIN: TARGET/TARGET/PHASE/PHASE/PHASE/PHASE  
 LBS/SQ YD: TARGET/TARGET/PHASE/PHASE/PHASE/PHASE  
 LBS/SQ YD/MIN: TARGET/TARGET/PHASE/PHASE/PHASE/PHASE  
 LBS/SQ YD (EQ): TARGET/TARGET/PHASE/PHASE/PHASE/PHASE  
 LBS/SQ YD/MIN (EQ): TARGET/TARGET/PHASE/PHASE/PHASE/PHASE

## TARGET

SERIAL:	9
TARGET NUMBER:	1
NUMBER PHASES:	3
TIME:	1200
----- TARGET DATA -----	
TARGET:	GERMAN MG POSITION ON HILL TOP
TARGET AREA:	6200
TARGET TACTICS:	BOMBARD MG POSITION
----- FIRING DATA -----	
FIRE UNIT:	PHASE LEVEL
TYPE WEAPONS:	PHASE LEVEL
NUMBER TUBES:	PHASE LEVEL
TYPE AMMO:	PHASE LEVEL
ROUNDS PER GUN:	PHASE LEVEL
NUMBER ROUNDS:	PHASE LEVEL
FIRE DURATION:	288
----- RESULTS DATA -----	
ATTACK DELAY TIME:	SERIAL LEVEL
TIME TO OBJECTIVE:	SERIAL LEVEL
CASUALTIES:	SERIAL LEVEL
EQUIPMENT DAMAGE:	SERIAL LEVEL
OTHER FACTORS:	SERIAL LEVEL
OTHER RESULTS:	SERIAL LEVEL
SUPPRESSION:	SERIAL LEVEL
----- CALCULATED DATA -----	
RDS/SQ YD:	0.133A
RDS/SQ YD/MIN:	?7A
LBS/SQ YD:	3.325A
LBS/SQ YD/MIN:	?7A
LBS/SQ YD (EQ):	3.325A
LBS/SQ YD/MIN (EQ):	?7A

## PHASE

SERIAL:	9
TARGET NUMBER:	1
PHASE NUMBER:	1
TIME:	1200
----- TARGET DATA -----	
TARGET:	TARGET LEVEL
TARGET AREA:	TARGET LEVEL
PHASE TACTICS:	CONCENTRATION
----- FIRING DATA -----	
FIRE UNIT:	?7
TYPE WEAPONS:	A
NUMBER TUBES:	?7A
TYPE AMMO:	HE119 A
ROUNDS PER GUN:	?7A
NUMBER ROUNDS:	380A
FIRE DURATION:	180
----- RESULTS DATA -----	
ATTACK DELAY TIME:	SERIAL LEVEL
TIME TO OBJECTIVE:	SERIAL LEVEL
CASUALTIES:	SERIAL LEVEL
EQUIPMENT DAMAGE:	SERIAL LEVEL
OTHER FACTORS:	SERIAL LEVEL
OTHER RESULTS:	SERIAL LEVEL
SUPPRESSION:	SERIAL LEVEL
----- CALCULATED DATA -----	
RDS/SQ YD:	TARGET LEVEL
RDS/SQ YD/MIN:	TARGET LEVEL
LBS/SQ YD:	TARGET LEVEL
LBS/SQ YD/MIN:	TARGET LEVEL
LBS/SQ YD (EQ):	TARGET LEVEL
LBS/SQ YD/MIN (EQ):	TARGET LEVEL

## PHASE

```

SERIAL:          9
TARGET NUMBER:   1
PHASE NUMBER:    2
TIME:           1625
----- TARGET DATA -----
TARGET:          TARGET LEVEL

TARGET AREA:     TARGET LEVEL
PHASE TACTICS:   CONCENTRATION

----- FIRING DATA -----
FIRE UNIT:       1 BATT
TYPE WEAPONS:    A
NUMBER TUBES:    8A
TYPE AMMO:       HE119 A
ROUNDS PER GUN:  45A
NUMBER ROUNDS:   360A
FIRE DURATION:   15

----- RESULTS DATA -----
ATTACK DELAY TIME: SERIAL LEVEL
TIME TO OBJECTIVE: SERIAL LEVEL
CASUALTIES:       SERIAL LEVEL
EQUIPMENT DAMAGE: SERIAL LEVEL
OTHER FACTORS:    SERIAL LEVEL

OTHER RESULTS:   SERIAL LEVEL
SUPPRESSION:     SERIAL LEVEL

----- CALCULATED DATA -----
RDS/SQ YD:       TARGET LEVEL
RDS/SQ YD/MIN:   TARGET LEVEL
LBS/SQ YD:       TARGET LEVEL
LBS/SQ YD/MIN:   TARGET LEVEL
LBS/SQ YD (EQ): TARGET LEVEL
LBS/SQ YD/MIN (EQ): TARGET LEVEL
    
```

## PHASE

```

SERIAL:          9
TARGET NUMBER:   1
PHASE NUMBER:    3
TIME:           1640
----- TARGET DATA -----
TARGET:          TARGET LEVEL

TARGET AREA:     TARGET LEVEL
PHASE TACTICS:   CONCENTRATION

----- FIRING DATA -----
FIRE UNIT:       1 TROOP
TYPE WEAPONS:    A
NUMBER TUBES:    4A
TYPE AMMO:       HE119 A
ROUNDS PER GUN:  24A
NUMBER ROUNDS:   96A
FIRE DURATION:   8

----- RESULTS DATA -----
ATTACK DELAY TIME: SERIAL LEVEL
TIME TO OBJECTIVE: SERIAL LEVEL
CASUALTIES:       SERIAL LEVEL
EQUIPMENT DAMAGE: SERIAL LEVEL
OTHER FACTORS:    SERIAL LEVEL

OTHER RESULTS:   SERIAL LEVEL
SUPPRESSION:     SERIAL LEVEL

----- CALCULATED DATA -----
RDS/SQ YD:       TARGET LEVEL
RDS/SQ YD/MIN:   TARGET LEVEL
LBS/SQ YD:       TARGET LEVEL
LBS/SQ YD/MIN:   TARGET LEVEL
LBS/SQ YD (EQ): TARGET LEVEL
LBS/SQ YD/MIN (EQ): TARGET LEVEL
    
```

## TARGET

SERIAL:	9
TARGET NUMBER:	2
NUMBER PHASES:	3
TIME:	1200
----- TARGET DATA -----	
TARGET:	GERMAN MG POSITION ON HILL TOP
TARGET AREA:	6200
TARGET TACTICS:	BOMBARD MG POSITION
----- FIRING DATA -----	
FIRE UNIT:	PHASE LEVEL
TYPE WEAPONS:	PHASE LEVEL
NUMBER TUBES:	PHASE LEVEL
TYPE AMMO:	PHASE LEVEL
ROUNDS PER GUN:	PHASE LEVEL
NUMBER ROUNDS:	PHASE LEVEL
FIRE DURATION:	288
----- RESULTS DATA -----	
ATTACK DELAY TIME:	SERIAL LEVEL
TIME TO OBJECTIVE:	SERIAL LEVEL
CASUALTIES:	SERIAL LEVEL
EQUIPMENT DAMAGE:	SERIAL LEVEL
OTHER FACTORS:	SERIAL LEVEL
OTHER RESULTS:	SERIAL LEVEL
SUPPRESSION:	SERIAL LEVEL
----- CALCULATED DATA -----	
RDS/SQ YD:	0.133A
RDS/SQ YD/MIN:	??A
LBS/SQ YD:	3.325A
LBS/SQ YD/MIN:	??A
LBS/SQ YD (EQ):	3.325A
LBS/SQ YD/MIN (EQ):	??A

## PHASE

SERIAL:	9
TARGET NUMBER:	2
PHASE NUMBER:	1
TIME:	1200
----- TARGET DATA -----	
TARGET:	TARGET LEVEL
TARGET AREA:	TARGET LEVEL
PHASE TACTICS:	CONCENTRATION
----- FIRING DATA -----	
FIRE UNIT:	??
TYPE WEAPONS:	A
NUMBER TUBES:	??A
TYPE AMMO:	HE119 A
ROUNDS PER GUN:	??A
NUMBER ROUNDS:	380A
FIRE DURATION:	180
----- RESULTS DATA -----	
ATTACK DELAY TIME:	SERIAL LEVEL
TIME TO OBJECTIVE:	SERIAL LEVEL
CASUALTIES:	SERIAL LEVEL
EQUIPMENT DAMAGE:	SERIAL LEVEL
OTHER FACTORS:	SERIAL LEVEL
OTHER RESULTS:	SERIAL LEVEL
SUPPRESSION:	SERIAL LEVEL
----- CALCULATED DATA -----	
RDS/SQ YD:	TARGET LEVEL
RDS/SQ YD/MIN:	TARGET LEVEL
LBS/SQ YD:	TARGET LEVEL
LBS/SQ YD/MIN:	TARGET LEVEL
LBS/SQ YD (EQ):	TARGET LEVEL
LBS/SQ YD/MIN (EQ):	TARGET LEVEL

## PHASE

SERIAL:	9
TARGET NUMBER:	2
PHASE NUMBER:	2
TIME:	1625
----- TARGET DATA -----	
TARGET:	TARGET LEVEL
TARGET AREA:	TARGET LEVEL
PHASE TACTICS:	CONCENTRATION
----- FIRING DATA -----	
FIRE UNIT:	1 BATT
TYPE WEAPONS:	A
NUMBER TUBES:	8A
TYPE AMMO:	HE119 A
ROUNDS PER GUN:	45A
NUMBER ROUNDS:	360A
FIRE DURATION:	15
----- RESULTS DATA -----	
ATTACK DELAY TIME:	SERIAL LEVEL
TIME TO OBJECTIVE:	SERIAL LEVEL
CASUALTIES:	SERIAL LEVEL
EQUIPMENT DAMAGE:	SERIAL LEVEL
OTHER FACTORS:	SERIAL LEVEL
OTHER RESULTS:	SERIAL LEVEL
SUPPRESSION:	SERIAL LEVEL
----- CALCULATED DATA -----	
RDS/SQ YD:	TARGET LEVEL
RDS/SQ YD/MIN:	TARGET LEVEL
LBS/SQ YD:	TARGET LEVEL
LBS/SQ YD/MIN:	TARGET LEVEL
LBS/SQ YD (EQ):	TARGET LEVEL
LBS/SQ YD/MIN (EQ):	TARGET LEVEL

## PHASE

SERIAL:	9
TARGET NUMBER:	2
PHASE NUMBER:	3
TIME:	1640
----- TARGET DATA -----	
TARGET:	TARGET LEVEL
TARGET AREA:	TARGET LEVEL
PHASE TACTICS:	CONCENTRATION
----- FIRING DATA -----	
FIRE UNIT:	1 TROOP
TYPE WEAPONS:	A
NUMBER TUBES:	4A
TYPE AMMO:	HE119 A
ROUNDS PER GUN:	24A
NUMBER ROUNDS:	96A
FIRE DURATION:	8
----- RESULTS DATA -----	
ATTACK DELAY TIME:	SERIAL LEVEL
TIME TO OBJECTIVE:	SERIAL LEVEL
CASUALTIES:	SERIAL LEVEL
EQUIPMENT DAMAGE:	SERIAL LEVEL
OTHER FACTORS:	SERIAL LEVEL
OTHER RESULTS:	SERIAL LEVEL
SUPPRESSION:	SERIAL LEVEL
----- CALCULATED DATA -----	
RDS/SQ YD:	TARGET LEVEL
RDS/SQ YD/MIN:	TARGET LEVEL
LBS/SQ YD:	TARGET LEVEL
LBS/SQ YD/MIN:	TARGET LEVEL
LBS/SQ YD (EQ):	TARGET LEVEL
LBS/SQ YD/MIN (EQ):	TARGET LEVEL

## TARGET

SERIAL: 9  
TARGET NUMBER: 3  
NUMBER PHASES: 1  
TIME: 1625

----- TARGET DATA -----  
TARGET: PHASE LEVEL

TARGET AREA: PHASE LEVEL  
TARGET TACTICS: SUPPRESS SUSPECTED GERMAN POSITION DURING INFANTRY ATTACK

----- FIRING DATA -----  
FIRE UNIT: PHASE LEVEL  
TYPE WEAPONS: PHASE LEVEL  
NUMBER TUBES: PHASE LEVEL  
TYPE AMMO: PHASE LEVEL  
ROUNDS PER GUN: PHASE LEVEL  
NUMBER ROUNDS: PHASE LEVEL  
FIRE DURATION: 23

----- RESULTS DATA -----  
ATTACK DELAY TIME: SERIAL LEVEL  
TIME TO OBJECTIVE: SERIAL LEVEL  
CASUALTIES: SERIAL LEVEL  
EQUIPMENT DAMAGE: SERIAL LEVEL  
OTHER FACTORS: SERIAL LEVEL

OTHER RESULTS: SERIAL LEVEL  
SUPPRESSION: SERIAL LEVEL

----- CALCULATED DATA -----  
RDS/SQ YD: PHASE LEVEL  
RDS/SQ YD/MIN: PHASE LEVEL  
LBS/SQ YD: PHASE LEVEL  
LBS/SQ YD/MIN: PHASE LEVEL  
LBS/SQ YD (EQ): PHASE LEVEL  
LBS/SQ YD/MIN (EQ): PHASE LEVEL

## PHASE

SERIAL: 9  
TARGET NUMBER: 3  
PHASE NUMBER: 1  
TIME: 1625

----- TARGET DATA -----  
TARGET: SUSPECTED GERMAN POSITION ON HILL TOP

TARGET AREA: 3100  
PHASE TACTICS: CONCENTRATION

----- FIRING DATA -----  
FIRE UNIT: 1 TROOP  
TYPE WEAPONS: A  
NUMBER TUBES: 4A  
TYPE AMMO: HE119 A  
ROUNDS PER GUN: 34.75A  
NUMBER ROUNDS: 139A  
FIRE DURATION: 23

----- RESULTS DATA -----  
ATTACK DELAY TIME: SERIAL LEVEL  
TIME TO OBJECTIVE: SERIAL LEVEL  
CASUALTIES: SERIAL LEVEL  
EQUIPMENT DAMAGE: SERIAL LEVEL  
OTHER FACTORS: SERIAL LEVEL

OTHER RESULTS: SERIAL LEVEL  
SUPPRESSION: SERIAL LEVEL

----- CALCULATED DATA -----  
RDS/SQ YD: 0.0448A  
RDS/SQ YD/MIN: ??A  
LBS/SQ YD: 1.12A  
LBS/SQ YD/MIN: ??A  
LBS/SQ YD (EQ): 1.12A  
LBS/SQ YD/MIN (EQ): ??A

## TARGET

```

SERIAL:          9
TARGET NUMBER:   4
NUMBER PHASES:   1
TIME:            1625
----- TARGET DATA -----
TARGET:          PHASE LEVEL

TARGET AREA:     PHASE LEVEL
TARGET TACTICS:  SUPPRESS SUSPECTED GERMAN POSITION DURING INFANTRY ATTACK

----- FIRING DATA -----
FIRE UNIT:       PHASE LEVEL
TYPE WEAPONS:    PHASE LEVEL
NUMBER TUBES:    PHASE LEVEL
TYPE AMMO:       PHASE LEVEL
ROUNDS PER GUN:  PHASE LEVEL
NUMBER ROUNDS:   PHASE LEVEL
FIRE DURATION:   23

----- RESULTS DATA -----
ATTACK DELAY TIME: SERIAL LEVEL
TIME TO OBJECTIVE: SERIAL LEVEL
CASUALTIES:       SERIAL LEVEL
EQUIPMENT DAMAGE: SERIAL LEVEL
OTHER FACTORS:    SERIAL LEVEL

OTHER RESULTS:   SERIAL LEVEL
SUPPRESSION:     SERIAL LEVEL

----- CALCULATED DATA -----
RDS/SQ YD:       PHASE LEVEL
RDS/SQ YD/MIN:   PHASE LEVEL
LBS/SQ YD:       PHASE LEVEL
LBS/SQ YD/MIN:   PHASE LEVEL
LBS/SQ YD (EQ):  PHASE LEVEL
LBS/SQ YD/MIN (EQ): PHASE LEVEL
  
```

## PHASE

```

SERIAL:          9
TARGET NUMBER:   4
PHASE NUMBER:    1
TIME:            1625
----- TARGET DATA -----
TARGET:          SUSPECTED GERMAN POSITION ON HILL TOP

TARGET AREA:     3100
PHASE TACTICS:   CONCENTRATION

----- FIRING DATA -----
FIRE UNIT:       1 TROOP
TYPE WEAPONS:    A
NUMBER TUBES:    4A
TYPE AMMO:       HE119 A
ROUNDS PER GUN:  34.75A
NUMBER ROUNDS:   139A
FIRE DURATION:   23

----- RESULTS DATA -----
ATTACK DELAY TIME: SERIAL LEVEL
TIME TO OBJECTIVE: SERIAL LEVEL
CASUALTIES:       SERIAL LEVEL
EQUIPMENT DAMAGE: SERIAL LEVEL
OTHER FACTORS:    SERIAL LEVEL

OTHER RESULTS:   SERIAL LEVEL
SUPPRESSION:     SERIAL LEVEL

----- CALCULATED DATA -----
RDS/SQ YD:       0.0448A
RDS/SQ YD/MIN:   ??A
LBS/SQ YD:       1.12A
LBS/SQ YD/MIN:   ??A
LBS/SQ YD (EQ):  1.12A
LBS/SQ YD/MIN (EQ): ??A
  
```

## TARGET

SERIAL:	9
TARGET NUMBER:	5
NUMBER PHASES:	1
TIME:	1625
----- TARGET DATA -----	
TARGET:	PHASE LEVEL
TARGET AREA:	PHASE LEVEL
TARGET TACTICS:	SUPPRESS SUSPECTED GERMAN POSITION DURING INFANTRY ATTACK
----- FIRING DATA -----	
FIRE UNIT:	PHASE LEVEL
TYPE WEAPONS:	PHASE LEVEL
NUMBER TUBES:	PHASE LEVEL
TYPE AMMO:	PHASE LEVEL
ROUNDS PER GUN:	PHASE LEVEL
NUMBER ROUNDS:	PHASE LEVEL
FIRE DURATION:	23
----- RESULTS DATA -----	
ATTACK DELAY TIME:	SERIAL LEVEL
TIME TO OBJECTIVE:	SERIAL LEVEL
CASUALTIES:	SERIAL LEVEL
EQUIPMENT DAMAGE:	SERIAL LEVEL
OTHER FACTORS:	SERIAL LEVEL
OTHER RESULTS:	SERIAL LEVEL
SUPPRESSION:	SERIAL LEVEL
----- CALCULATED DATA -----	
RDS/SQ YD:	PHASE LEVEL
RDS/SQ YD/MIN:	PHASE LEVEL
LBS/SQ YD:	PHASE LEVEL
LBS/SQ YD/MIN:	PHASE LEVEL
LBS/SQ YD (EQ):	PHASE LEVEL
LBS/SQ YD/MIN (EQ):	PHASE LEVEL

## PHASE

SERIAL:	9
TARGET NUMBER:	5
PHASE NUMBER:	1
TIME:	1625
----- TARGET DATA -----	
TARGET:	SUSPECTED GERMAN POSITION ON HILL TOP
TARGET AREA:	3100
PHASE TACTICS:	CONCENTRATION
----- FIRING DATA -----	
FIRE UNIT:	1 TRGOP
TYPE WEAPONS:	A
NUMBER TUBES:	4A
TYPE AMMO:	HE119 A
ROUNDS PER GUN:	34.75A
NUMBER ROUNDS:	139A
FIRE DURATION:	23
----- RESULTS DATA -----	
ATTACK DELAY TIME:	SERIAL LEVEL
TIME TO OBJECTIVE:	SERIAL LEVEL
CASUALTIES:	SERIAL LEVEL
EQUIPMENT DAMAGE:	SERIAL LEVEL
OTHER FACTORS:	SERIAL LEVEL
OTHER RESULTS:	SERIAL LEVEL
SUPPRESSION:	SERIAL LEVEL
----- CALCULATED DATA -----	
RDS/SQ YD:	0.0448A
RDS/SQ YD/MIN:	??A
LBS/SQ YD:	1.12A
LBS/SQ YD/MIN:	??A
LBS/SQ YD (EQ):	1.12A
LBS/SQ YD/MIN (EQ):	??A

## TARGET

SERIAL: 9  
TARGET NUMBER: 6  
NUMBER PHASES: 1  
TIME: 1625

----- TARGET DATA -----  
TARGET: PHASE LEVEL

TARGET AREA: PHASE LEVEL  
TARGET TACTICS: SUPPRESS SUSPECTED GERMAN POSITION DURING INFANTRY ATTACK

----- FIRING DATA -----  
FIRE UNIT: PHASE LEVEL  
TYPE WEAPONS: PHASE LEVEL  
NUMBER TUBES: PHASE LEVEL  
TYPE AMMO: PHASE LEVEL  
ROUNDS PER GUN: PHASE LEVEL  
NUMBER ROUNDS: PHASE LEVEL  
FIRE DURATION: 23

----- RESULTS DATA -----  
ATTACK DELAY TIME: SERIAL LEVEL  
TIME TO OBJECTIVE: SERIAL LEVEL  
CASUALTIES: SERIAL LEVEL  
EQUIPMENT DAMAGE: SERIAL LEVEL  
OTHER FACTORS: SERIAL LEVEL

OTHER RESULTS: SERIAL LEVEL  
SUPPRESSION: SERIAL LEVEL

----- CALCULATED DATA -----  
RDS/SQ YD: PHASE LEVEL  
RDS/SQ YD/MIN: PHASE LEVEL  
LBS/SQ YD: PHASE LEVEL  
LBS/SQ YD/MIN: PHASE LEVEL  
LBS/SQ YD (EQ): PHASE LEVEL  
LBS/SQ YD/MIN (EQ): PHASE LEVEL

## PHASE

SERIAL: 9  
TARGET NUMBER: 6  
PHASE NUMBER: 1  
TIME: 1625

----- TARGET DATA -----  
TARGET: SUSPECTED GERMAN POSITION ON HILL TOP

TARGET AREA: 3100  
PHASE TACTICS: CONCENTRATION

----- FIRING DATA -----  
FIRE UNIT: 1 TROOP  
TYPE WEAPONS: A  
NUMBER TUBES: 4A  
TYPE AMMO: HE119 A  
ROUNDS PER GUN: 34.75A  
NUMBER ROUNDS: 139A  
FIRE DURATION: 23

----- RESULTS DATA -----  
ATTACK DELAY TIME: SERIAL LEVEL  
TIME TO OBJECTIVE: SERIAL LEVEL  
CASUALTIES: SERIAL LEVEL  
EQUIPMENT DAMAGE: SERIAL LEVEL  
OTHER FACTORS: SERIAL LEVEL

OTHER RESULTS: SERIAL LEVEL  
SUPPRESSION: SERIAL LEVEL

----- CALCULATED DATA -----  
RDS/SQ YD: 0.0448A  
RDS/SQ YD/MIN: ??A  
LBS/SQ YD: 1.12A  
LBS/SQ YD/MIN: ??A  
LBS/SQ YD (EQ): 1.12A  
LBS/SQ YD/MIN (EQ): ??A



SERIAL

SERIAL: 10.01  
 REF NUMBER: A9  
 ORIG REF: IORS 1/24 PART II  
 REF TITLE: THE EFFECTIVENESS OF ARTILLERY IN ITALY, 1944  
 DATA SOURCE: ACTION REPORT NUMBER 1

----- SERIAL DATA -----

SIDE 1 COUNTRY: BRITAIN  
 SIDE 1 UNITS: RHQ OF FD REGT  
 SIDE 1 POSTURE: DEFENDING  
 SIDE 2 COUNTRY: GERMANY  
 SIDE 2 UNITS: ??  
 SIDE 2 POSTURE: ATTACKING

DATE OF ACTION: 03/07/44  
 COUNTRY: ITALY  
 REGION: ANZIO BEACH-HEAD  
 TERRAIN: BEACH  
 WEATHER: ??  
 TIME: ??

SERIAL TACTICS: ARTILLERY BOMBARDMENT WITHOUT FOLLOW-ON ATTACK

NO. BMBRD TARGETS: 1  
 NO. PHASES/TGT: 2

----- TARGET DATA -----

BOMBARD TARGET: TARGET LEVEL

BOMBARD TGT AREA: TARGET LEVEL  
 BOMBARD TACTICS: TARGET LEVEL

----- FIRING DATA -----

FIRE UNIT: PHASE LEVEL  
 TYPE WEAPONS: PHASE LEVEL  
 NUMBER TUBES: PHASE LEVEL  
 TYPE AMMO: PHASE LEVEL  
 ROUNDS PER GUN: PHASE LEVEL  
 NUMBER ROUNDS: PHASE LEVEL  
 FIRE DURATION: TARGET LEVEL AND PHASE LEVEL

----- RESULTS DATA -----

ATTACK DELAY TIME: N/A  
 TIME TO OBJECTIVE: N/A  
 CASUALTIES: ?? (GERMAN); 1 KIA, 2 WIA (BRITISH)  
 EQUIPMENT DAMAGE: ?? (GERMAN); 1 VEHICLE DESTR, 6 DAMAGED (BRITISH)  
 OTHER FACTORS: MANY SHELLS DID NOT EXPLODE

OTHER RESULTS: NONE - NO FOLLOW-ON ATTACK PLANNED  
 SUPPRESSION: TEMPORARY SUPPRESSION, BUT EFFECT TRANSITORY DUE TO LOW LEVEL OF CASUALTIES

----- CALCULATED DATA -----

RDS/SQ YD: TARGET LEVEL  
 RDS/SQ YD/MIN: TARGET LEVEL  
 LBS/SQ YD: TARGET LEVEL  
 LBS/SQ YD/MIN: TARGET LEVEL  
 LBS/SQ YD (EQ): TARGET LEVEL  
 LBS/SQ YD/MIN (EQ): TARGET LEVEL

## TARGET

SERIAL:	10.01	
TARGET NUMBER:	1	
NUMBER PHASES:	2	
TIME:	??	
----- TARGET DATA -----		
TARGET:	HQ OF FD REGT: PERSONNEL IN SLIT TRENCHES, VEHICLES DUG IN	
TARGET AREA:	6000	
TARGET TACTICS:	8 MIN HVY BOMBARDMENT FOLLOWED BY 90 MIN OF REDUCED INTENSITY	
----- FIRING DATA -----		
FIRE UNIT:	PHASE LEVEL	
TYPE WEAPONS:	PHASE LEVEL	
NUMBER TUBES:	PHASE LEVEL	
TYPE AMMO:	PHASE LEVEL	
ROUNDS PER GUN:	PHASE LEVEL	
NUMBER ROUNDS:	PHASE LEVEL	
FIRE DURATION:	98	
----- RESULTS DATA -----		
ATTACK DELAY TIME:	SERIAL LEVEL	
TIME TO OBJECTIVE:	SERIAL LEVEL	
CASUALTIES:	SERIAL LEVEL	
EQUIPMENT DAMAGE:	SERIAL LEVEL	
OTHER FACTORS:	SERIAL LEVEL	
OTHER RESULTS:	SERIAL LEVEL	
SUPPRESSION:	SERIAL LEVEL	
----- CALCULATED DATA -----		
RDS/SQ YD:	0.0467 MIXED J,K,L	
RDS/SQ YD/MIN:	?? MIXED J,K,L	
LBS/SQ YD:	UNCERTAIN DUE TO LARGE NUMBER OF SHELLS THAT DID NOT EXPLODE	
LBS/SQ YD/MIN:	UNCERTAIN DUE TO LARGE NUMBER OF SHELLS THAT DID NOT EXPLODE	
LBS/SQ YD (EQ):	UNCERTAIN DUE TO LARGE NUMBER OF SHELLS THAT DID NOT EXPLODE	
LBS/SQ YD/MIN (EQ):	UNCERTAIN DUE TO LARGE NUMBER OF SHELLS THAT DID NOT EXPLODE	

## PHASE

SERIAL:	10.01	
TARGET NUMBER:	1	
PHASE NUMBER:	1	
TIME:	Z	
----- TARGET DATA -----		
TARGET:	TARGET LEVEL	
TARGET AREA:	TARGET LEVEL	
PHASE TACTICS:	CONCENTRATION	
----- FIRING DATA -----		
FIRE UNIT:	??	
TYPE WEAPONS:	J,K,L	
NUMBER TUBES:	??J,??K,??L	
TYPE AMMO:	??J,??K,??L	
ROUNDS PER GUN:	??J,??K,??L	
NUMBER ROUNDS:	100 MIXED J,K,L	
FIRE DURATION:	8	
----- RESULTS DATA -----		
ATTACK DELAY TIME:	SERIAL LEVEL	
TIME TO OBJECTIVE:	SERIAL LEVEL	
CASUALTIES:	SERIAL LEVEL	
EQUIPMENT DAMAGE:	SERIAL LEVEL	
OTHER FACTORS:	SERIAL LEVEL	
OTHER RESULTS:	SERIAL LEVEL	
SUPPRESSION:	SERIAL LEVEL	
----- CALCULATED DATA -----		
RDS/SQ YD:	TARGET LEVEL	
RDS/SQ YD/MIN:	TARGET LEVEL	
LBS/SQ YD:	TARGET LEVEL	
LBS/SQ YD/MIN:	TARGET LEVEL	
LBS/SQ YD (EQ):	TARGET LEVEL	
LBS/SQ YD/MIN (EQ):	TARGET LEVEL	

# PHASE

SERIAL:	10.01
TARGET NUMBER:	1
PHASE NUMBER:	2
TIME:	Z+8
----- TARGET DATA -----	
TARGET:	TARGET LEVEL
TARGET AREA:	TARGET LEVEL
PHASE TACTICS:	CONCENTRATION
----- FIRING DATA -----	
FIRE UNIT:	??
TYPE WEAPONS:	K
NUMBER TUBES:	??K
TYPE AMMO:	??K
ROUNDS PER GUN:	??K
NUMBER ROUNDS:	180K
FIRE DURATION:	90
----- RESULTS DATA -----	
ATTACK DELAY TIME:	SERIAL LEVEL
TIME TO OBJECTIVE:	SERIAL LEVEL
CASUALTIES:	SERIAL LEVEL
EQUIPMENT DAMAGE:	SERIAL LEVEL
OTHER FACTORS:	SERIAL LEVEL
OTHER RESULTS:	SERIAL LEVEL
SUPPRESSION:	SERIAL LEVEL
----- CALCULATED DATA -----	
RDS/SQ YD:	TARGET LEVEL
RDS/SQ YD/MIN:	TARGET LEVEL
LBS/SQ YD:	TARGET LEVEL
LBS/SQ YD/MIN:	TARGET LEVEL
LBS/SQ YD (EQ):	TARGET LEVEL
LBS/SQ YD/MIN (EQ):	TARGET LEVEL



## SERIAL

SERIAL: 10.02  
 REF NUMBER: A9  
 ORIG REF: IORS 1/24 PART II  
 REF TITLE: THE EFFECTIVENESS OF ARTILLERY IN ITALY, 1944  
 DATA SOURCE: ACTION REPORT NUMBER 2

----- SERIAL DATA -----

SIDE 1 COUNTRY: BRITAIN  
 SIDE 1 UNITS: 1 DIV  
 SIDE 1 POSTURE: ATTACKING  
 SIDE 2 COUNTRY: GERMANY  
 SIDE 2 UNITS: ??  
 SIDE 2 POSTURE: DEFENDING

DATE OF ACTION: MANY NIGHTS  
 COUNTRY: ITALY  
 REGION: ??  
 TERRAIN: ??  
 WEATHER: ??  
 TIME: 2100-0300, 1030-1230, 1300-1700, 2230-0500

SERIAL TACTICS: HARRASSING FIRE OVER MANY NIGHTS

NO. BMBRD TARGETS: ??  
 NO. PHASES/TGT: ??

----- TARGET DATA -----

BOMBARD TARGET: VARIOUS ENEMY POSITIONS  
 BOMBARD TGT AREA: ??  
 BOMBARD TACTICS: ONE BATTERY PER TARGET

----- FIRING DATA -----

FIRE UNIT: FD BATT, MD BATT, HV BATT  
 TYPE WEAPONS: ??  
 NUMBER TUBES: ??  
 TYPE AMMO: ??  
 ROUNDS PER GUN: 10-20 PER HR FD, 3 PER HR MD, 3 PER HR HV  
 NUMBER ROUNDS: ??  
 FIRE DURATION: 2 TO 6 HOURS

----- RESULTS DATA -----

ATTACK DELAY TIME: N/A  
 TIME TO OBJECTIVE: N/A  
 CASUALTIES: MANY POWS SURRENDERED (GERMAN); ?? (BRITISH)  
 EQUIPMENT DAMAGE: ??; ??  
 OTHER FACTORS: ??

OTHER RESULTS: ??  
 SUPPRESSION: POWS INDICATED THAT EFFECT ON MORALE WAS GREAT

----- CALCULATED DATA -----

RDS/SQ YD: ??  
 RDS/SQ YD/MIN: ??  
 LBS/SQ YD: ??  
 LBS/SQ YD/MIN: ??  
 LBS/SQ YD (EQ): ??  
 LBS/SQ YD/MIN (EQ): ??



## SERIAL

SERIAL: 10.03  
REF NUMBER: A9  
ORIG REF: IORS 1/24 PART II  
REF TITLE: THE EFFECTIVENESS OF ARTILLERY IN ITALY, 1944  
DATA SOURCE: ACTION REPORT NUMBER 3

----- SERIAL DATA -----  
SIDE 1 COUNTRY: BRITAIN  
SIDE 1 UNITS: 1 MD REGT  
SIDE 1 POSTURE: ATTACKING  
SIDE 2 COUNTRY: GERMANY  
SIDE 2 UNITS: 1 TROOP  
SIDE 2 POSTURE: DEFENDING

DATE OF ACTION: ??  
COUNTRY: ITALY  
REGION: ??  
TERRAIN: ??  
WEATHER: ??  
TIME: ??

SERIAL TACTICS: COUNTERBATTERY FIRE @ 3:1 OR 4:1 TO ENEMY UNIT

NO. BMBRD TARGETS: ??  
NO. PHASES/TGT: ??

----- TARGET DATA -----  
BOMBARD TARGET: ARTY TROOPS WHOSE POSITION WAS KNOWN TO WITHIN 200 YARDS

BOMBARD TGT AREA: ??  
BOMBARD TACTICS: ??

----- FIRING DATA -----  
FIRE UNIT: ??  
TYPE WEAPONS: ??  
NUMBER TUBES: ??  
TYPE AMMO: ??  
ROUNDS PER GUN: ??  
NUMBER ROUNDS: ??  
FIRE DURATION: ??

----- RESULTS DATA -----  
ATTACK DELAY TIME: ??  
TIME TO OBJECTIVE: ??  
CASUALTIES: ??  
EQUIPMENT DAMAGE: ??  
OTHER FACTORS: ??

OTHER RESULTS: ??  
SUPPRESSION: HEAVY BOMBARDMENT ON ACTIVE ENEMY UNITS OFTEN SILENCED TARGET BATTERIES PERMANENTLY

----- CALCULATED DATA -----  
RDS/SQ YD: ??  
RDS/SQ YD/MIN: ??  
LBS/SQ YD: ??  
LBS/SQ YD/MIN: ??  
LBS/SQ YD (EQ): ??  
LBS/SQ YD/MIN (EQ): ??



## SERIAL

SERIAL: 10.04  
REF NUMBER: A9  
ORIG REF: IORS 1/24 PART II  
REF TITLE: THE EFFECTIVENESS OF ARTILLERY IN ITALY, 1944  
DATA SOURCE: ACTION REPORT NUMBER 4

### SERIAL DATA

SIDE 1 COUNTRY: BRITAIN  
SIDE 1 UNITS: ??  
SIDE 1 POSTURE: ATTACKING  
SIDE 2 COUNTRY: GERMANY  
SIDE 2 UNITS: ??  
SIDE 2 POSTURE: DEFENDING

DATE OF ACTION: UNKNOWN  
COUNTRY: ITALY  
REGION: ??  
TERRAIN: ??  
WEATHER: ??  
TIME: ??

SERIAL TACTICS: SUPPRESS GERMAN POSITION

NO. BMBRD TARGETS: 1  
NO. PHASES/TGT: 1

### TARGET DATA

BOMBARD TARGET: PHASE LEVEL

BOMBARD TGT AREA: PHASE LEVEL  
BOMBARD TACTICS: TARGET LEVEL

### FIRING DATA

FIRE UNIT: PHASE LEVEL  
TYPE WEAPONS: PHASE LEVEL  
NUMBER TUBES: PHASE LEVEL  
TYPE AMMO: PHASE LEVEL  
ROUNDS PER GUN: PHASE LEVEL  
NUMBER ROUNDS: PHASE LEVEL  
FIRE DURATION: TARGET LEVEL AND PHASE LEVEL

### RESULTS DATA

ATTACK DELAY TIME: N/A  
TIME TO OBJECTIVE: N/A  
CASUALTIES: NOT KNOWN, PROBABLY NONE (GERMAN);?? (BRITISH)  
EQUIPMENT DAMAGE: HOUSE WAS NOT DEMOLISHED (GERMAN);?? (BRITISH)  
OTHER FACTORS: NONE

OTHER RESULTS: GERMANS NOT DRIVEN OUT  
SUPPRESSION: ??

### CALCULATED DATA

RDS/SQ YD: PHASE LEVEL  
RDS/SQ YD/MIN: PHASE LEVEL  
LBS/SQ YD: PHASE LEVEL  
LBS/SQ YD/MIN: PHASE LEVEL  
LBS/SQ YD (EQ): PHASE LEVEL  
LBS/SQ YD/MIN (EQ): PHASE LEVEL

## TARGET

SERIAL: 10.04  
TARGET NUMBER: 1  
NUMBER PHASES: 1  
TIME: UNKNOWN  
----- TARGET DATA -----  
TARGET: PHASE LEVEL  
  
TARGET AREA: PHASE LEVEL  
TARGET TACTICS: ELEVEN ROUNDS FOR RANGE, 16 FOR EFFECT  
  
----- FIRING DATA -----  
FIRE UNIT: PHASE LEVEL  
TYPE WEAPONS: PHASE LEVEL  
NUMBER TUBES: PHASE LEVEL  
TYPE AMMO: PHASE LEVEL  
ROUNDS PER GUN: PHASE LEVEL  
NUMBER ROUNDS: PHASE LEVEL  
FIRE DURATION: ??  
  
----- RESULTS DATA -----  
ATTACK DELAY TIME: SERIAL LEVEL  
TIME TO OBJECTIVE: SERIAL LEVEL  
CASUALTIES: SERIAL LEVEL  
EQUIPMENT DAMAGE: SERIAL LEVEL  
OTHER FACTORS: SERIAL LEVEL  
  
OTHER RESULTS: SERIAL LEVEL  
SUPPRESSION: SERIAL LEVEL  
  
----- CALCULATED DATA -----  
RDS/SQ YD: PHASE LEVEL  
RDS/SQ YD/MIN: PHASE LEVEL  
LBS/SQ YD: PHASE LEVEL  
LBS/SQ YD/MIN: PHASE LEVEL  
LBS/SQ YD (EQ): PHASE LEVEL  
LBS/SQ YD/MIN (EQ): PHASE LEVEL

## PHASE

SERIAL: 10.04  
TARGET NUMBER: 1  
PHASE NUMBER: 1  
TIME: UNKNOWN  
----- TARGET DATA -----  
TARGET: GERMAN STRONG-POINT IN HOUSE WITH BARBED WIRE DEFENSES  
  
TARGET AREA: 2000  
PHASE TACTICS: CONCENTRATION  
  
----- FIRING DATA -----  
FIRE UNIT: 2 X 7.2 IN HOWITZERS  
TYPE WEAPONS: H  
NUMBER TUBES: 2H  
TYPE AMMO: HE117 H  
ROUNDS PER GUN: 8H  
NUMBER ROUNDS: 16H  
FIRE DURATION: ??  
  
----- RESULTS DATA -----  
ATTACK DELAY TIME: SERIAL LEVEL  
TIME TO OBJECTIVE: SERIAL LEVEL  
CASUALTIES: SERIAL LEVEL  
EQUIPMENT DAMAGE: SERIAL LEVEL  
OTHER FACTORS: SERIAL LEVEL  
  
OTHER RESULTS: SERIAL LEVEL  
SUPPRESSION: SERIAL LEVEL  
  
----- CALCULATED DATA -----  
RDS/SQ YD: 0.008H  
RDS/SQ YD/MIN: ??H  
LBS/SQ YD: 1.616H  
LBS/SQ YD/MIN: ??H  
LBS/SQ YD (EQ): 0.784H  
LBS/SQ YD/MIN (EQ): ??H

SERIAL

SERIAL: 10.05  
REF NUMBER: A9  
ORIG REF: 10RS 1/24 PART II  
REF TITLE: THE EFFECTIVENESS OF ARTILLERY IN ITALY, 1944  
DATA SOURCE: ACTION REPORT NUMBER 5

----- SERIAL DATA -----

SIDE 1 COUNTRY: N/A  
SIDE 1 UNITS: N/A  
SIDE 1 POSTURE: N/A  
SIDE 2 COUNTRY: N/A  
SIDE 2 UNITS: N/A  
SIDE 2 POSTURE: N/A

DATE OF ACTION: 09/30/44  
COUNTRY: ITALY  
REGION: IL CASONE  
TERRAIN: N/A  
WEATHER: N/A  
TIME: N/A

SERIAL TACTICS: UNTER OFFIZIER NEUMAN 2 BN 578 GREN REGT TAKEN PRISONER PROVIDES SUB  
J EVAL OF EFFECT OF BOMBARDMENT

NO. EMBRD TARGETS: N/A  
NO. PHASES/TGT: N/A

----- TARGET DATA -----

BOMBARD TARGET: N/A

BOMBARD TGT AREA: N/A  
BOMBARD TACTICS: N/A

----- FIRING DATA -----

FIRE UNIT: N/A  
TYPE WEAPONS: N/A  
NUMBER TUBES: N/A  
TYPE AMMO: N/A  
ROUNDS PER GUN: N/A  
NUMBER ROUNDS: N/A  
FIRE DURATION: N/A

----- RESULTS DATA -----

ATTACK DELAY TIME: N/A  
TIME TO OBJECTIVE: N/A  
CASUALTIES: N/A  
EQUIPMENT DAMAGE: N/A  
OTHER FACTORS: POW EXPRESSED SPECIAL DISLIKE FOR HARRASSING FIRE

OTHER RESULTS: N/A  
SUPPRESSION: POW ESTIMATED EFFECT OF BOMBARDMENT DISAPPEARED AFTER 3 MINUTES BECA  
USE GERMANS KNEW INFANTRY ATTACKS FOLLOWED BOMBARDMENT

----- CALCULATED DATA -----

RDS/SQ YD: N/A  
RDS/SQ YD/MIN: N/A  
LBS/SQ YD: N/A  
LBS/SQ YD/MIN: N/A  
LBS/SQ YD (EQ): N/A  
LBS/SQ YD/MIN (EQ): N/A



## SERIAL

SERIAL: 10.06  
 REF NUMBER: A9  
 ORIG REF: 1ORS 1/24 PART II  
 REF TITLE: THE EFFECTIVENESS OF ARTILLERY IN ITALY, 1944  
 DATA SOURCE: ACTION REPORT NUMBER 6

----- SERIAL DATA -----

SIDE 1 COUNTRY: BRITAIN  
 SIDE 1 UNITS: ??  
 SIDE 1 POSTURE: ATTACKING  
 SIDE 2 COUNTRY: GERMANY  
 SIDE 2 UNITS: ??  
 SIDE 2 POSTURE: DEFENDING

DATE OF ACTION: UNKNOWN  
 COUNTRY: ITALY  
 REGION: ??  
 TERRAIN: ??  
 WEATHER: ??  
 TIME: ??

SERIAL TACTICS: ATTEMPT TO SILENCE GERMAN SP GUN

NO. BMBRD TARGETS: 1  
 NO. PHASES/TGT: 1

----- TARGET DATA -----

BOMBARD TARGET: PHASE LEVEL

BOMBARD TGT AREA: PHASE LEVEL  
 BOMBARD TACTICS: TARGET LEVEL

----- FIRING DATA -----

FIRE UNIT: PHASE LEVEL  
 TYPE WEAPONS: PHASE LEVEL  
 NUMBER TUBES: PHASE LEVEL  
 TYPE AMMO: PHASE LEVEL  
 ROUNDS PER GUN: PHASE LEVEL  
 NUMBER ROUNDS: PHASE LEVEL  
 FIRE DURATION: TARGET LEVEL AND PHASE LEVEL

----- RESULTS DATA -----

ATTACK DELAY TIME: N/A  
 TIME TO OBJECTIVE: N/A  
 CASUALTIES: PROBABLY NONE (GERMAN); ?? (BRITISH)  
 EQUIPMENT DAMAGE: ??; ??  
 OTHER FACTORS: NONE

OTHER RESULTS: GUN WAS NOT SILENCED  
 SUPPRESSION: ??

----- CALCULATED DATA -----

RDS/SQ YD: PHASE LEVEL  
 RDS/SQ YD/MIN: PHASE LEVEL  
 LBS/SQ YD: PHASE LEVEL  
 LBS/SQ YD/MIN: PHASE LEVEL  
 LBS/SQ YD (EQ): PHASE LEVEL  
 LBS/SQ YD/MIN (EQ): PHASE LEVEL

## TARGET

SERIAL:	10.06
TARGET NUMBER:	1
NUMBER PHASES:	1
TIME:	UNKNOWN
----- TARGET DATA -----	
TARGET:	PHASE LEVEL
TARGET AREA:	PHASE LEVEL
TARGET TACTICS:	CONCENTRATE FIRE TO SILENCE GUN
----- FIRING DATA -----	
FIRE UNIT:	PHASE LEVEL
TYPE WEAPONS:	PHASE LEVEL
NUMBER TUBES:	PHASE LEVEL
TYPE AMMO:	PHASE LEVEL
ROUNDS PER GUN:	PHASE LEVEL
NUMBER ROUNDS:	PHASE LEVEL
FIRE DURATION:	??
----- RESULTS DATA -----	
ATTACK DELAY TIME:	SERIAL LEVEL
TIME TO OBJECTIVE:	SERIAL LEVEL
CASUALTIES:	SERIAL LEVEL
EQUIPMENT DAMAGE:	SERIAL LEVEL
OTHER FACTORS:	SERIAL LEVEL
OTHER RESULTS:	SERIAL LEVEL
SUPPRESSION:	SERIAL LEVEL
----- CALCULATED DATA -----	
RDS/SQ YD:	PHASE LEVEL
RDS/SQ YD/MIN:	PHASE LEVEL
LBS/SQ YD:	PHASE LEVEL
LBS/SQ YD/MIN:	PHASE LEVEL
LBS/SQ YD (EQ):	PHASE LEVEL
LBS/SQ YD/MIN (EQ):	PHASE LEVEL

## PHASE

SERIAL:	10.06
TARGET NUMBER:	1
PHASE NUMBER:	1
TIME:	UNKNOWN
----- TARGET DATA -----	
TARGET:	GERMAN SP GUN
TARGET AREA:	60000
PHASE TACTICS:	CONCENTRATION
----- FIRING DATA -----	
FIRE UNIT:	??
TYPE WEAPONS:	A
NUMBER TUBES:	16A
TYPE AMMO:	??A
ROUNDS PER GUN:	10.5A
NUMBER ROUNDS:	168A
FIRE DURATION:	??
----- RESULTS DATA -----	
ATTACK DELAY TIME:	SERIAL LEVEL
TIME TO OBJECTIVE:	SERIAL LEVEL
CASUALTIES:	SERIAL LEVEL
EQUIPMENT DAMAGE:	SERIAL LEVEL
OTHER FACTORS:	SERIAL LEVEL
OTHER RESULTS:	SERIAL LEVEL
SUPPRESSION:	SERIAL LEVEL
----- CALCULATED DATA -----	
RDS/SQ YD:	0.0028A
RDS/SQ YD/MIN:	??A
LBS/SQ YD:	0.07A
LBS/SQ YD/MIN:	??A
LBS/SQ YD (EQ):	0.07A
LBS/SQ YD/MIN (EQ):	??A

## SERIAL

SERIAL: 10.07  
REF NUMBER: AS  
ORIG REF: IORS 1/24 PART II  
REF TITLE: THE EFFECTIVENESS OF ARTILLERY IN ITALY, 1944  
DATA SOURCE: ACTION REPORT NUMBER 7

----- SERIAL DATA -----  
SIDE 1 COUNTRY: N/A  
SIDE 1 UNITS: N/A  
SIDE 1 POSTURE: N/A  
SIDE 2 COUNTRY: N/A  
SIDE 2 UNITS: N/A  
SIDE 2 POSTURE: N/A

DATE OF ACTION: N/A  
COUNTRY: ITALY  
REGION: N/A  
TERRAIN: N/A  
WEATHER: N/A  
TIME: N/A

SERIAL TACTICS: SUBJECTIVE DATA PROVIDED BY SUCCESSFUL UNIT OC AND SUPPORTING ARTY C  
OMMANDER

NO. BMRD TARGETS: N/A  
NO. PHASES/TGT: N/A

----- TARGET DATA -----  
BOMBARD TARGET: N/A

BOMBARD TGT AREA: N/A  
BOMBARD TACTICS: N/A

----- FIRING DATA -----  
FIRE UNIT: N/A  
TYPE WEAPONS: N/A  
NUMBER TUBES: N/A  
TYPE AMMO: N/A  
ROUNDS PER GUN: N/A  
NUMBER ROUNDS: N/A  
FIRE DURATION: N/A

----- RESULTS DATA -----  
ATTACK DELAY TIME: N/A  
TIME TO OBJECTIVE: N/A  
CASUALTIES: N/A  
EQUIPMENT DAMAGE: N/A  
OTHER FACTORS: BOMBARDMENT ALERTED ENEMY TO ATTACK BUT LOWERED MORALE

OTHER RESULTS: HARRASSING FIRE TO CUT ENEMY SUPPLY LINES WAS EFFECTIVE  
SUPPRESSION: 4 HOUR PRELIMINARY BOMBARDMENTS AT SLOW RATE AND DIRECT FIRE WERE EF  
FECTIVE

----- CALCULATED DATA -----  
RDS/SQ YD: N/A  
RDS/SQ YD/MIN: N/A  
LBS/SQ YD: N/A  
LBS/SQ YD/MIN: N/A  
LBS/SQ YD (EQ): N/A  
LBS/SQ YD/MIN (EQ): N/A



## SERIAL

```

SERIAL:          10.08
REF NUMBER:     A9
ORIG REF:       1ORS 1/24 PART II
REF TITLE:      THE EFFECTIVENESS OF ARTILLERY IN ITALY, 1944
DATA SOURCE:    ACTION REPORT NUMBER 8
----- SERIAL DATA -----
SIDE 1 COUNTRY: BRITAIN
SIDE 1 UNITS:   3 FD REGT, 1 MD REGT, 1 HV BATT
SIDE 1 POSTURE: ATTACKING
SIDE 2 COUNTRY: GERMANY
SIDE 2 UNITS:   ??
SIDE 2 POSTURE: DEFENDING

DATE OF ACTION: ??
COUNTRY:        ITALY
REGION:         ??
TERRAIN:        HILL TOP
WEATHER:        ??
TIME:           2300

SERIAL TACTICS: EMPLOY CRASH AND HARASS PLAN TO SUPPORT ATTACK BY FORCING GERMANS TO
                EVACUATE POSITIONS.
NO. BMBRD TARGETS: 2
NO. PHASES/TGT:  7/10
----- TARGET DATA -----
BOMBARD TARGET:  TARGET LEVEL

BOMBARD TGT AREA: TARGET LEVEL
BOMBARD TACTICS: TARGET LEVEL

----- FIRING DATA -----
FIRE UNIT:       PHASE LEVEL
TYPE WEAPONS:    PHASE LEVEL
NUMBER TUBES:    PHASE LEVEL
TYPE AMMO:       PHASE LEVEL
ROUNDS PER GUN:  PHASE LEVEL
NUMBER ROUNDS:   PHASE LEVEL
FIRE DURATION:   TARGET LEVEL AND PHASE LEVEL
----- RESULTS DATA -----
ATTACK DELAY TIME: ??
TIME TO OBJECTIVE: ??
CASUALTIES:      UNKNOWN (GERMAN);UNKNOWN (BRITISH)
EQUIPMENT DAMAGE: ??;??
OTHER FACTORS:   NONE

OTHER RESULTS:   ??
SUPPRESSION:     POSITION WAS NOT SUPPRESSED AT THE TIME OF THE INFANTRY ATTACK;POSIT
                ION WAS STRONGLY DEFENDED BY MG FIRE WHEN INFANTRY ADVANCED

----- CALCULATED DATA -----
RDS/SQ YD:       TARGET LEVEL
RDS/SQ YD/MIN:   TARGET LEVEL
LBS/SQ YD:       TARGET LEVEL
LBS/SQ YD/MIN:   TARGET LEVEL
LBS/SQ YD (EQ):  TARGET LEVEL
LBS/SQ YD/MIN (EQ): TARGET LEVEL
    
```

## TARGET

```

SERIAL: 10.08
TARGET NUMBER: 1
NUMBER PHASES: 7
TIME: 2200
----- TARGET DATA -----
TARGET: GERMAN POSITIONS ON HILL TOP

TARGET AREA: 1875000
TARGET TACTICS: THREE CRASH PHASES (1,4,5) AND FOUR HARASS PHASES (2,3,6,7)

----- FIRING DATA -----
FIRE UNIT: PHASE LEVEL
TYPE WEAPONS: PHASE LEVEL
NUMBER TUBES: PHASE LEVEL
TYPE AMMO: PHASE LEVEL
ROUNDS PER GUN: PHASE LEVEL
NUMBER ROUNDS: PHAS
FIRE DURATION: 120

----- RESULTS -----
ATTACK DELAY TIME: SERIAL LEVEL
TIME TO OBJECTIVE: SERIAL LEVEL
CASUALTIES: SERIAL LEVEL
EQUIPMENT DAMAGE: SERIAL LEVEL
OTHER FACTORS: SERIAL LEVEL

OTHER RESULTS: SERIAL LEVEL
SUPPRESSION: SERIAL LEVEL

----- CALCULATED DATA -----
RDS/SQ YD: 0.000371A,0.000103F
RDS/SQ YD/MIN: ??A,??F
LBS/SQ YD: 0.00928A,0.0087F
LBS/SQ YD/MIN: ??A,??F
LBS/SQ YD (EQ): 0.00928A,0.00722F
LBS/SQ YD/MIN (EQ): ??A,??F
    
```

## PHASE

```

SERIAL: 10.08
TARGET NUMBER: 1
PHASE NUMBER: 1
TIME: 2200
----- TARGET DATA -----
TARGET: TARGET LEVEL

TARGET AREA: TARGET LEVEL
PHASE TACTICS: CRASH

----- FIRING DATA -----
FIRE UNIT: 2 FD TROOPS, 1 MD BATT
TYPE WEAPONS: A,F
NUMBER TUBES: 8A,4F
TYPE AMMO: ??A,??F
ROUNDS PER GUN: 6A,3F
NUMBER ROUNDS: 48A,12F
FIRE DURATION: ??

----- RESULTS DATA -----
ATTACK DELAY TIME: SERIAL LEVEL
TIME TO OBJECTIVE: SERIAL LEVEL
CASUALTIES: SERIAL LEVEL
EQUIPMENT DAMAGE: SERIAL LEVEL
OTHER FACTORS: SERIAL LEVEL

OTHER RESULTS: SERIAL LEVEL
SUPPRESSION: SERIAL LEVEL

----- CALCULATED DATA -----
RDS/SQ YD: TARGET LEVEL
RDS/SQ YD/MIN: TARGET LEVEL
LBS/SQ YD: TARGET LEVEL
LBS/SQ YD/MIN: TARGET LEVEL
LBS/SQ YD (EQ): TARGET LEVEL
LBS/SQ YD/MIN (EQ): TARGET LEVEL
    
```

## PHASE

```

SERIAL:          10.08
TARGET NUMBER:   1
PHASE NUMBER:    2
TIME:            2200
----- TARGET DATA -----
TARGET:          TARGET LEVEL

TARGET AREA:     TARGET LEVEL
PHASE TACTICS:   SUSTAINED FIRE

----- FIRING DATA -----
FIRE UNIT:       2 FD TROOPS, 1 MD TROOP
TYPE WEAPONS:    A, F
NUMBER TUBES:    8A, 4F
TYPE AMMO:       ??A, ??F
ROUNDS PER GUN:  20A, 10F
NUMBER ROUNDS:   160A, 40F
FIRE DURATION:   30

----- RESULTS DATA -----
ATTACK DELAY TIME: SERIAL LEVEL
TIME TO OBJECTIVE: SERIAL LEVEL
CASUALTIES:      SERIAL LEVEL
EQUIPMENT DAMAGE: SERIAL LEVEL
OTHER FACTORS:   SERIAL LEVEL

OTHER RESULTS:   SERIAL LEVEL
SUPPRESSION:     SERIAL LEVEL

----- CALCULATED DATA -----
RDS/SQ YD:       TARGET LEVEL
RDS/SQ YD/MIN:   TARGET LEVEL
LBS/SQ YD:       TARGET LEVEL
LBS/SQ YD/MIN:   TARGET LEVEL
LBS/SQ YD (EQ): TARGET LEVEL
LBS/SQ YD/MIN (EQ): TARGET LEVEL
  
```

## PHASE

```

SERIAL:          10.08
TARGET NUMBER:   1
PHASE NUMBER:    3
TIME:            2235
----- TARGET DATA -----
TARGET:          TARGET LEVEL

TARGET AREA:     TARGET LEVEL
PHASE TACTICS:   SUSTAINED FIRE

----- FIRING DATA -----
FIRE UNIT:       2 FD TROOPS, 1 MD TROOP
TYPE WEAPONS:    A, F
NUMBER TUBES:    8A, 4F
TYPE AMMO:       ??A, ??F
ROUNDS PER GUN:  12A, 6F
NUMBER ROUNDS:   96A, 24F
FIRE DURATION:   10

----- RESULTS DATA -----
ATTACK DELAY TIME: SERIAL LEVEL
TIME TO OBJECTIVE: SERIAL LEVEL
CASUALTIES:      SERIAL LEVEL
EQUIPMENT DAMAGE: SERIAL LEVEL
OTHER FACTORS:   SERIAL LEVEL

OTHER RESULTS:   SERIAL LEVEL
SUPPRESSION:     SERIAL LEVEL

----- CALCULATED DATA -----
RDS/SQ YD:       TARGET LEVEL
RDS/SQ YD/MIN:   TARGET LEVEL
LBS/SQ YD:       TARGET LEVEL
LBS/SQ YD/MIN:   TARGET LEVEL
LBS/SQ YD (EQ): TARGET LEVEL
LBS/SQ YD/MIN (EQ): TARGET LEVEL
  
```

## PHASE

SERIAL:	10.08
TARGET NUMBER:	1
PHASE NUMBER:	4
TIME:	2246
----- TARGET DATA -----	
TARGET:	TARGET LEVEL
TARGET AREA:	TARGET LEVEL
PHASE TACTICS:	CRASH
----- FIRING DATA -----	
FIRE UNIT:	2 FD TROOPS, 1 MD TROOP
TYPE WEAPONS:	A, F
NUMBER TUBES:	8A, 4F
TYPE AMMO:	??A, ??F
ROUNDS PER GUN:	4A, 2F
NUMBER ROUNDS:	32A, 8F
FIRE DURATION:	??
----- RESULTS DATA -----	
ATTACK DELAY TIME:	SERIAL LEVEL
TIME TO OBJECTIVE:	SERIAL LEVEL
CASUALTIES:	SERIAL LEVEL
EQUIPMENT DAMAGE:	SERIAL LEVEL
OTHER FACTORS:	SERIAL LEVEL
OTHER RESULTS:	SERIAL LEVEL
SUPPRESSION:	SERIAL LEVEL
----- CALCULATED DATA -----	
RDS/SQ YD:	TARGET LEVEL
RDS/SQ YD/MIN:	TARGET LEVEL
LBS/SQ YD:	TARGET LEVEL
LBS/SQ YD/MIN:	TARGET LEVEL
LBS/SQ YD (EQ):	TARGET LEVEL
LBS/SQ YD/MIN (EQ):	TARGET LEVEL

## PHASE

SERIAL:	10.08
TARGET NUMBER:	1
PHASE NUMBER:	5
TIME:	2300
----- TARGET DATA -----	
TARGET:	TARGET LEVEL
TARGET AREA:	TARGET LEVEL
PHASE TACTICS:	CRASH
----- FIRING DATA -----	
FIRE UNIT:	2 FD TROOPS, 1 MD TROOP
TYPE WEAPONS:	A, F
NUMBER TUBES:	8A, 4F
TYPE AMMO:	??A, ??F
ROUNDS PER GUN:	10A, 5F
NUMBER ROUNDS:	80A, 20F
FIRE DURATION:	??
----- RESULTS DATA -----	
ATTACK DELAY TIME:	SERIAL LEVEL
TIME TO OBJECTIVE:	SERIAL LEVEL
CASUALTIES:	SERIAL LEVEL
EQUIPMENT DAMAGE:	SERIAL LEVEL
OTHER FACTORS:	SERIAL LEVEL
OTHER RESULTS:	SERIAL LEVEL
SUPPRESSION:	SERIAL LEVEL
----- CALCULATED DATA -----	
RDS/SQ YD:	TARGET LEVEL
RDS/SQ YD/MIN:	TARGET LEVEL
LBS/SQ YD:	TARGET LEVEL
LBS/SQ YD/MIN:	TARGET LEVEL
LBS/SQ YD (EQ):	TARGET LEVEL
LBS/SQ YD/MIN (EQ):	TARGET LEVEL

## PHASE

SERIAL:	10.08
TARGET NUMBER:	1
PHASE NUMBER:	8
TIME:	2305
----- TARGET DATA -----	
TARGET:	TARGET LEVEL
TARGET AREA:	TARGET LEVEL
PHASE TACTICS:	SUSTAINED FIRE
----- FIRING DATA -----	
FIRE UNIT:	2 FD TROOPS, 1 MD TROOP
TYPE WEAPONS:	A, F
NUMBER TUBES:	8A, 4F
TYPE AMMO:	??A, ??F
ROUNDS PER GUN:	15A, 15F
NUMBER ROUNDS:	120A, 40F
FIRE DURATION:	25
----- RESULTS DATA -----	
ATTACK DELAY TIME:	SERIAL LEVEL
TIME TO OBJECTIVE:	SERIAL LEVEL
CASUALTIES:	SERIAL LEVEL
EQUIPMENT DAMAGE:	SERIAL LEVEL
OTHER FACTORS:	SERIAL LEVEL
OTHER RESULTS:	SERIAL LEVEL
SUPPRESSION:	SERIAL LEVEL
----- CALCULATED DATA -----	
RDS/SQ YD:	TARGET LEVEL
RDS/SQ YD/MIN:	TARGET LEVEL
LBS/SQ YD:	TARGET LEVEL
LBS/SQ YD/MIN:	TARGET LEVEL
LBS/SQ YD (EQ):	TARGET LEVEL
LBS/SQ YD/MIN (EQ):	TARGET LEVEL

## PHASE

SERIAL:	10.08
TARGET NUMBER:	1
PHASE NUMBER:	7
TIME:	2330
----- TARGET DATA -----	
TARGET:	TARGET LEVEL
TARGET AREA:	TARGET LEVEL
PHASE TACTICS:	SUSTAINED FIRE
----- FIRING DATA -----	
FIRE UNIT:	2 FD TROOPS, 1 MD TROOP
TYPE WEAPONS:	A, F
NUMBER TUBES:	8A, 4F
TYPE AMMO:	??A, ??F
ROUNDS PER GUN:	20A, 10F
NUMBER ROUNDS:	120A, 60F
FIRE DURATION:	30
----- RESULTS DATA -----	
ATTACK DELAY TIME:	SERIAL LEVEL
TIME TO OBJECTIVE:	SERIAL LEVEL
CASUALTIES:	SERIAL LEVEL
EQUIPMENT DAMAGE:	SERIAL LEVEL
OTHER FACTORS:	SERIAL LEVEL
OTHER RESULTS:	SERIAL LEVEL
SUPPRESSION:	SERIAL LEVEL
----- CALCULATED DATA -----	
RDS/SQ YD:	TARGET LEVEL
RDS/SQ YD/MIN:	TARGET LEVEL
LBS/SQ YD:	TARGET LEVEL
LBS/SQ YD/MIN:	TARGET LEVEL
LBS/SQ YD (EQ):	TARGET LEVEL
LBS/SQ YD/MIN (EQ):	TARGET LEVEL

## TARGET

SERIAL: 10.08  
TARGET NUMBER: 2  
NUMBER PHASES: 10  
TIME: 2200

----- TARGET DATA -----  
TARGET: SUBSIDIARY TARGETS

TARGET AREA: 13125000  
TARGET TACTICS: FOUR CRASH PHASES (1,4,5,8) AND 6 HARASS PHASES (2,3,6,7,9,10)

----- FIRING DATA -----  
FIRE UNIT: PHASE LEVEL  
TYPE WEAPONS: PHASE LEVEL  
NUMBER TUBES: PHASE LEVEL  
TYPE AMMO: PHASE LEVEL  
ROUNDS PER GUN: PHASE LEVEL  
NUMBER ROUNDS: PHASE LEVEL  
FIRE DURATION: 480

----- RESULTS DATA -----  
ATTACK DELAY TIME: SERIAL LEVEL  
TIME TO OBJECTIVE: SERIAL LEVEL  
CASUALTIES: SERIAL LEVEL  
EQUIPMENT DAMAGE: SERIAL LEVEL  
OTHER FACTORS: SERIAL LEVEL

OTHER RESULTS: SERIAL LEVEL  
SUPPRESSION: SERIAL LEVEL

----- CALCULATED DATA -----  
RDS/SQ YD: 0.0G0766A,0.0000722F,0.000024H  
RDS/SQ YD/MIN: ??A,??F,??H  
LBS/SQ YD: 0.0191A,0.00578F,0.00485H  
LBS/SQ YD/MIN: ??A,??F,??H  
LBS/SQ YD (EQ): 0.0191A,0.00479F,0.00235H  
LBS/SQ YD/MIN (EQ): ??A,??F,??H

## PHASE

SERIAL: 10.08  
TARGET NUMBER: 2  
PHASE NUMBER: 1  
TIME: 2200

----- TARGET DATA -----  
TARGET: TARGET LEVEL

TARGET AREA: TARGET LEVEL  
PHASE TACTICS: CRASH

----- FIRING DATA -----  
FIRE UNIT: 3 FO REGT,1 MD REGT,1 HV BATT  
TYPE WEAPONS: A,F,M  
NUMBER TUBES: 64A,12F,8H  
TYPE AMMO: ??A,??F,??H  
ROUNDS PER GUN: 6A,3F,1.5H  
NUMBER ROUNDS: 384A,36F,12H  
FIRE DURATION: ??

----- RESULTS DATA -----  
ATTACK DELAY TIME: SERIAL LEVEL  
TIME TO OBJECTIVE: SERIAL LEVEL  
CASUALTIES: SERIAL LEVEL  
EQUIPMENT DAMAGE: SERIAL LEVEL  
OTHER FACTORS: SERIAL LEVEL

OTHER RESULTS: SERIAL LEVEL  
SUPPRESSION: SERIAL LEVEL

----- CALCULATED DATA -----  
RDS/SQ YD: TARGET LEVEL  
RDS/SQ YD/MIN: TARGET LEVEL  
LBS/SQ YD: TARGET LEVEL  
LBS/SQ YD/MIN: TARGET LEVEL  
LBS/SQ YD (EQ): TARGET LEVEL  
LBS/SQ YD/MIN (EQ): TARGET LEVEL

## PHASE

SERIAL:	10.08
TARGET NUMBER:	2
PHASE NUMBER:	2
TIME:	2200
----- TARGET DATA -----	
TARGET:	TARGET LEVEL
TARGET AREA:	TARGET LEVEL
PHASE TACTICS:	SUSTAINED FIRE
----- FIRING DATA -----	
FIRE UNIT:	3 FD REGT, 1 MD REGT, 1 HV BATT
TYPE WEAPONS:	A, F, H
NUMBER TUBES:	64A, 12F, 8H
TYPE AMMO:	??A, ??F, ??H
ROUNDS PER GUN:	20A, 10F, 5H
NUMBER ROUNDS:	1280A, 120F, 40H
FIRE DURATION:	30
----- RESULTS DATA -----	
ATTACK DELAY TIME:	SERIAL LEVEL
TIME TO OBJECTIVE:	SERIAL LEVEL
CASUALTIES:	SERIAL LEVEL
EQUIPMENT DAMAGE:	SERIAL LEVEL
OTHER FACTORS:	SERIAL LEVEL
OTHER RESULTS:	SERIAL LEVEL
SUPPRESSION:	SERIAL LEVEL
----- CALCULATED DATA -----	
RDS/SQ YD:	TARGET LEVEL
RDS/SQ YD/MIN:	TARGET LEVEL
LBS/SQ YD:	TARGET LEVEL
LBS/SQ YD/MIN:	TARGET LEVEL
LBS/SQ YD (EQ):	TARGET LEVEL
LBS/SQ YD/MIN (EQ):	TARGET LEVEL

## PHASE

SERIAL:	10.08
TARGET NUMBER:	2
PHASE NUMBER:	3
TIME:	2235
----- TARGET DATA -----	
TARGET:	TARGET LEVEL
TARGET AREA:	TARGET LEVEL
PHASE TACTICS:	SUSTAINED FIRE
----- FIRING DATA -----	
FIRE UNIT:	3 FD REGT, 1 MD REGT, 1 HV BATT
TYPE WEAPONS:	A, F, H
NUMBER TUBES:	64A, 12F, 8H
TYPE AMMO:	??A, ??F, ??H
ROUNDS PER GUN:	12A, 6F, 3H
NUMBER ROUNDS:	768A, 72F, 24H
FIRE DURATION:	10
----- RESULTS DATA -----	
ATTACK DELAY TIME:	SERIAL LEVEL
TIME TO OBJECTIVE:	SERIAL LEVEL
CASUALTIES:	SERIAL LEVEL
EQUIPMENT DAMAGE:	SERIAL LEVEL
OTHER FACTORS:	SERIAL LEVEL
OTHER RESULTS:	SERIAL LEVEL
SUPPRESSION:	SERIAL LEVEL
----- CALCULATED DATA -----	
RDS/SQ YD:	TARGET LEVEL
RDS/SQ YD/MIN:	TARGET LEVEL
LBS/SQ YD:	TARGET LEVEL
LBS/SQ YD/MIN:	TARGET LEVEL
LBS/SQ YD (EQ):	TARGET LEVEL
LBS/SQ YD/MIN (EQ):	TARGET LEVEL

## PHASE

```

SERIAL: 10.08
TARGET NUMBER: 2
PHASE NUMBER: 4
TIME: 2246
----- TARGET DATA -----
TARGET: TARGET LEVEL

TARGET AREA: TARGET LEVEL
PHASE TACTICS: CRASH

----- FIRING DATA -----
FIRE UNIT: 3 FD REGT, 1 MD REGT, 1 HV BATT
TYPE WEAPONS: A, F, H
NUMBER TUBES: 64A, 12F, 8H
TYPE AMMO: ??A, ??F, ??H
ROUNDS PER GUN: 4A, 2F, 1H
NUMBER ROUNDS: 256A, 24F, 8H
FIRE DURATION: ??

----- RESULTS DATA -----
ATTACK DELAY TIME: SERIAL LEVEL
TIME TO OBJECTIVE: SERIAL LEVEL
CASUALTIES: SERIAL LEVEL
EQUIPMENT DAMAGE: SERIAL LEVEL
OTHER FACTORS: SERIAL LEVEL

OTHER RESULTS: SERIAL LEVEL
SUPPRESSION: SERIAL LEVEL

----- CALCULATED DATA -----
RDS/SQ YD: TARGET LEVEL
RDS/SQ YD/MIN: TARGET LEVEL
LBS/SQ YD: TARGET LEVEL
LBS/SQ YD/MIN: TARGET LEVEL
LBS/SQ YD (EQ): TARGET LEVEL
LBS/SQ YD/MIN (EQ): TARGET LEVEL
    
```

## PHASE

```

SERIAL: 10.08
TARGET NUMBER: 2
PHASE NUMBER: 5
TIME: 2300
----- TARGET DATA -----
TARGET: TARGET LEVEL

TARGET AREA: TARGET LEVEL
PHASE TACTICS: CRASH

----- FIRING DATA -----
FIRE UNIT: 3 FD REGT, 1 MD REGT, 1 HV BATT
TYPE WEAPONS: A, F, H
NUMBER TUBES: 64A, 12F, 8H
TYPE AMMO: ??A, ??F, ??H
ROUNDS PER GUN: 10A, 5F, 2.5H
NUMBER ROUNDS: 640A, 80F, 20H
FIRE DURATION: ??

----- RESULTS DATA -----
ATTACK DELAY TIME: SERIAL LEVEL
TIME TO OBJECTIVE: SERIAL LEVEL
CASUALTIES: SERIAL LEVEL
EQUIPMENT DAMAGE: SERIAL LEVEL
OTHER FACTORS: SERIAL LEVEL

OTHER RESULTS: SERIAL LEVEL
SUPPRESSION: SERIAL LEVEL

----- CALCULATED DATA -----
RDS/SQ YD: TARGET LEVEL
RDS/SQ YD/MIN: TARGET LEVEL
LBS/SQ YD: TARGET LEVEL
LBS/SQ YD/MIN: TARGET LEVEL
LBS/SQ YD (EQ): TARGET LEVEL
LBS/SQ YD/MIN (EQ): TARGET LEVEL
    
```

PHASE

SERIAL:	10.00
TARGET NUMBER:	2
PHASE NUMBER:	6
TIME:	2305
----- TARGET DATA -----	
TARGET:	TARGET LEVEL
TARGET AREA:	TARGET LEVEL
PHASE TACTICS:	SUSTAINED FIRE
----- FIRING DATA -----	
FIRE UNIT:	3 FD REGT, 1 MO REGT, 1 HV BATT
TYPE WEAPONS:	A, F, H
NUMBER TUBES:	64A, 12F, 8H
TYPE AMMO:	??A, ??F, ??H
ROUNDS PER GUN:	15A, 8F, 4H
NUMBER ROUNDS:	960A, 96F, 32H
FIRE DURATION:	25
----- RESULTS DATA -----	
ATTACK DELAY TIME:	SERIAL LEVEL
TIME TO OBJECTIVE:	SERIAL LEVEL
CASUALTIES:	SERIAL LEVEL
EQUIPMENT DAMAGE:	SERIAL LEVEL
OTHER FACTORS:	SERIAL LEVEL
OTHER RESULTS:	SERIAL LEVEL
SUPPRESSION:	SERIAL LEVEL
----- CALCULATED DATA -----	
ROS/SQ YD:	TARGET LEVEL
ROS/SQ YD/MIN:	TARGET LEVEL
LBS/SQ YD:	TARGET LEVEL
LBS/SQ YD/MIN:	TARGET LEVEL
LBS/SQ YD (EQ):	TARGET LEVEL
LBS/SQ YD/MIN (EQ):	TARGET LEVEL

PHASE

SERIAL:	10.00
TARGET NUMBER:	2
PHASE NUMBER:	7
TIME:	2400
----- TARGET DATA -----	
TARGET:	TARGET LEVEL
TARGET AREA:	TARGET LEVEL
PHASE TACTICS:	SUSTAINED FIRE
----- FIRING DATA -----	
FIRE UNIT:	3 FD REGT, 1 MO BATT, 1 HV BATT
TYPE WEAPONS:	A, F, H
NUMBER TUBES:	64A, 12F, 8H
TYPE AMMO:	??A, ??F, ??H
ROUNDS PER GUN:	15A, 7F, 3.5H
NUMBER ROUNDS:	960A, 84F, 28H
FIRE DURATION:	25
----- RESULTS DATA -----	
ATTACK DELAY TIME:	SERIAL LEVEL
TIME TO OBJECTIVE:	SERIAL LEVEL
CASUALTIES:	SERIAL LEVEL
EQUIPMENT DAMAGE:	SERIAL LEVEL
OTHER FACTORS:	SERIAL LEVEL
OTHER RESULTS:	SERIAL LEVEL
SUPPRESSION:	SERIAL LEVEL
----- CALCULATED DATA -----	
ROS/SQ YD:	TARGET LEVEL
ROS/SQ YD/MIN:	TARGET LEVEL
LBS/SQ YD:	TARGET LEVEL
LBS/SQ YD/MIN:	TARGET LEVEL
LBS/SQ YD (EQ):	TARGET LEVEL
LBS/SQ YD/MIN (EQ):	TARGET LEVEL

## PHASE

SERIAL:	10.08
TARGET NUMBER:	2
PHASE NUMBER:	8
TIME:	0030
----- TARGET DATA -----	
TARGET:	TARGET LEVEL
TARGET AREA:	TARGET LEVEL
PHASE TACTICS:	CRASH
----- FIRING DATA -----	
FIRE UNIT:	3 FD REGT, 1 MD REGT, 1 HV BATT
TYPE WEAPONS:	A, F, H
NUMBER TUBES:	64A, 12F, 8H
TYPE AMMO:	??A, ??F, ??H
ROUNDS PER GUN:	5A, 3F, 1.5H
NUMBER ROUNDS:	320A, 36F, 12H
FIRE DURATION:	??
----- RESULTS DATA -----	
ATTACK DELAY TIME:	SERIAL LEVEL
TIME TO OBJECTIVE:	SERIAL LEVEL
CASUALTIES:	SERIAL LEVEL
EQUIPMENT DAMAGE:	SERIAL LEVEL
OTHER FACTORS:	SERIAL LEVEL
OTHER RESULTS:	SERIAL LEVEL
SUPPRESSION:	SERIAL LEVEL
----- CALCULATED DATA -----	
RDS/SQ YD:	TARGET LEVEL
RDS/SQ YD/MIN:	TARGET LEVEL
LBS/SQ YD:	TARGET LEVEL
LBS/SQ YD/MIN:	TARGET LEVEL
LBS/SQ YD (EQ):	TARGET LEVEL
LBS/SQ YD/MIN (EQ):	TARGET LEVEL

## PHASE

SERIAL:	10.08
TARGET NUMBER:	2
PHASE NUMBER:	9
TIME:	0035
----- TARGET DATA -----	
TARGET:	TARGET LEVEL
TARGET AREA:	TARGET LEVEL
PHASE TACTICS:	SUSTAINED FIRE
----- FIRING DATA -----	
FIRE UNIT:	3 FD REGT, 1 MD REGT, 1 HV BATT
TYPE WEAPONS:	A, F, H
NUMBER TUBES:	64A, 12F, 8H
TYPE AMMO:	??A, ??F, ??H
ROUNDS PER GUN:	40A, 20F, 10H
NUMBER ROUNDS:	2560A, 240F, 80H
FIRE DURATION:	85
----- RESULTS DATA -----	
ATTACK DELAY TIME:	SERIAL LEVEL
TIME TO OBJECTIVE:	SERIAL LEVEL
CASUALTIES:	SERIAL LEVEL
EQUIPMENT DAMAGE:	SERIAL LEVEL
OTHER FACTORS:	SERIAL LEVEL
OTHER RESULTS:	SERIAL LEVEL
SUPPRESSION:	SERIAL LEVEL
----- CALCULATED DATA -----	
RDS/SQ YD:	TARGET LEVEL
RDS/SQ YD/MIN:	TARGET LEVEL
LBS/SQ YD:	TARGET LEVEL
LBS/SQ YD/MIN:	TARGET LEVEL
LBS/SQ YD (EQ):	TARGET LEVEL
LBS/SQ YD/MIN (EQ):	TARGET LEVEL

# PHASE

SERIAL: 10.08  
TARGET NUMBER: 2  
PHASE NUMBER: 10  
TIME: 0200

----- TARGET DATA -----  
TARGET: TARGET LEVEL

TARGET AREA: TARGET LEVEL  
PHASE TACTICS: SUSTAINED FIRE

----- FIRING DATA -----  
FIRE UNIT: 3 FD REGT, 1 MO REGT, 1 MV BATT  
TYPE WEAPONS: A, F, H  
NUMBER TUBES: 64A, 12F, 8H  
TYPE AMMO: ??A, ??F, ??H  
ROUNDS PER GUN: 30A, 15F, 7.5H  
NUMBER ROUNDS: 1920A, 180F, 60H  
FIRE DURATION: 240

----- RESULTS DATA -----  
ATTACK DELAY TIME: SERIAL LEVEL  
TIME TO OBJECTIVE: SERIAL LEVEL  
CASUALTIES: SERIAL LEVEL  
EQUIPMENT DAMAGE: SERIAL LEVEL  
OTHER FACTORS: SERIAL LEVEL

OTHER RESULTS: SERIAL LEVEL  
SUPPRESSION: SERIAL LEVEL

----- CALCULATED DATA -----  
RDS/SQ YD: TARGET LEVEL  
RDS/SQ YD/MIN: TARGET LEVEL  
LBS/SQ YD: TARGET LEVEL  
LBS/SQ YD/MIN: TARGET LEVEL  
LBS/SQ YD (EQ): TARGET LEVEL  
LBS/SQ YD/MIN (EQ): TARGET LEVEL



## SERIAL

SERIAL:	10.09
REF NUMBER:	A9
ORIG REF:	LORS 1/24 PART II
REF TITLE:	THE EFFECTIVENESS OF ARTILLERY IN ITALY, 1944
DATA SOURCE:	ACTION REPORT NUMBER 9
----- SERIAL DATA -----	
SIDE 1 COUNTRY:	BRITAIN
SIDE 1 UNITS:	1 ARTY TROOP
SIDE 1 POSTURE:	DEFENDING
SIDE 2 COUNTRY:	GERMANY
SIDE 2 UNITS:	??
SIDE 2 POSTURE:	ATTACKING
DATE OF ACTION:	2-7 OCT 1944
COUNTRY:	ITALY
REGION:	??
TERRAIN:	??
WEATHER:	??
TIME:	??
SERIAL TACTICS:	COUNTERBATTERY FIRE AT APPROX 30 MINUTE INTERVALS FOR 5 DAYS
NO. BMBRD TARGETS:	1
NO. PHASES/TGT:	1
----- TARGET DATA -----	
BOMBARD TARGET:	PHASE LEVEL
BOMBARD TGT AREA:	PHASE LEVEL
BOMBARD TACTICS:	TARGET LEVEL
----- FIRING DATA -----	
FIRE UNIT:	PHASE LEVEL
TYPE WEAPONS:	PHASE LEVEL
NUMBER TUBES:	PHASE LEVEL
TYPE AMMO:	PHASE LEVEL
ROUNDS PER GUN:	PHASE LEVEL
NUMBER ROUNDS:	PHASE LEVEL
FIRE DURATION:	TARGET LEVEL AND PHASE LEVEL
----- RESULTS DATA -----	
ATTACK DELAY TIME:	N/A
TIME TO OBJECTIVE:	N/A
CASUALTIES:	?? (GERMAN); 1 KIA, 3 WIA (BRITISH)
EQUIPMENT DAMAGE:	?? (GERMAN); 4 TRK DAMAGED, 1 GUN DAMAGED (BRITISH)
OTHER FACTORS:	NONE
OTHER RESULTS:	??
SUPPRESSION:	MORALE WAS HIGH AND UNAFFECTED BY SHELLING
----- CALCULATED DATA -----	
RDS/SQ YD:	PHASE LEVEL
RDS/SQ YD/MIN:	PHASE LEVEL
LBS/SQ YD:	PHASE LEVEL
LBS/SQ YD/MIN:	PHASE LEVEL
LBS/SQ YD (EQ):	PHASE LEVEL
LBS/SQ YD/MIN (EQ):	PHASE LEVEL

## TARGET

SERIAL:	10.09
TARGET NUMBER:	1
NUMBER PHASES:	1
TIME:	??
----- TARGET DATA -----	
TARGET:	PHASE LEVEL
TARGET AREA:	PHASE LEVEL
TARGET TACTICS:	COUNTERBATTERY FIRE AT APPROX 30 MINUTE INTERVALS
----- FIRING DATA -----	
FIRE UNIT:	PHASE LEVEL
TYPE WEAPONS:	PHASE LEVEL
NUMBER TUBES:	PHASE LEVEL
TYPE AMMO:	PHASE LEVEL
ROUNDS PER GUN:	PHASE LEVEL
NUMBER ROUNDS:	PHASE LEVEL
FIRE DURATION:	7200
----- RESULTS DATA -----	
ATTACK DELAY TIME:	SERIAL LEVEL
TIME TO OBJECTIVE:	SERIAL LEVEL
CASUALTIES:	SERIAL LEVEL
EQUIPMENT DAMAGE:	SERIAL LEVEL
OTHER FACTORS:	SERIAL LEVEL
OTHER RESULTS:	SERIAL LEVEL
SUPPRESSION:	SERIAL LEVEL
----- CALCULATED DATA -----	
RDS/SQ YD:	PHASE LEVEL
RDS/SQ YD/MIN:	PHASE LEVEL
LBS/SQ YD:	PHASE LEVEL
LBS/SQ YD/MIN:	PHASE LEVEL
LBS/SQ YD (EQ):	PHASE LEVEL
LBS/SQ YD/MIN (EQ):	PHASE LEVEL

## PHASE

SERIAL:	10.09
TARGET NUMBER:	1
PHASE NUMBER:	1
TIME:	??
----- TARGET DATA -----	
TARGET:	BRITISH ARTY TROOP WITH GUNS IN EMPLACEMENTS AND CP IN HOUSE
TARGET AREA:	17500
PHASE TACTICS:	??
----- FIRING DATA -----	
FIRE UNIT:	??
TYPE WEAPONS:	J OR FF
NUMBER TUBES:	??
TYPE AMMO:	??
ROUNDS PER GUN:	??
NUMBER ROUNDS:	100 TO 150
FIRE DURATION:	7200
----- RESULTS DATA -----	
ATTACK DELAY TIME:	SERIAL LEVEL
TIME TO OBJECTIVE:	SERIAL LEVEL
CASUALTIES:	SERIAL LEVEL
EQUIPMENT DAMAGE:	SERIAL LEVEL
OTHER FACTORS:	SERIAL LEVEL
OTHER RESULTS:	SERIAL LEVEL
SUPPRESSION:	SERIAL LEVEL
----- CALCULATED DATA -----	
RDS/SQ YD:	0.00429J
RDS/SQ YD/MIN:	??J
LBS/SQ YD:	0.142J
LBS/SQ YD/MIN:	??J
LBS/SQ YD (EQ):	0.130J
LBS/SQ YD/MIN (EQ):	??J

## SERIAL

SERIAL: 10.10  
 REF NUMBER: A9  
 ORIG REF: IORS 1/24 PART I:  
 REF TITLE: THE EFFECTIVENESS OF ARTILLERY IN ITALY, 1944  
 DATA SOURCE: ACTION REPORT NUMBER 10

----- SERIAL DATA -----

SIDE 1 COUNTRY: BRITAIN  
 SIDE 1 UNITS: 1 ARTY TROOP  
 SIDE 1 POSTURE: DEFENDING  
 SIDE 2 COUNTRY: GERMANY  
 SIDE 2 UNITS: ??  
 SIDE 2 POSTURE: ATTACKING

DATE OF ACTION: ??  
 COUNTRY: ITALY  
 REGION: ??  
 TERRAIN: ??  
 WEATHER: ??  
 TIME: ??

SERIAL TACTICS: PERIODIC SHELLING FOR UNSPECIFIED PERIOD OVER SEVERAL DAYS

NO. BMBRD TARGETS: ??  
 NO. PHASES/TGT: ??

----- TARGET DATA -----

BOMBARD TARGET: BRITISH ARTY TROOP  
 BOMBARD TGT AREA: ??  
 BOMBARD TACTICS: PERIODIC SHELLING

----- FIRING DATA -----

FIRE UNIT: ??  
 TYPE WEAPONS: J OR FF  
 NUMBER TUBES: ??  
 TYPE AMMO: ??  
 ROUNDS PER GUN: ??  
 NUMBER ROUNDS: ABOUT 70 ROUNDS  
 FIRE DURATION: SEVERAL DAYS

----- RESULTS DATA -----

ATTACK DELAY TIME: N/A  
 TIME TO OBJECTIVE: N/A  
 CASUALTIES: ?? (GERMAN); 7 WIA (BRITISH)  
 EQUIPMENT DAMAGE: ?? (GERMAN); 1 GUN DAM, 5 AMMO LORRIES DEST (BRITISH)  
 OTHER FACTORS: NONE

OTHER RESULTS: ??  
 SUPPRESSION: ??

----- CALCULATED DATA -----

RDS/SQ YD: ??  
 RDS/SQ YD/MIN: ??  
 LBS/SQ YD: ??  
 LBS/SQ YD/MIN: ??  
 LBS/SQ YD (EQ): ??  
 LBS/SQ YD/MIN (EQ): ??



SERIAL

SERIAL: 11  
 REF NUMBER: A11  
 ORIG REF: IORS 1/30  
 REF TITLE: PREL BMBRD ON NZ FRONT DURING 8TH ARMY ATK ACROSS R SENIO  
 DATA SOURCE: ACTION REPORTS, GROUND SURVEY, POW

----- SERIAL DATA -----

SIDE 1 COUNTRY: NEW ZEAL  
 SIDE 1 UNITS: 2 DIV  
 SIDE 1 POSTURE: ATTACKING  
 SIDE 2 COUNTRY: GERMANY  
 SIDE 2 UNITS: 2 REGT  
 SIDE 2 POSTURE: DEFENDING

DATE OF ACTION: 04/09/45  
 COUNTRY: ITALY  
 REGION: RIVER SENIO  
 TERRAIN: FLAT  
 WEATHER: ??  
 TIME: 1350

SERIAL TACTICS: 2 NZ DIVISION WAS TO ATTACK WITH FLAMETHROWERS AFTER PRELIMINARY BOM  
 BARDMENT

NO. BMBRD TARGETS: 2  
 NO. PHASES/TGT: 1/9

----- TARGET DATA -----

BOMBARD TARGET: PHASE LEVEL/TARGET LEVEL

BOMBARD TGT AREA: PHASE LEVEL/TARGET LEVEL  
 BOMBARD TACTICS: TARGET LEVEL

----- FIRING DATA -----

FIRE UNIT: PHASE LEVEL  
 TYPE WEAPONS: PHASE LEVEL  
 NUMBER TUBES: PHASE LEVEL  
 TYPE AMMO: PHASE LEVEL  
 ROUNDS PER GUN: PHASE LEVEL  
 NUMBER ROUNDS: PHASE LEVEL  
 FIRE DURATION: TARGET LEVEL AND PHASE LEVEL

----- RESULTS DATA -----

ATTACK DELAY TIME: NO DELAY  
 TIME TO OBJECTIVE: ??  
 CASUALTIES: 17 WIA, 239 POW (GERMAN); 25 WIA (NZ)  
 EQUIPMENT DAMAGE: ??; ??  
 OTHER FACTORS: GERMAN MORALE WAS POOR; USE OF FLAMETHROWERS IS TO BE NOTED; DUMMY AIR  
 ATTACK ACHIEVED SURPRISE  
 OTHER RESULTS: RESISTANCE WAS NEGLIGIBLE  
 SUPPRESSION: GERMANS WERE NEUTRALIZED

----- CALCULATED DATA -----

RDS/SQ YD: PHASE LEVEL/TARGET LEVEL  
 RDS/SQ YD/MIN: PHASE LEVEL/TARGET LEVEL  
 LBS/SQ YD: PHASE LEVEL/TARGET LEVEL  
 LBS/SQ YD/MIN: PHASE LEVEL/TARGET LEVEL  
 LBS/SQ YD (EQ): PHASE LEVEL/TARGET LEVEL  
 LBS/SQ YD/MIN (EQ): PHASE LEVEL/TARGET LEVEL

## TARGET

SERIAL: 11  
TARGET NUMBER: 1  
NUMBER PHASES: 1  
TIME: 1350  
----- TARGET DATA -----  
TARGET: PHASE LEVEL  
  
TARGET AREA: PHASE LEVEL  
TARGET TACTICS: CARPET BOMBING OF GERMAN REAR AREAS  
  
----- FIRING DATA -----  
FIRE UNIT: PHASE LEVEL  
TYPE WEAPONS: PHASE LEVEL  
NUMBER TUBES: PHASE LEVEL  
TYPE AMMO: PHASE LEVEL  
ROUNDS PER GUN: PHASE LEVEL  
NUMBER ROUNDS: PHASE LEVEL  
FIRE DURATION: 120  
  
----- RESULTS DATA -----  
ATTACK DELAY TIME: SERIAL LEVEL  
TIME TO OBJECTIVE: SERIAL LEVEL  
CASUALTIES: SERIAL LEVEL  
EQUIPMENT DAMAGE: SERIAL LEVEL  
OTHER FACTORS: SERIAL LEVEL  
  
OTHER RESULTS: SERIAL LEVEL  
SUPPRESSION: SERIAL LEVEL  
  
----- CALCULATED DATA -----  
RDS/SQ YD: PHASE LEVEL  
RDS/SQ YD/MIN: PHASE LEVEL  
LBS/SQ YD: PHASE LEVEL  
LBS/SQ YD/MIN: PHASE LEVEL  
LBS/SQ YD (EQ): PHASE LEVEL  
LBS/SQ YD/MIN (EQ): PHASE LEVEL

## PHASE

SERIAL: 11  
TARGET NUMBER: 1  
PHASE NUMBER: 1  
TIME: 1350  
----- TARGET DATA -----  
TARGET: GERMAN REAR AREAS  
  
TARGET AREA: ??  
PHASE TACTICS: CARPET BOMBING  
  
----- FIRING DATA -----  
FIRE UNIT: ??  
TYPE WEAPONS: T  
NUMBER TUBES: ???  
TYPE AMMO: ???  
ROUNDS PER GUN: ???  
NUMBER ROUNDS: ???  
FIRE DURATION: 120  
  
----- RESULTS DATA -----  
ATTACK DELAY TIME: SERIAL LEVEL  
TIME TO OBJECTIVE: SERIAL LEVEL  
CASUALTIES: SERIAL LEVEL  
EQUIPMENT DAMAGE: SERIAL LEVEL  
OTHER FACTORS: SERIAL LEVEL  
  
OTHER RESULTS: SERIAL LEVEL  
SUPPRESSION: SERIAL LEVEL  
  
----- CALCULATED DATA -----  
RDS/SQ YD: ???  
RDS/SQ YD/MIN: ???  
LBS/SQ YD: ???  
LBS/SQ YD/MIN: ???  
LBS/SQ YD (EQ): ???  
LBS/SQ YD/MIN (EQ): ???

## TARGET

SERIAL: 11  
TARGET NUMBER: 2  
NUMBER PHASES: 9  
TIME: 1520

----- TARGET DATA -----  
TARGET: DUG-IN SHELTERS AND WEAPON PITS

TARGET AREA: 2883000  
TARGET TACTICS: ALTERNATE GROUND ARTY WITH FIGHTEN BOMBER ATTACKS

----- FIRING DATA -----  
FIRE UNIT: PHASE LEVEL  
TYPE WEAPONS: PHASE LEVEL  
NUMBER TUBES: PHASE LEVEL  
TYPE AMMO: PHASE LEVEL  
ROUNDS PER GUN: PHASE LEVEL  
NUMBER ROUNDS: PHASE LEVEL  
FIRE DURATION: 230

----- RESULTS DATA -----  
ATTACK DELAY TIME: SERIAL LEVEL  
TIME TO OBJECTIVE: SERIAL LEVEL  
CASUALTIES: SERIAL LEVEL  
EQUIPMENT DAMAGE: SERIAL LEVEL  
OTHER FACTORS: SERIAL LEVEL

OTHER RESULTS: SERIAL LEVEL  
SUPPRESSION: SERIAL LEVEL

----- CALCULATED DATA -----  
RDS/SQ YD: ???  
RDS/SQ YD/MIN: ???  
LBS/SQ YD: 0.516Y  
LBS/SQ YD/MIN: ???  
LBS/SQ YD (EQ): ???  
LBS/SQ YD/MIN (EQ): ???

## PHASE

SERIAL: 11  
TARGET NUMBER: 2  
PHASE NUMBER: 1  
TIME: 1520

----- TARGET DATA -----  
TARGET: TARGET LEVEL

TARGET AREA: TARGET LEVEL  
PHASE TACTICS: ??

----- FIRING DATA -----  
FIRE UNIT: 2 DIV  
TYPE WEAPONS: Y  
NUMBER TUBES: ???  
TYPE AMMO: ???  
ROUNDS PER GUN: ???  
NUMBER ROUNDS: ???  
FIRE DURATION: 30

----- RESULTS DATA -----  
ATTACK DELAY TIME: SERIAL LEVEL  
TIME TO OBJECTIVE: SERIAL LEVEL  
CASUALTIES: SERIAL LEVEL  
EQUIPMENT DAMAGE: SERIAL LEVEL  
OTHER FACTORS: SERIAL LEVEL

OTHER RESULTS: SERIAL LEVEL  
SUPPRESSION: SERIAL LEVEL

----- CALCULATED DATA -----  
RDS/SQ YD: TARGET LEVEL  
RDS/SQ YD/MIN: TARGET LEVEL  
LBS/SQ YD: TARGET LEVEL  
LBS/SQ YD/MIN: TARGET LEVEL  
LBS/SQ YD (EQ): TARGET LEVEL  
LBS/SQ YD/MIN (EQ): TARGET LEVEL

## PHASE

SERIAL: 11  
TARGET NUMBER: 2  
PHASE NUMBER: 2  
TIME: 1550  
----- TARGET DATA -----  
TARGET: TARGET LEVEL  
  
TARGET AREA: TARGET LEVEL  
PHASE TACTICS: ??  
----- FIRING DATA -----  
FIRE UNIT: ??  
TYPE WEAPONS: T  
NUMBER TUBES: ??T  
TYPE AMMO: ??T  
ROUNDS PER GUN: ??T  
NUMBER ROUNDS: ??T  
FIRE DURATION: 20  
----- RESULTS DATA -----  
ATTACK DELAY TIME: SERIAL LEVEL  
TIME TO OBJECTIVE: SERIAL LEVEL  
CASUALTIES: SERIAL LEVEL  
EQUIPMENT DAMAGE: SERIAL LEVEL  
OTHER FACTORS: SERIAL LEVEL  
  
OTHER RESULTS: SERIAL LEVEL  
SUPPRESSION: SERIAL LEVEL  
  
----- CALCULATED DATA -----  
RDS/SQ YD: TARGET LEVEL  
RDS/SQ YD/MIN: TARGET LEVEL  
LBS/SQ YD: TARGET LEVEL  
LBS/SQ YD/MIN: TARGET LEVEL  
LBS/SQ YD (EQ): TARGET LEVEL  
LBS/SQ YD/MIN (EQ): TARGET LEVEL

## PHASE

SERIAL: 11  
TARGET NUMBER: 2  
PHASE NUMBER: 3  
TIME: 1610  
----- TARGET DATA -----  
TARGET: TARGET LEVEL  
  
TARGET AREA: TARGET LEVEL  
PHASE TACTICS: ??  
----- FIRING DATA -----  
FIRE UNIT: 2 DIV  
TYPE WEAPONS: Y  
NUMBER TUBES: ??Y  
TYPE AMMO: ??Y  
ROUNDS PER GUN: ??Y  
NUMBER ROUNDS: ??Y  
FIRE DURATION: 30  
----- RESULTS DATA -----  
ATTACK DELAY TIME: SERIAL LEVEL  
TIME TO OBJECTIVE: SERIAL LEVEL  
CASUALTIES: SERIAL LEVEL  
EQUIPMENT DAMAGE: SERIAL LEVEL  
OTHER FACTORS: SERIAL LEVEL  
  
OTHER RESULTS: SERIAL LEVEL  
SUPPRESSION: SERIAL LEVEL  
  
----- CALCULATED DATA -----  
RDS/SQ YD: TARGET LEVEL  
RDS/SQ YD/MIN: TARGET LEVEL  
LBS/SQ YD: TARGET LEVEL  
LBS/SQ YD/MIN: TARGET LEVEL  
LBS/SQ YD (EQ): TARGET LEVEL  
LBS/SQ YD/MIN (EQ): TARGET LEVEL

## PHASE

SERIAL:	11
TARGET NUMBER:	2
PHASE NUMBER:	4
TIME:	1640
----- TARGET DATA -----	
TARGET:	TARGET LEVEL
TARGET AREA:	TARGET LEVEL
PHASE TACTICS:	??
----- FIRING DATA -----	
FIRE UNIT:	??
TYPE WEAPONS:	T
NUMBER TUBES:	??T
TYPE AMMO:	??T
ROUNDS PER GUN:	??T
NUMBER ROUNDS:	??T
FIRE DURATION:	20
----- RESULTS DATA -----	
ATTACK DELAY TIME:	SERIAL LEVEL
TIME TO OBJECTIVE:	SERIAL LEVEL
CASUALTIES:	SERIAL LEVEL
EQUIPMENT DAMAGE:	SERIAL LEVEL
OTHER FACTORS:	SERIAL LEVEL
OTHER RESULTS:	SERIAL LEVEL
SUPPRESSION:	SERIAL LEVEL
----- CALCULATED DATA -----	
RDS/SQ YD:	TARGET LEVEL
RDS/SQ YD/MIN:	TARGET LEVEL
LBS/SQ YD:	TARGET LEVEL
LBS/SQ YD/MIN:	TARGET LEVEL
LBS/SQ YD (EQ):	TARGET LEVEL
LBS/SQ YD/MIN (EQ):	TARGET LEVEL

## PHASE

SERIAL:	11
TARGET NUMBER:	2
PHASE NUMBER:	5
TIME:	1700
----- TARGET DATA -----	
TARGET:	TARGET LEVEL
TARGET AREA:	TARGET LEVEL
PHASE TACTICS:	??
----- FIRING DATA -----	
FIRE UNIT:	2 DIV
TYPE WEAPONS:	Y
NUMBER TUBES:	??Y
TYPE AMMO:	??Y
ROUNDS PER GUN:	??Y
NUMBER ROUNDS:	??Y
FIRE DURATION:	30
----- RESULTS DATA -----	
ATTACK DELAY TIME:	SERIAL LEVEL
TIME TO OBJECTIVE:	SERIAL LEVEL
CASUALTIES:	SERIAL LEVEL
EQUIPMENT DAMAGE:	SERIAL LEVEL
OTHER FACTORS:	SERIAL LEVEL
OTHER RESULTS:	SERIAL LEVEL
SUPPRESSION:	SERIAL LEVEL
----- CALCULATED DATA -----	
RDS/SQ YD:	TARGET LEVEL
RDS/SQ YD/MIN:	TARGET LEVEL
LBS/SQ YD:	TARGET LEVEL
LBS/SQ YD/MIN:	TARGET LEVEL
LBS/SQ YD (EQ):	TARGET LEVEL
LBS/SQ YD/MIN (EQ):	TARGET LEVEL

## PHASE

```

SERIAL: 11
TARGET NUMBER: 2
PHASE NUMBER: 6
TIME: 1730
----- TARGET DATA -----
TARGET: TARGET LEVEL

TARGET AREA: TARGET LEVEL
PHASE TACTICS: ??

----- FIRING DATA -----
FIRE UNIT: ??
TYPE WEAPONS: T
NUMBER TUBES: ??T
TYPE AMMO: ??T
ROUNDS PER GUN: ??T
NUMBER ROUNDS: ??T
FIRE DURATION: 20

----- RESULTS DATA -----
ATTACK DELAY TIME: SERIAL LEVEL
TIME TO OBJECTIVE: SERIAL LEVEL
CASUALTIES: SERIAL LEVEL
EQUIPMENT DAMAGE: SERIAL LEVEL
OTHER FACTORS: SERIAL LEVEL

OTHER RESULTS: SERIAL LEVEL
SUPPRESSION: SERIAL LEVEL

----- CALCULATED DATA -----
RDS/SQ YD: TARGET LEVEL
RDS/SQ YD/MIN: TARGET LEVEL
LBS/SQ YD: TARGET LEVEL
LBS/SQ YD/MIN: TARGET LEVEL
LBS/SQ YD (EQ): TARGET LEVEL
LBS/SQ YD/MIN (EQ): TARGET LEVEL
    
```

## PHASE

```

SERIAL: 11
TARGET NUMBER: 2
PHASE NUMBER: 7
TIME: 1750
----- TARGET DATA -----
TARGET: TARGET LEVEL

TARGET AREA: TARGET LEVEL
PHASE TACTICS: ??

----- FIRING DATA -----
FIRE UNIT: 2 DIV
TYPE WEAPONS: Y
NUMBER TUBES: ??Y
TYPE AMMO: ??Y
ROUNDS PER GUN: ??Y
NUMBER ROUNDS: ??Y
FIRE DURATION: 30

----- RESULTS DATA -----
ATTACK DELAY TIME: SERIAL LEVEL
TIME TO OBJECTIVE: SERIAL LEVEL
CASUALTIES: SERIAL LEVEL
EQUIPMENT DAMAGE: SERIAL LEVEL
OTHER FACTORS: SERIAL LEVEL

OTHER RESULTS: SERIAL LEVEL
SUPPRESSION: SERIAL LEVEL

----- CALCULATED DATA -----
RDS/SQ YD: TARGET LEVEL
RDS/SQ YD/MIN: TARGET LEVEL
LBS/SQ YD: TARGET LEVEL
LBS/SQ YD/MIN: TARGET LEVEL
LBS/SQ YD (EQ): TARGET LEVEL
LBS/SQ YD/MIN (EQ): TARGET LEVEL
    
```

## PHASE

SERIAL:	11
TARGET NUMBER:	2
PHASE NUMBER:	8
TIME:	1820
----- TARGET DATA -----	
TARGET:	TARGET LEVEL
TARGET AREA:	TARGET LEVEL
PHASE TACTICS:	??
----- FIRING DATA -----	
FIRE UNIT:	??
TYPE WEAPONS:	T
NUMBER TUBES:	??T
TYPE AMMO:	??T
ROUNDS PER GUN:	??T
NUMBER ROUNDS:	??T
FIRE DURATION:	20
----- RESULTS DATA -----	
ATTACK DELAY TIME:	SERIAL LEVEL
TIME TO OBJECTIVE:	SERIAL LEVEL
CASUALTIES:	SERIAL LEVEL
EQUIPMENT DAMAGE:	SERIAL LEVEL
OTHER FACTORS:	SERIAL LEVEL
OTHER RESULTS:	SERIAL LEVEL
SUPPRESSION:	SERIAL LEVEL
----- CALCULATED DATA -----	
RDS/SQ YD:	TARGET LEVEL
RDS/SQ YD/MIN:	TARGET LEVEL
LBS/SQ YD:	TARGET LEVEL
LBS/SQ YD/MIN:	TARGET LEVEL
LBS/SQ YD (EQ):	TARGET LEVEL
LBS/SQ YD/MIN (EQ):	TARGET LEVEL

## PHASE

SERIAL:	11
TARGET NUMBER:	2
PHASE NUMBER:	9
TIME:	1840
----- TARGET DATA -----	
TARGET:	TARGET LEVEL
TARGET AREA:	TARGET LEVEL
PHASE TACTICS:	??
----- FIRING DATA -----	
FIRE UNIT:	2 DIV
TYPE WEAPONS:	Y
NUMBER TUBES:	??Y
TYPE AMMO:	??Y
ROUNDS PER GUN:	??Y
NUMBER ROUNDS:	??Y
FIRE DURATION:	30
----- RESULTS DATA -----	
ATTACK DELAY TIME:	SERIAL LEVEL
TIME TO OBJECTIVE:	SERIAL LEVEL
CASUALTIES:	SERIAL LEVEL
EQUIPMENT DAMAGE:	SERIAL LEVEL
OTHER FACTORS:	SERIAL LEVEL
OTHER RESULTS:	SERIAL LEVEL
SUPPRESSION:	SERIAL LEVEL
----- CALCULATED DATA -----	
RDS/SQ YD:	TARGET LEVEL
RDS/SQ YD/MIN:	TARGET LEVEL
LBS/SQ YD:	TARGET LEVEL
LBS/SQ YD/MIN:	TARGET LEVEL
LBS/SQ YD (EQ):	TARGET LEVEL
LBS/SQ YD/MIN (EQ):	TARGET LEVEL



## SERIAL

SERIAL: 12  
REF NUMBER: A1  
ORIG REF: AORG 410  
REF TITLE: EFFECT OF BOMBARDMENT, 13 INF BDE ATTACK 0530 18 JAN 44  
DATA SOURCE: WAR DIARIES

### SERIAL DATA

SIDE 1 COUNTRY: BRITAIN  
SIDE 1 UNITS: 2 BDE, 2 FD RGT, 2 MD RGT, 1 HV RGT  
SIDE 1 POSTURE: ATTACKING  
SIDE 2 COUNTRY: GERMANY  
SIDE 2 UNITS: 1 RECCE UNIT, 1 INF REGT  
SIDE 2 POSTURE: DEFENDING

DATE OF ACTION: 01/18/44  
COUNTRY: ITALY  
REGION: SESSA AURUNCA  
TERRAIN: RIVER  
WEATHER: ??  
TIME: 0530

SERIAL TACTICS: ADVANCE ACROSS A RIVER AND CAPTURE SEVERAL OBJECTIVES

NO. BMBRD TARGETS: 2  
NO. PHASES/TGT: 5/4

### TARGET DATA

BOMBARD TARGET: TARGET LEVEL

BOMBARD TGT AREA: TARGET LEVEL  
BOMBARD TACTICS: TARGET LEVEL

### FIRING DATA

FIRE UNIT: PHASE LEVEL  
TYPE WEAPONS: PHASE LEVEL  
NUMBER TUBES: PHASE LEVEL  
TYPE AMMO: PHASE LEVEL  
ROUNDS PER GUN: PHASE LEVEL  
NUMBER ROUNDS: PHASE LEVEL  
FIRE DURATION: TARGET LEVEL AND PHASE LEVEL

### RESULTS DATA

ATTACK DELAY TIME: ??  
TIME TO OBJECTIVE: ??  
CASUALTIES: 9 KIA, 10 WIA, 64 POW (GERMAN); 200 CASUALTIES (BRITISH)  
EQUIPMENT DAMAGE: ??; ??  
OTHER FACTORS: BRITISH HAD TO CROSS RIVER; BRITISH BOATS WERE LOST; 194 RECCE HAD BEE N IN ANOTHER BATTLE THAT NIGHT  
OTHER RESULTS: BRITISH OVER-RAN GERMAN POSITIONS; ATTACK WAS A SUCCESS  
SUPPRESSION: NO SUPPRESSION OR NEUTRALIZATION

### CALCULATED DATA

RDS/SQ YD: TARGET LEVEL  
RDS/SQ YD/MIN: TARGET LEVEL  
LBS/SQ YD: TARGET LEVEL  
LBS/SQ YD/MIN: TARGET LEVEL  
LBS/SQ YD (EQ): TARGET LEVEL  
LBS/SQ YD/MIN (EQ): TARGET LEVEL

## TARGET

```

SERIAL: 12
TARGET NUMBER: 1
NUMBER PHASES: 5
TIME: 0530
----- TARGET DATA -----
TARGET: GERMAN POSITION

TARGET AREA: 6250000
TARGET TACTICS: BOMBARD GERMAN POSITION

----- FIRING DATA -----
FIRE UNIT: PHASE LEVEL
TYPE WEAPONS: PHASE LEVEL
NUMBER TUBES: PHASE LEVEL
TYPE AMMO: PHASE LEVEL
ROUNDS PER GUN: PHASE LEVEL
NUMBER ROUNDS: PHASE LEVEL
FIRE DURATION: 115

----- RESULTS DATA -----
ATTACK DELAY TIME: SERIAL LEVEL
TIME TO OBJECTIVE: SERIAL LEVEL
CASUALTIES: SERIAL LEVEL
EQUIPMENT DAMAGE: SERIAL LEVEL
OTHER FACTORS: SERIAL LEVEL

OTHER RESULTS: SERIAL LEVEL
SUPPRESSION: SERIAL LEVEL

----- CALCULATED DATA -----
RDS/SQ YD: 0.00242A,0.0002E,0.000135F,0.00003H
RDS/SQ YD/MIN: ??A,??E,??F,??H
LBS/SQ YD: 0.0605A,0.001103E,0.0108F,0.006H
LBS/SQ YD/MIN: ??A,??E,??F,??H
LBS/SQ YD (EQ): 0.0605A,0.00802E,0.00898F,0.00291H
LBS/SQ YD/MIN (EQ): ??A,??E,??F,??H
    
```

## PHASE

```

SERIAL: 12
TARGET NUMBER: 1
PHASE NUMBER: 1
TIME: 0530
----- TARGET DATA -----
TARGET: TARGET LEVEL

TARGET AREA: TARGET LEVEL
PHASE TACTICS: CONCENTRATION

----- FIRING DATA -----
FIRE UNIT: 2 FD REGT
TYPE WEAPONS: A,E,F
NUMBER TUBES: 48A,16E,8F
TYPE AMMO: ??A,??E,??F
ROUNDS PER GUN: 60A,26.7E,26.8F
NUMBER ROUNDS: 2880A,426.7E,213F
FIRE DURATION: 20

----- RESULTS DATA -----
ATTACK DELAY TIME: SERIAL LEVEL
TIME TO OBJECTIVE: SERIAL LEVEL
CASUALTIES: SERIAL LEVEL
EQUIPMENT DAMAGE: SERIAL LEVEL
OTHER FACTORS: SERIAL LEVEL

OTHER RESULTS: SERIAL LEVEL
SUPPRESSION: SERIAL LEVEL

----- CALCULATED DATA -----
RDS/SQ YD: TARGET LEVEL
RDS/SQ YD/MIN: TARGET LEVEL
LBS/SQ YD: TARGET LEVEL
LBS/SQ YD/MIN: TARGET LEVEL
LBS/SQ YD (EQ): TARGET LEVEL
LBS/SQ YD/MIN (EQ): TARGET LEVEL
    
```

## PHASE

SERIAL:	12
TARGET NUMBER:	1
PHASE NUMBER:	2
TIME:	0550
----- TARGET DATA -----	
TARGET:	TARGET LEVEL
TARGET AREA:	TARGET LEVEL
PHASE TACTICS:	CONCENTRATION
----- FIRING DATA -----	
FIRE UNIT:	2 BATT
TYPE WEAPONS:	A, E, F, H
NUMBER TUBES:	48A, 16E, 8F, 16H
TYPE AMMO:	??A, ??E, ??F, ??H
ROUNDS PER GUN:	80A, 13.3E, 13.4F, 3.3H
NUMBER ROUNDS:	2880A, 213.3E, 107F, 53.3H
FIRE DURATION:	20
----- RESULTS DATA -----	
ATTACK DELAY TIME:	SERIAL LEVEL
TIME TO OBJECTIVE:	SERIAL LEVEL
CASUALTIES:	SERIAL LEVEL
EQUIPMENT DAMAGE:	SERIAL LEVEL
OTHER FACTORS:	SERIAL LEVEL
OTHER RESULTS:	SERIAL LEVEL
SUPPRESSION:	SERIAL LEVEL
----- CALCULATED DATA -----	
RDS/SQ YD:	TARGET LEVEL
RDS/SQ YD/MIN:	TARGET LEVEL
LBS/SQ YD:	TARGET LEVEL
LBS/SQ YD/MIN:	TARGET LEVEL
LBS/SQ YD (EQ):	TARGET LEVEL
LBS/SQ YD/MIN (EQ):	TARGET LEVEL

## PHASE

SERIAL:	12
TARGET NUMBER:	1
PHASE NUMBER:	3
TIME:	0610
----- TARGET DATA -----	
TARGET:	TARGET LEVEL
TARGET AREA:	TARGET LEVEL
PHASE TACTICS:	CONCENTRATION
----- FIRING DATA -----	
FIRE UNIT:	1 MO REGT
TYPE WEAPONS:	E, H
NUMBER TUBES:	16E, 16H
TYPE AMMO:	??E, ??H
ROUNDS PER GUN:	23.3E, 5.8H
NUMBER ROUNDS:	373.3E, 93.3H
FIRE DURATION:	35
----- RESULTS DATA -----	
ATTACK DELAY TIME:	SERIAL LEVEL
TIME TO OBJECTIVE:	SERIAL LEVEL
CASUALTIES:	SERIAL LEVEL
EQUIPMENT DAMAGE:	SERIAL LEVEL
OTHER FACTORS:	SERIAL LEVEL
OTHER RESULTS:	SERIAL LEVEL
SUPPRESSION:	SERIAL LEVEL
----- CALCULATED DATA -----	
RDS/SQ YD:	TARGET LEVEL
RDS/SQ YD/MIN:	TARGET LEVEL
LBS/SQ YD:	TARGET LEVEL
LBS/SQ YD/MIN:	TARGET LEVEL
LBS/SQ YD (EQ):	TARGET LEVEL
LBS/SQ YD/MIN (EQ):	TARGET LEVEL

## PHASE

SERIAL:	12
TARGET NUMBER:	1
PHASE NUMBER:	4
TIME:	0645
----- TARGET DATA -----	
TARGET:	TARGET LEVEL
TARGET AREA:	TARGET LEVEL
PHASE TACTICS:	CONCENTRATION
----- FIRING DATA -----	
FIRE UNIT:	1 MD REGT
TYPE WEAPONS:	E, H
NUMBER TUBES:	16E, 16H
TYPE AMMO:	??E, ??H
ROUNDS PER GUN:	16.7E, 4.2H
NUMBER ROUNDS:	266.7E, 66.7H
FIRE DURATION:	25
----- RESULTS DATA -----	
ATTACK DELAY TIME:	SERIAL LEVEL
TIME TO OBJECTIVE:	SERIAL LEVEL
CASUALTIES:	SERIAL LEVEL
EQUIPMENT DAMAGE:	SERIAL LEVEL
OTHER FACTORS:	SERIAL LEVEL
OTHER RESULTS:	SERIAL LEVEL
SUPPRESSION:	SERIAL LEVEL
----- CALCULATED DATA -----	
RDS/SQ YD:	TARGET LEVEL
RDS/SQ YD/MIN:	TARGET LEVEL
LBS/SQ YD:	TARGET LEVEL
LBS/SQ YD/MIN:	TARGET LEVEL
LBS/SQ YD (EQ):	TARGET LEVEL
LBS/SQ YD/MIN (EQ):	TARGET LEVEL

## PHASE

SERIAL:	12
TARGET NUMBER:	1
PHASE NUMBER:	5
TIME:	0710
----- TARGET DATA -----	
TARGET:	TARGET LEVEL
TARGET AREA:	TARGET LEVEL
PHASE TACTICS:	CONCENTRATION
----- FIRING DATA -----	
FIRE UNIT:	1 MD REGT
TYPE WEAPONS:	E
NUMBER TUBES:	16E
TYPE AMMO:	??E
ROUNDS PER GUN:	10E
NUMBER ROUNDS:	160E
FIRE DURATION:	15
----- RESULTS DATA -----	
ATTACK DELAY TIME:	SERIAL LEVEL
TIME TO OBJECTIVE:	SERIAL LEVEL
CASUALTIES:	SERIAL LEVEL
EQUIPMENT DAMAGE:	SERIAL LEVEL
OTHER FACTORS:	SERIAL LEVEL
OTHER RESULTS:	SERIAL LEVEL
SUPPRESSION:	SERIAL LEVEL
----- CALCULATED DATA -----	
RDS/SQ YD:	TARGET LEVEL
RDS/SQ YD/MIN:	TARGET LEVEL
LBS/SQ YD:	TARGET LEVEL
LBS/SQ YD/MIN:	TARGET LEVEL
LBS/SQ YD (EQ):	TARGET LEVEL
LBS/SQ YD/MIN (EQ):	TARGET LEVEL

## TARGET

```

SERIAL:          12
TARGET NUMBER:   2
NUMBER PHASES:   4
TIME:            0610
-----
TARGET:          TARGET DATA
                  GERMANY POSITION

TARGET AREA:     5560000
TARGET TACTICS:  BARRAGE GERMANY POSITION

-----
FIRING DATA
FIRE UNIT:       PHASE LEVEL
TYPE WEAPONS:    PHASE LEVEL
NUMBER TUBES:    PHASE LEVEL
TYPE AMMO:       PHASE LEVEL
ROUNDS PER GUN:  PHASE LEVEL
NUMBER ROUNDS:   PHASE LEVEL
FIRE DURATION:   145

-----
RESULTS DATA
ATTACK DELAY TIME: SERIAL LEVEL
TIME TO OBJECTIVE: SERIAL LEVEL
CASUALTIES:       SERIAL LEVEL
EQUIPMENT DAMAGE: SERIAL LEVEL
OTHER FACTORS:    SERIAL LEVEL

OTHER RESULTS:   SERIAL LEVEL
SUPPRESSION:     SERIAL LEVEL

-----
CALCULATED DATA
RDS/SQ YD:       0.00209A,0.000117F
RDS/SQ YD/MIN:   ??A,??F
LBS/SQ YD:       0.0522A,0.00938F
LBS/SQ YD/MIN:   ??A,??F
LBS/SQ YD (EQ): 0.0522A,0.00778F
LBS/SQ YD/MIN (EQ): ??A,??F
  
```

## PHASE

```

SERIAL:          12
TARGET NUMBER:   2
PHASE NUMBER:    1
TIME:            0610
-----
TARGET:          TARGET DATA
                  TARGET LEVEL

TARGET AREA:     TARGET LEVEL
PHASE TACTICS:   BARRAGE

-----
FIRING DATA
FIRE UNIT:       2 FD REGT, 1 MD REGT
TYPE WEAPONS:    A, F
NUMBER TUBES:    48A, 8F
TYPE AMMO:       ??A, ??F
ROUNDS PER GUN:  80A, 27.5F
NUMBER ROUNDS:   3840A, 220F
FIRE DURATION:   35

-----
RESULTS DATA
ATTACK DELAY TIME: SERIAL LEVEL
TIME TO OBJECTIVE: SERIAL LEVEL
CASUALTIES:       SERIAL LEVEL
EQUIPMENT DAMAGE: SERIAL LEVEL
OTHER FACTORS:    SERIAL LEVEL

OTHER RESULTS:   SERIAL LEVEL
SUPPRESSION:     SERIAL LEVEL

-----
CALCULATED DATA
RDS/SQ YD:       TARGET LEVEL
RDS/SQ YD/MIN:   TARGET LEVEL
LBS/SQ YD:       TARGET LEVEL
LBS/SQ YD/MIN:   TARGET LEVEL
LBS/SQ YD (EQ):  TARGET LEVEL
LBS/SQ YD/MIN (EQ): TARGET LEVEL
  
```

## PHASE

SERIAL:	12
TARGET NUMBER:	2
PHASE NUMBER:	2
TIME:	0645
----- TARGET DATA -----	
TARGET:	TARGET LEVEL
TARGET AREA:	TARGET LEVEL
PHASE TACTICS:	BARRAGE
----- FIRING DATA -----	
FIRE UNIT:	2 FD REGT, 1 MD REGT
TYPE WEAPONS:	A, F
NUMBER TUBES:	48A, 8F
TYPE AMMO:	??A, ??F
ROUNDS PER GUN:	50A, 16, 6F
NUMBER ROUNDS:	2400A, 133F
FIRE DURATION:	25
----- RESULTS DATA -----	
ATTACK DELAY TIME:	SERIAL LEVEL
TIME TO OBJECTIVE:	SERIAL LEVEL
CASUALTIES:	SERIAL LEVEL
EQUIPMENT DAMAGE:	SERIAL LEVEL
OTHER FACTORS:	SERIAL LEVEL
OTHER RESULTS:	SERIAL LEVEL
SUPPRESSION:	SERIAL LEVEL
----- CALCULATED DATA -----	
RDS/SQ YD:	TARGET LEVEL
RDS/SQ YD/MIN:	TARGET LEVEL
LBS/SQ YD:	TARGET LEVEL
LBS/SQ YD/MIN:	TARGET LEVEL
LBS/SQ YD (EQ):	TARGET LEVEL
LBS/SQ YD/MIN (EQ):	TARGET LEVEL

## PHASE

SERIAL:	12
TARGET NUMBER:	2
PHASE NUMBER:	3
TIME:	0710
----- TARGET DATA -----	
TARGET:	TARGET LEVEL
TARGET AREA:	TARGET LEVEL
PHASE TACTICS:	BARRAGE
----- FIRING DATA -----	
FIRE UNIT:	1 FD REGT, 1 BATT OF MD REGT
TYPE WEAPONS:	A, F
NUMBER TUBES:	48A, 8F
TYPE AMMO:	??A, ??F
ROUNDS PER GUN:	30A, 10F
NUMBER ROUNDS:	1440A, 80F
FIRE DURATION:	15
----- RESULTS DATA -----	
ATTACK DELAY TIME:	SERIAL LEVEL
TIME TO OBJECTIVE:	SERIAL LEVEL
CASUALTIES:	SERIAL LEVEL
EQUIPMENT DAMAGE:	SERIAL LEVEL
OTHER FACTORS:	SERIAL LEVEL
OTHER RESULTS:	SERIAL LEVEL
SUPPRESSION:	SERIAL LEVEL
----- CALCULATED DATA -----	
RDS/SQ YD:	TARGET LEVEL
RDS/SQ YD/MIN:	TARGET LEVEL
LBS/SQ YD:	TARGET LEVEL
LBS/SQ YD/MIN:	TARGET LEVEL
LBS/SQ YD (EQ):	TARGET LEVEL
LBS/SQ YD/MIN (EQ):	TARGET LEVEL

# PHASE

SERIAL:	12
TARGET NUMBER:	2
PHASE NUMBER:	4
TIME:	0725
----- TARGET DATA -----	
TARGET:	TARGET LEVEL
TARGET ARFA:	TARGET LEVEL
PHASE TACTICS:	BARRAGE
----- FIRING DATA -----	
FIRE UNIT:	1 FD REGT, 1 BATT OF MO REGT
TYPE WEAPONS:	A, F
NUMBER TUBES:	48A, 8F
TYPE AMMO:	??A, ??F
ROUNDS PER GUN:	82A, 27.3F
NUMBER ROUNDS:	3936A, 218F
FIRE DURATION:	70
----- RESULTS DATA -----	
ATTACK DELAY TIME:	SERIAL LEVEL
TIME TO OBJECTIVE:	SERIAL LEVEL
CASUALTIES:	SERIAL LEVEL
EQUIPMENT DAMAGE:	SERIAL LEVEL
OTHER FACTORS:	SERIAL LEVEL
OTHER RESULTS:	SERIAL LEVEL
SUPPRESSION:	SERIAL LEVEL
----- CALCULATED DATA -----	
RDS/SQ YD:	TARGET LEVEL
RDS/SQ YD/MIN:	TARGET LEVEL
LBS/SQ YD:	TARGET LEVEL
LBS/SQ YD/MIN:	TARGET LEVEL
LBS/SQ YD (EQ):	TARGET LEVEL
LBS/SQ YD/MIN (EQ):	TARGET LEVEL



## SERIAL

SERIAL: 13  
 REF NUMBER: A2  
 ORIG REF: AORG 411  
 REF TITLE: OPERATION PANTHER-CROSSING OF THE GARIGLIANO. ATK BY 167 BDE  
 DATA SOURCE: WAR DIARIES

### ----- SERIAL DATA -----

SIDE 1 COUNTRY: BRITAIN  
 SIDE 1 UNITS: 1 BDE  
 SIDE 1 POSTURE: ATTACKING  
 SIDE 2 COUNTRY: GERMANY  
 SIDE 2 UNITS: 1 INF DIV, 1 COY, 1 RECCE UNIT  
 SIDE 2 POSTURE: DEFENDING

DATE OF ACTION: 01/17/44  
 COUNTRY: ITALY  
 REGION: RIVER GARIGLIANO  
 TERRAIN: RIVER  
 WEATHER: ??  
 TIME: 2100

SERIAL TACTICS: CAPTURE BRIDGEHEADS OVER R GARIGLIANO

NO. BMBRD TARGETS: 4  
 NO. PHASES/TGT: 1/1/2/1

### ----- TARGET DATA -----

BOMBARD TARGET: PHASE/PHASE/TARGET/PHASE

BOMBARD TGT AREA: PHASE/PHASE/TARGET/PHASE  
 BOMBARD TACTICS: TARGET LEVEL

### ----- FIRING DATA -----

FIRE UNIT: PHASE LEVEL  
 TYPE WEAPONS: PHASE LEVEL  
 NUMBER TUBES: PHASE LEVEL  
 TYPE AMMO: PHASE LEVEL  
 ROUNDS PER GUN: PHASE LEVEL  
 NUMBER ROUNDS: PHASE LEVEL  
 FIRE DURATION: TARGET LEVEL AND PHASE LEVEL

### ----- RESULTS DATA -----

ATTACK DELAY TIME: ??  
 TIME TO OBJECTIVE: 11 HOURS  
 CASUALTIES: 154 POW (GERMAN); 14 KIA, 81 WIA (BRITISH-PARTIAL)  
 EQUIPMENT DAMAGE: ??; ??  
 OTHER FACTORS: ATTACK MAY HAVE ACHIEVED SURPRISE; ONE GERMAN UNIT HAD RECENTLY SUFFERED HEAVY CASUALTIES  
 OTHER RESULTS: SUCCESSFUL BRITISH ATTACK  
 SUPPRESSION: NO NEUTRALIZATION; GERMANS HAD 1 TO 2 HOURS TO RECOVER FROM BARRAGE BEFORE THEY HAD TO FIGHT

### ----- CALCULATED DATA -----

RDS/SQ YD: PHASE/PHASE/TARGET/PHASE  
 RDS/SQ YD/MIN: PHASE/PHASE/TARGET/PHASE  
 LBS/SQ YD: PHASE/PHASE/TARGET/PHASE  
 LBS/SQ YD/MIN: PHASE/PHASE/TARGET/PHASE  
 LBS/SQ YD (EQ): PHASE/PHASE/TARGET/PHASE  
 LBS/SQ YD/MIN (EQ): PHASE/PHASE/TARGET/PHASE

## TARGET

SERIAL:	13
TARGET NUMBER:	1
NUMBER PHASES:	1
TIME:	2100
----- TARGET DATA -----	
TARGET:	PHASE LEVEL
TARGET AREA:	PHASE LEVEL
TARGET TACTICS:	BOMBARD GERMAN POSITION
----- FIRING DATA -----	
FIRE UNIT:	PHASE LEVEL
TYPE WEAPONS:	PHASE LEVEL
NUMBER TUBES:	PHASE LEVEL
TYPE AMMO:	PHASE LEVEL
ROUNDS PER GUN:	PHASE LEVEL
NUMBER ROUNDS:	PHASE LEVEL
FIRE DURATION:	50
----- RESULTS DATA -----	
ATTACK DELAY TIME:	SERIAL LEVEL
TIME TO OBJECTIVE:	SERIAL LEVEL
CASUALTIES:	SERIAL LEVEL
EQUIPMENT DAMAGE:	SERIAL LEVEL
OTHER FACTORS:	SERIAL LEVEL
OTHER RESULTS:	SERIAL LEVEL
SUPPRESSION:	SERIAL LEVEL
----- CALCULATED DATA -----	
RDS/SQ YD:	PHASE LEVEL
RDS/SQ YD/MIN:	PHASE LEVEL
LBS/SQ YD:	PHASE LEVEL
LBS/SQ YD/MIN:	PHASE LEVEL
LBS/SQ YD (EQ):	PHASE LEVEL
LBS/SQ YD/MIN (EQ):	PHASE LEVEL

## PHASE

SERIAL:	13
TARGET NUMBER:	1
PHASE NUMBER:	1
TIME:	2100
----- TARGET DATA -----	
TARGET:	GERMAN POSITION
TARGET AREA:	380000
PHASE TACTICS:	CONCENTRATION
----- FIRING DATA -----	
FIRE UNIT:	??
TYPE WEAPONS:	ABC
NUMBER TUBES:	??ABC
TYPE AMMO:	??ABC
ROUNDS PER GUN:	??ABC
NUMBER ROUNDS:	2592ABC
FIRE DURATION:	50
----- RESULTS DATA -----	
ATTACK DELAY TIME:	SERIAL LEVEL
TIME TO OBJECTIVE:	SERIAL LEVEL
CASUALTIES:	SERIAL LEVEL
EQUIPMENT DAMAGE:	SERIAL LEVEL
OTHER FACTORS:	SERIAL LEVEL
OTHER RESULTS:	SERIAL LEVEL
SUPPRESSION:	SERIAL LEVEL
----- CALCULATED DATA -----	
RDS/SQ YD:	0.0682ABC
RDS/SQ YD/MIN:	??ABC
LBS/SQ YD:	0.171ABC
LBS/SQ YD/MIN:	??ABC
LBS/SQ YD (EQ):	0.171ABC
LBS/SQ YD/MIN (EQ):	??ABC

## TARGET

SERIAL:	13
TARGET NUMBER:	2
NUMBER PHASES:	1
TIME:	2116
----- TARGET DATA -----	
TARGET:	PHASE LEVEL
TARGET AREA:	PHASE LEVEL
TARGET TACTICS:	BOMBARD GERMAN POSITION
----- FIRING DATA -----	
FIRE UNIT:	PHASE LEVEL
TYPE WEAPONS:	PHASE LEVEL
NUMBER TUBES:	PHASE LEVEL
TYPE AMMO:	PHASE LEVEL
ROUNDS PER GUN:	PHASE LEVEL
NUMBER ROUNDS:	PHASE LEVEL
FIRE DURATION:	290
----- RESULTS DATA -----	
ATTACK DELAY TIME:	SERIAL LEVEL
TIME TO OBJECTIVE:	SERIAL LEVEL
CASUALTIES:	SERIAL LEVEL
EQUIPMENT DAMAGE:	SERIAL LEVEL
OTHER FACTORS:	SERIAL LEVEL
OTHER RESULTS:	SERIAL LEVEL
SUPPRESSION:	SERIAL LEVEL
----- CALCULATED DATA -----	
RDS/SQ YD:	PHASE LEVEL
RDS/SQ YD/MIN:	PHASE LEVEL
LBS/SQ YD:	PHASE LEVEL
LBS/SQ YD/MIN:	PHASE LEVEL
LBS/SQ YD (EQ):	PHASE LEVEL
LBS/SQ YD/MIN (EQ):	PHASE LEVEL

## PHASE

SERIAL:	13
TARGET NUMBER:	2
PHASE NUMBER:	1
TIME:	2116
----- TARGET DATA -----	
TARGET:	GERMAN POSITION
TARGET AREA:	410000
PHASE TACTICS:	CONCENTRATION
----- FIRING DATA -----	
FIRE UNIT:	??
TYPE WEAPONS:	ABC,EBF,H
NUMBER TUBES:	??ABC,??E&F,??H
TYPE AMMO:	??ABC,??E&F,??H
ROUNDS PER GUN:	??ABC,??E&F,??H
NUMBER ROUNDS:	2048ABC,336E&F,60H
FIRE DURATION:	290
----- RESULTS DATA -----	
ATTACK DELAY TIME:	SERIAL LEVEL
TIME TO OBJECTIVE:	SERIAL LEVEL
CASUALTIES:	SERIAL LEVEL
EQUIPMENT DAMAGE:	SERIAL LEVEL
OTHER FACTORS:	SERIAL LEVEL
OTHER RESULTS:	SERIAL LEVEL
SUPPRESSION:	SERIAL LEVEL
----- CALCULATED DATA -----	
RDS/SQ YD:	0.05ABC,0.00082E&F,0.000146H
RDS/SQ YD/MIN:	??ABC,??E&F,??H
LBS/SQ YD:	0.125ABC,0.0553E&F,0.296H
LBS/SQ YD/MIN:	??ABC,??E&F,??H
LBS/SQ YD (EQ):	0.125ABC,0.0459E&F,0.0143H
LBS/SQ YD/MIN (EQ):	??ABC,??E&F,??H

## TARGET

```

SERIAL:          13
TARGET NUMBER:   3
NUMBER PHASES:   2
TIME:            2102
----- TARGET DATA -----
TARGET:          GERMAN POSITION

TARGET AREA:     2420000
TARGET TACTICS:  BOMBARD GERMAN POSITION

----- FIRING DATA -----
FIRE UNIT:       PHASE LEVEL
TYPE WEAPONS:    PHASE LEVEL
NUMBER TUBES:    PHASE LEVEL
TYPE AMMO:       PHASE LEVEL
ROUND PER GUN:   PHASE LEVEL
NUMBER ROUNDS:   PHASE LEVEL
FIRE DURATION:   538

----- RESULTS DATA -----
ATTACK DELAY TIME: SERIAL LEVEL
TIME TO OBJECTIVE: SERIAL LEVEL
CASUALTIES:       SERIAL LEVEL
EQUIPMENT DAMAGE: SERIAL LEVEL
OTHER FACTORS:    SERIAL LEVEL

OTHER RESULTS:   SERIAL LEVEL
SUPPRESSION:     SERIAL LEVEL

----- CALCULATED DATA -----
RDS/SQ YD:       0.00489A&C,0.000555E&F,0.0000826H
RDS/SQ YD/MIN:   ??A&C,??E&F,??H
LBS/SQ YD:       0.0122A&C,0.0375E&F,0.0167H
LBS/SQ YD/MIN:   ??A&C,??E&F,??H
LBS/SQ YD (EQ):  0.0122A&C,0.0311E&F,0.00809H
LBS/SQ YD/MIN (EQ): ??A&C,??E&F,??H
  
```

## PHASE

```

SERIAL:          13
TARGET NUMBER:   3
PHASE NUMBER:    1
TIME:            2102
----- TARGET DATA -----
TARGET:          TARGET LEVEL

TARGET AREA:     TARGET LEVEL
PHASE TACTICS:   CONCENTRATION

----- FIRING DATA -----
FIRE UNIT:       ??
TYPE WEAPONS:    A&C,E&F,H
NUMBER TUBES:    ??A&C,??E&F,??H
TYPE AMMO:       ??A&C,??E&F,??H
ROUNDS PER GUN:  ??A&C,??E&F,??H
NUMBER ROUNDS:   1184A&C,1344E&F,200H
FIRE DURATION:   272

----- RESULTS DATA -----
ATTACK DELAY TIME: SERIAL LEVEL
TIME TO OBJECTIVE: SERIAL LEVEL
CASUALTIES:       SERIAL LEVEL
EQUIPMENT DAMAGE: SERIAL LEVEL
OTHER FACTORS:    SERIAL LEVEL

OTHER RESULTS:   SERIAL LEVEL
SUPPRESSION:     SERIAL LEVEL

----- CALCULATED DATA -----
RDS/SQ YD:       TARGET LEVEL
RDS/SQ YD/MIN:   TARGET LEVEL
LBS/SQ YD:       TARGET LEVEL
LBS/SQ YD/MIN:   TARGET LEVEL
LBS/SQ YD (EQ):  TARGET LEVEL
LBS/SQ YD/MIN (EQ): TARGET LEVEL
  
```

## PHASE

SERIAL:	13
TARGET NUMBER:	3
PHASE NUMBER:	2
TIME:	2300
----- TARGET DATA -----	
TARGET:	TARGET LEVEL
TARGET AREA:	TARGET LEVEL
PHASE TACTICS:	BARRAGE
----- FIRING DATA -----	
FIRE UNIT:	??
TYPE WEAPONS:	A&C,E&F
NUMBER TUBES:	??A&C,??E&F
TYPE AMMO:	??A&C,??E&F
ROUNDS PER GUN:	??A&C,??E&F
NUMBER ROUNDS:	11466A&C,480E&F
FIRE DURATION:	420
----- RESULTS DATA -----	
ATTACK DELAY TIME:	SERIAL LEVEL
TIME TO OBJECTIVE:	SERIAL LEVEL
CASUALTIES:	SERIAL LEVEL
EQUIPMENT DAMAGE:	SERIAL LEVEL
OTHER FACTORS:	SERIAL LEVEL
OTHER RESULTS:	SERIAL LEVEL
SUPPRESSION:	SERIAL LEVEL
----- CALCULATED DATA -----	
RDS/SQ YD:	TARGET LEVEL
RDS/SQ YD/MIN:	TARGET LEVEL
LBS/SQ YD:	TARGET LEVEL
LBS/SQ YD/MIN:	TARGET LEVEL
LBS/SQ YD (EQ):	TARGET LEVEL
LBS/SQ YD/MIN (EQ):	TARGET LEVEL

## TARGET

SERIAL:	13
TARGET NUMBER:	4
NUMBER PHASES:	1
TIME:	2109
----- TARGET DATA -----	
TARGET:	PHASE LEVEL
TARGET AREA:	PHASE LEVEL
TARGET TACTICS:	BOMBARD GERMAN POSITION
----- FIRING DATA -----	
FIRE UNIT:	PHASE LEVEL
TYPE WEAPONS:	PHASE LEVEL
NUMBER TUBES:	PHASE LEVEL
TYPE AMMO:	PHASE LEVEL
ROUNDS PER GUN:	PHASE LEVEL
NUMBER ROUNDS:	PHASE LEVEL
FIR: DURATION:	473
----- RESULTS DATA -----	
ATTACK DELAY TIME:	SERIAL LEVEL
TIME TO OBJECTIVE:	SERIAL LEVEL
CASUALTIES:	SERIAL LEVEL
EQUIPMENT DAMAGE:	SERIAL LEVEL
OTHER FACTORS:	SERIAL LEVEL
OTHER RESULTS:	SERIAL LEVEL
SUPPRESSION:	SERIAL LEVEL
----- CALCULATED DATA -----	
RDS/SQ YD:	PHASE LEVEL
RDS/SQ YD/MIN:	PHASE LEVEL
LBS/SQ YD:	PHASE LEVEL
LBS/SQ YD/MIN:	PHASE LEVEL
LBS/SQ YD (EQ):	PHASE LEVEL
LBS/SQ YD/MIN (EQ):	PHASE LEVEL

# PHASE

SERIAL: 13  
TARGET NUMBER: 4  
PHASE NUMBER: 1  
TIME: 2109

----- TARGET DATA -----  
TARGET: GERMAN POSITION

TARGET AREA: 3860000  
PHASE TACTICS: CONCENTRATION

----- FIRING DATA -----  
FIRE UNIT: ??  
TYPE WEAPONS: A&C, E&F, H  
NUMBER TUBES: ??A&C, ??E&F, ??H  
TYPE AMMO: ??A&C, ??E&F, ??H  
ROUNDS PER GUN: ??A&C, ??E&F, ??H  
NUMBER ROUNDS: 7712A&C, 2838E&F, 428H  
FIRE DURATION: 473

----- RESULTS DATA -----  
ATTACK DELAY TIME: SERIAL LEVEL  
TIME TO OBJECTIVE: SERIAL LEVEL  
CASUALTIES: SERIAL LEVEL  
EQUIPMENT DAMAGE: SERIAL LEVEL  
OTHER FACTORS: SERIAL LEVEL

OTHER RESULTS: SERIAL LEVEL  
SUPPRESSION: SERIAL LEVEL

----- CALCULATED DATA -----  
RDS/SQ YD: 0.002A&C, 0.000735E&F, 0.000111H  
RDS/SQ YD/MIN: ??A&C, ??E&F, ??H  
LBS/SQ YD: 0.0499A&C, 0.0496E&F, 0.0224H  
LBS/SQ YD/MIN: ??A&C, ??E&F, ??H  
LBS/SQ YD (EQ): 0.0499A&C, 0.0412E&F, 0.00109H  
LBS/SQ YD/MIN (EQ): ??A&C, ??E&F, ??H

## SERIAL

SERIAL: 14  
REF NUMBER: A3  
ORIG REF: AORG 412  
REF TITLE: ATTACK BY 2BN NORTHAMPTONSHIRE REGT ON PT156, M775967  
DATA SOURCE: WAR DIARIES

### ----- SERIAL DATA -----

SIDE 1 COUNTRY: BRITAIN  
SIDE 1 UNITS: 1 BN  
SIDE 1 POSTURE: ATTACKING  
SIDE 2 COUNTRY: GERMANY  
SIDE 2 UNITS: ??  
SIDE 2 POSTURE: DEFENDING

DATE OF ACTION: 01/30/44  
COUNTRY: ITALY  
REGION: SESSA AURUNCA  
TERRAIN: MOUNTAINOUS  
WEATHER: ??  
TIME: 0130

SERIAL TACTICS: SEIZE GROUND ROUND PT156

NO. BMBRD TARGETS: 1  
NO. PHASES/TGT: 6

### ----- TARGET DATA -----

BOMBARD TARGET: TARGET LEVEL

BOMBARD TGT AREA: TARGET LEVEL  
BOMBARD TACTICS: TARGET LEVEL

### ----- FIRING DATA -----

FIRE UNIT: PHASE LEVEL  
TYPE WEAPONS: PHASE LEVEL  
NUMBER TUBES: PHASE LEVEL  
TYPE AMMO: PHASE LEVEL  
ROUNDS PER GUN: PHASE LEVEL  
NUMBER ROUNDS: PHASE LEVEL  
FIRE DURATION: TARGET LEVEL AND PHASE LEVEL

### ----- RESULTS DATA -----

ATTACK DELAY TIME: ??  
TIME TO OBJECTIVE: 225 MINUTES  
CASUALTIES: 34 POW (GERMAN); 1 KIA, 32 WIA (BRITISH)  
EQUIPMENT DAMAGE: ??; ??  
OTHER FACTORS: GERMANS WERE IN FAVORABLE TACTICAL SITUATION AND AN UNFAVORABLE STRATEGIC SITUATION  
OTHER RESULTS: GERMAN MORALE SIGNIFICANTLY REDUCED BY ARTILLERY FIRE OF 0.2 PPSY OVER 2.5 HRS  
SUPPRESSION: MOST GERMANS WERE NEUTRALIZED

### ----- CALCULATED DATA -----

RDS/SQ YD: TARGET LEVEL  
RDS/SQ YD/MIN: TARGET LEVEL  
LBS/SQ YD: TARGET LEVEL  
LBS/SQ YD/MIN: TARGET LEVEL  
LBS/SQ YD (EQ): TARGET LEVEL  
LBS/SQ YD/MIN (EQ): TARGET LEVEL

## TARGET

SERIAL:	14
TARGET NUMBER:	1
NUMBER PHASES:	6
TIME:	0030
----- TARGET DATA -----	
TARGET:	GERMAN POSITION
TARGET AREA:	700000
TARGET TACTICS:	BOMBARD GERMAN POSITION
----- FIRING DATA -----	
FIRE UNIT:	PHASE LEVEL
TYPE WEAPONS:	PHASE LEVEL
NUMBER TUBES:	PHASE LEVEL
TYPE AMMO:	PHASE LEVEL
ROUNDS PER GUN:	PHASE LEVEL
NUMBER ROUNDS:	PHASE LEVEL
FIRE DURATION:	170
----- RESULTS DATA -----	
ATTACK DELAY TIME:	SERIAL LEVEL
TIME TO OBJECTIVE:	SERIAL LEVEL
CASUALTIES:	SERIAL LEVEL
EQUIPMENT DAMAGE:	SERIAL LEVEL
OTHER FACTORS:	SERIAL LEVEL
OTHER RESULTS:	SERIAL LEVEL
SUPPRESSION:	SERIAL LEVEL
----- CALCULATED DATA -----	
RDS/SQ YD:	0.0096A,0.000343D
RDS/SQ YD/MIN:	??A,??D
LBS/SQ YD:	0.24A,0.00701D
LBS/SQ YD/MIN:	??A,??D
LBS/SQ YD (EQ):	0.24A,0.00857D
LBS/SQ YD/MIN (EQ):	??A,??D

## PHASE

SERIAL:	14
TARGET NUMBER:	1
PHASE NUMBER:	1
TIME:	0030
----- TARGET DATA -----	
TARGET:	TARGET LEVEL
TARGET AREA:	TARGET LEVEL
PHASE TACTICS:	CONCENTRATION
----- FIRING DATA -----	
FIRE UNIT:	1 FD REGT
TYPE WEAPONS:	A
NUMBER TUBES:	24A
TYPE AMMO:	??A
ROUNDS PER GUN:	30A
NUMBER ROUNDS:	720A
FIRE DURATION:	15
----- RESULTS DATA -----	
ATTACK DELAY TIME:	SERIAL LEVEL
TIME TO OBJECTIVE:	SERIAL LEVEL
CASUALTIES:	SERIAL LEVEL
EQUIPMENT DAMAGE:	SERIAL LEVEL
OTHER FACTORS:	SERIAL LEVEL
OTHER RESULTS:	SERIAL LEVEL
SUPPRESSION:	SERIAL LEVEL
----- CALCULATED DATA -----	
RDS/SQ YD:	TARGET LEVEL
RDS/SQ YD/MIN:	TARGET LEVEL
LBS/SQ YD:	TARGET LEVEL
LBS/SQ YD/MIN:	TARGET LEVEL
LBS/SQ YD (EQ):	TARGET LEVEL
LBS/SQ YD/MIN (EQ):	TARGET LEVEL

## PHASE

SERIAL:	14
TARGET NUMBER:	1
PHASE NUMBER:	2
TIME:	0115
----- TARGET DATA -----	
TARGET:	TARGET LEVEL
TARGET AREA:	TARGET LEVEL
PHASE TACTICS:	BARRAGE
----- FIRING DATA -----	
FIRE UNIT:	1 FD REGT
TYPE WEAPONS:	A
NUMBER TUBES:	24A
TYPE AMMO:	??A
ROUNDS PER GUN:	30A
NUMBER ROUNDS:	720A
FIRE DURATION:	15
----- RESULTS DATA -----	
ATTACK DELAY TIME:	SERIAL LEVEL
TIME TO OBJECTIVE:	SERIAL LEVEL
CASUALTIES:	SERIAL LEVEL
EQUIPMENT DAMAGE:	SERIAL LEVEL
OTHER FACTORS:	SERIAL LEVEL
OTHER RESULTS:	SERIAL LEVEL
SUPPRESSION:	SERIAL LEVEL
----- CALCULATED DATA -----	
RDS/SQ YD:	TARGET LEVEL
RDS/SQ YD/MIN:	TARGET LEVEL
LBS/SQ YD:	TARGET LEVEL
LBS/SQ YD/MIN:	TARGET LEVEL
LBS/SQ YD (EQ):	TARGET LEVEL
LBS/SQ YD/MIN (EQ):	TARGET LEVEL

## PHASE

SERIAL:	14
TARGET NUMBER:	1
PHASE NUMBER:	3
TIME:	0130
----- TARGET DATA -----	
TARGET:	TARGET LEVEL
TARGET AREA:	TARGET LEVEL
PHASE TACTICS:	BARRAGE
----- FIRING DATA -----	
FIRE UNIT:	1 FD REGT
TYPE WEAPONS:	A
NUMBER TUBES:	24A
TYPE AMMO:	??A
ROUNDS PER GUN:	60A
NUMBER ROUNDS:	1440A
FIRE DURATION:	30
----- RESULTS DATA -----	
ATTACK DELAY TIME:	SERIAL LEVEL
TIME TO OBJECTIVE:	SERIAL LEVEL
CASUALTIES:	SERIAL LEVEL
EQUIPMENT DAMAGE:	SERIAL LEVEL
OTHER FACTORS:	SERIAL LEVEL
OTHER RESULTS:	SERIAL LEVEL
SUPPRESSION:	SERIAL LEVEL
----- CALCULATED DATA -----	
RDS/SQ YD:	TARGET LEVEL
RDS/SQ YD/MIN:	TARGET LEVEL
LBS/SQ YD:	TARGET LEVEL
LBS/SQ YD/MIN:	TARGET LEVEL
LBS/SQ YD (EQ):	TARGET LEVEL
LBS/SQ YD/MIN (EQ):	TARGET LEVEL

## PHASE

SERIAL:	14
TARGET NUMBER:	1
PHASE NUMBER:	4
TIME:	0200
----- TARGET DATA -----	
TARGET:	TARGET LEVEL
TARGET AREA:	TARGET LEVEL
PHASE TACTICS:	BARRAGE
----- FIRING DATA -----	
FIRE UNIT:	1 FD REGT
TYPE WEAPONS:	A
NUMBER TUBES:	24A
TYPE AMMO:	??A
ROUNDS PER GUN:	40A
NUMBER ROUNDS:	960A
FIRE DURATION:	20
----- RESULTS DATA -----	
ATTACK DELAY TIME:	SERIAL LEVEL
TIME TO OBJECTIVE:	SERIAL LEVEL
CASUALTIES:	SERIAL LEVEL
EQUIPMENT DAMAGE:	SERIAL LEVEL
OTHER FACTORS:	SERIAL LEVEL
OTHER RESULTS:	SERIAL LEVEL
SUPPRESSION:	SERIAL LEVEL
----- CALCULATED DATA -----	
RDS/SQ YD:	TARGET LEVEL
RDS/SQ YD/MIN:	TARGET LEVEL
LBS/SQ YD:	TARGET LEVEL
LBS/SQ YD/MIN:	TARGET LEVEL
LBS/SQ YD (EQ):	TARGET LEVEL
LBS/SQ YD/MIN (EQ):	TARGET LEVEL

## PHASE

SERIAL:	14
TARGET NUMBER:	1
PHASE NUMBER:	5
TIME:	0030
----- TARGET DATA -----	
TARGET:	TARGET LEVEL
TARGET AREA:	TARGET LEVEL
PHASE TACTICS:	BARRAGE
----- FIRING DATA -----	
FIRE UNIT:	1 4.2 IN MORTAR COY OF 1 BDE
TYPE WEAPONS:	D
NUMBER TUBES:	??D
TYPE AMMO:	??D
ROUNDS PER GUN:	??D
NUMBER ROUNDS:	2400
FIRE DURATION:	55
----- RESULTS DATA -----	
ATTACK DELAY TIME:	SERIAL LEVEL
TIME TO OBJECTIVE:	SERIAL LEVEL
CASUALTIES:	SERIAL LEVEL
EQUIPMENT DAMAGE:	SERIAL LEVEL
OTHER FACTORS:	SERIAL LEVEL
OTHER RESULTS:	SERIAL LEVEL
SUPPRESSION:	SERIAL LEVEL
----- CALCULATED DATA -----	
RDS/SQ YD:	TARGET LEVEL
RDS/SQ YD/MIN:	TARGET LEVEL
LBS/SQ YD:	TARGET LEVEL
LBS/SQ YD/MIN:	TARGET LEVEL
LBS/SQ YD (EQ):	TARGET LEVEL
LBS/SQ YD/MIN (EQ):	TARGET LEVEL

# PHASE

SERIAL:	14
TARGET NUMBER:	1
PHASE NUMBER:	6
TIME:	0220
----- TARGET DATA -----	
TARGET:	TARGET LEVEL
TARGET AREA:	TARGET LEVEL
PHASE TACTICS:	BARRAGE
----- FIRING DATA -----	
FIRE UNIT:	1 FO REGT
TYPE WEAPONS:	A
NUMBER TUBES:	24A
TYPE AMMO:	??A
ROUNDS PER GUN:	120A
NUMBER ROUNDS:	2880A
FIRE DURATION:	60
----- RESULTS DATA -----	
ATTACK DELAY TIME:	SERIAL LEVEL
TIME TO OBJECTIVE:	SERIAL LEVEL
CASUALTIES:	SERIAL LEVEL
EQUIPMENT DAMAGE:	SERIAL LEVEL
OTHER FACTORS:	SERIAL LEVEL
OTHER RESULTS:	SERIAL LEVEL
SUPPRESSION:	SERIAL LEVEL
----- CALCULATED DATA -----	
RDS/SQ YD:	TARGET LEVEL
RDS/SQ YD/MIN:	TARGET LEVEL
LBS/SQ YD:	TARGET LEVEL
LBS/SQ YD/MIN:	TARGET LEVEL
LBS/SQ YD (EQ):	TARGET LEVEL
LBS/SQ YD/MIN (EQ):	TARGET LEVEL



## SERIAL

SERIAL:	15
REF NUMBER:	A39
ORIG REF:	24/GEN/2431
REF TITLE:	EFFECTS OF BOMBARDMENT ON THE EFFICIENCY OF MEN
DATA SOURCE:	EXPERIMENTS

----- SERIAL DATA -----

SIDE 1 COUNTRY:	N/A
SIDE 1 UNITS:	N/A
SIDE 1 POSTURE:	N/A
SIDE 2 COUNTRY:	N/A
SIDE 2 UNITS:	N/A
SIDE 2 POSTURE:	N/A

DATE OF ACTION:	N/A
COUNTRY:	N/A
REGION:	N/A
TERRAIN:	N/A
WEATHER:	N/A
TIME:	N/A

SERIAL TACTICS: N/A

NO. BMBRD TARGETS:	N/A
NO. PHASES/TGT:	N/A

----- TARGET DATA -----

BOMBARD TARGET:	N/A
BOMBARD TGT AREA:	N/A
BOMBARD TACTICS:	N/A

----- FIRING DATA -----

FIRE UNIT:	N/A
TYPE WEAPONS:	N/A
NUMBER TUBES:	N/A
TYPE AMMO:	N/A
ROUNDS PER GUN:	N/A
NUMBER ROUNDS:	N/A
FIRE DURATION:	N/A

----- RESULTS DATA -----

ATTACK DELAY TIME:	N/A
TIME TO OBJECTIVE:	N/A
CASUALTIES:	N/A
EQUIPMENT DAMAGE:	N/A
OTHER FACTORS:	SUBJECTS WERE AWARE THAT THEY WERE NOT IN DANGER

OTHER RESULTS: EFFICIENCY WAS NOT SIGNIFICANTLY ALTERED

SUPPRESSION: NEITHER SUPPRESSION NOR NEUTRALIZATION (BECAUSE NO PERCEPTION OF DANGER)

----- CALCULATED DATA -----

RDS/SQ YD:	N/A
RDS/SQ YD/MIN:	N/A
LBS/SQ YD:	N/A
LBS/SQ YD/MIN:	N/A
LBS/SQ YD (EQ):	N/A
LBS/SQ YD/MIN (EQ):	N/A



# SERIAL

SERIAL: 16  
REF NUMBER: A39  
ORIG REF: 24/GEN/2431  
REF TITLE: EFFECTS OF BOMBARDMENT ON THE EFFICIENCY OF MEN  
DATA SOURCE: EXPERIENCE

## SERIAL DATA

SIDE 1 COUNTRY: N/A  
SIDE 1 UNITS: N/A  
SIDE 1 POSTURE: N/A  
SIDE 2 COUNTRY: N/A  
SIDE 2 UNITS: N/A  
SIDE 2 POSTURE: N/A

DATE OF ACTION: N/A  
COUNTRY: N/A  
REGION: N/A  
TERRAIN: N/A  
WEATHER: N/A  
TIME: N/A

SERIAL TACTICS: N/A

NO. BMBRD TARGETS: N/A  
NO. PHASES/TGT: N/A

## TARGET DATA

BOMBARD TARGET: N/A

BOMBARD TGT AREA: N/A  
BOMBARD TACTICS: N/A

## FIRING DATA

FIRE UNIT: N/A  
TYPE WEAPONS: N/A  
NUMBER TUBES: N/A  
TYPE AMMO: N/A  
ROUNDS PER GUN: N/A  
NUMBER ROUNDS: N/A  
FIRE DURATION: N/A

## RESULTS DATA

ATTACK DELAY TIME: N/A  
TIME TO OBJECTIVE: N/A  
CASUALTIES: N/A  
EQUIPMENT DAMAGE: N/A  
OTHER FACTORS: N/A

OTHER RESULTS: SUPPORT TROOPS RECOVER WHEN PLACED IN REAR OF ARTILLERY  
SUPPRESSION: N/A

## CALCULATED DATA

RDS/SQ YD: N/A  
RDS/SQ YD/MIN: N/A  
LBS/SQ YD: N/A  
LBS/SQ YD/MIN: N/A  
LBS/SQ YD (EQ): N/A  
LBS/SQ YD/MIN (EQ): N/A



SERIAL

SERIAL: 17  
 REF NUMBER: A30  
 ORIG REF: MORU 23  
 REF TITLE: OPERATION GOODWOOD  
 DATA SOURCE: ACTION REPORTS (MULTIPLE)

----- SERIAL DATA -----

SIDE 1 COUNTRY: BRITAIN  
 SIDE 1 UNITS: 2 CORPS, 1 CDM CORPS, BOMBER COMMAND  
 SIDE 1 POSTURE: ATTACKING  
 SIDE 2 COUNTRY: GERMANY  
 SIDE 2 UNITS: 1 AF DIV, 3 SS PANZER DIV  
 SIDE 2 POSTURE: DEFENDING

DATE OF ACTION: 07/18/44 - 07/21/44  
 COUNTRY: FRANCE  
 REGION: CAEN  
 TERRAIN: FAIRLY OPEN; COMPACT STONE VILLAGES; FENCED ROADS  
 WEATHER: ??  
 TIME: 0745, 07/18/44

SERIAL TACTICS: BREAK OUT OF BRIDGEHEAD; INDUCE ENEMY TO COMMIT THEIR STRATEGIC MOBIL  
 E RESERVES

NO. BMBRD TARGETS: 7  
 NO. PHASES/TGT: 1/1/1/1/1/1

----- TARGET DATA -----

BOMBARD TARGET: PHASE LEVEL

BOMBARD TGT AREA: PHASE LEVEL  
 BOMBARD TACTICS: TARGET LEVEL

----- FIRING DATA -----

FIRE UNIT: PHASE LEVEL  
 TYPE WEAPONS: PHASE LEVEL  
 NUMBER TUBES: PHASE LEVEL  
 TYPE AMMO: PHASE LEVEL  
 ROUNDS PER GUN: PHASE LEVEL  
 NUMBER ROUNDS: PHASE LEVEL  
 FIRE DURATION: TARGET LEVEL AND PHASE LEVEL

----- RESULTS DATA -----

ATTACK DELAY TIME: ??  
 TIME TO OBJECTIVE: ??  
 CASUALTIES: ?? (GERMAN); 4011 CASUALTIES (BRITISH)  
 EQUIPMENT DAMAGE: ?? (GERMAN); 493 TANKS (BRITISH)  
 OTHER FACTORS: NONE

OTHER RESULTS: ALLIES ADV 34 SQUARE MILES; TROOPS GRADUALLY REGAINED MORALE AFTER BMBD ENDED  
 SUPPRESSION: BMD DENSITY OF 0.17 LBS PER SQ YD WILL NEUTRALIZE IF ACCOMPANIED BY  
 ARMORED ATTACK; 0.58 LBS PER SQ YD IN 45 MIN FOLLOWED BY 0.1 LBS PER  
 SQ YD NEUTRALIZED TROOPS IN OPEN DEFENSES IN URBAN AREA

----- CALCULATED DATA -----

RDS/SQ YD: PHASE LEVEL  
 RDS/SQ YD/MIN: PHASE LEVEL  
 LBS/SQ YD: PHASE LEVEL  
 LBS/SQ YD/MIN: PHASE LEVEL  
 LBS/SQ YD (EQ): PHASE LEVEL  
 LBS/SQ YD/MIN (EQ): PHASE LEVEL

## TARGET

SERIAL:	17
TARGET NUMBER:	1
NUMBER PHASES:	1
TIME:	0545
----- TARGET DATA -----	
TARGET:	PHASE LEVEL
TARGET AREA:	PHASE LEVEL
TARGET TACTICS:	AERIAL AND ARTILLERY BOMBARDMENT
----- FIRING DATA -----	
FIRE UNIT:	PHASE LEVEL
TYPE WEAPONS:	PHASE LEVEL
NUMBER TUBES:	PHASE LEVEL
TYPE AMMO:	PHASE LEVEL
ROUNDS PER GUN:	PHASE LEVEL
NUMBER ROUNDS:	PHASE LEVEL
FIRE DURATION:	45
----- RESULTS DATA -----	
ATTACK DELAY TIME:	??
TIME TO OBJECTIVE:	??
CASUALTIES:	??;??
EQUIPMENT DAMAGE:	??;??
OTHER FACTORS:	BOMB DISTRIBUTION SATISFACTORY
OTHER RESULTS:	??
SUPPRESSION:	STRONG RESISTANCE IN AREAS NOT COVERED BY BOMBS; NEUTRALIZATION OF THE REST
----- CALCULATED DATA -----	
RDS/SQ YD:	PHASE LEVEL
RDS/SQ YD/MIN:	PHASE LEVEL
LBS/SQ YD:	PHASE LEVEL
LBS/SQ YD/MIN:	PHASE LEVEL
LBS/SQ YD (EQ):	PHASE LEVEL
LBS/SQ YD/MIN (EQ):	PHASE LEVEL

## PHASE

SERIAL:	17
TARGET NUMBER:	1
PHASE NUMBER:	1
TIME:	0545
----- TARGET DATA -----	
TARGET:	COLOMBELLES FACTORY AREA AND MONDEVILLE
TARGET AREA:	6490000
PHASE TACTICS:	??
----- FIRING DATA -----	
FIRE UNIT:	RAF BOMBER COMMAND/CORP ARTILLERY
TYPE WEAPONS:	AA,EE/??
NUMBER TUBES:	??AA,??EE/??
TYPE AMMO:	FUSED .025 DELAY AAMEE/??
ROUNDS PER GUN:	??AA,??EE/??
NUMBER ROUNDS:	4638AA,3432EE/??
FIRE DURATION:	45
----- RESULTS DATA -----	
ATTACK DELAY TIME:	TARGET LEVEL
TIME TO OBJECTIVE:	TARGET LEVEL
CASUALTIES:	TARGET LEVEL
EQUIPMENT DAMAGE:	TARGET LEVEL
OTHER FACTORS:	TARGET LEVEL
OTHER RESULTS:	TARGET LEVEL
SUPPRESSION:	TARGET LEVEL
----- CALCULATED DATA -----	
RDS/SQ YD:	??AA,??EE/??
RDS/SQ YD/MIN:	??AA,??EE/??
LBS/SQ YD:	0.65AABE/??
LBS/SQ YD/MIN:	??AA,??EE/??
LBS/SQ YD (EQ):	0.56AABE/0.1??
LBS/SQ YD/MIN (EQ):	??AA,??EE/??

## TARGET

```

SERIAL: 17
TARGET NUMBER: 2
NUMBER PHASES: 1
TIME: 0545
----- TARGET DATA -----
TARGET: PHASE LEVEL

TARGET AREA: PHASE LEVEL
TARGET TACTICS: AERIAL AND ARTILLERY BOMBARDMENT

----- FIRING DATA -----
FIRE UNIT: PHASE LEVEL
TYPE WEAPONS: PHASE LEVEL
NUMBER TUBES: PHASE LEVEL
TYPE AMMO: PHASE LEVEL
ROUNDS PER GUN: PHASE LEVEL
NUMBER ROUNDS: PHASE LEVEL
FIRE DURATION: 45

----- RESULTS DATA -----
ATTACK DELAY TIME: ??/??/4 HOURS
TIME TO OBJECTIVE: 7 HOURS/??/APPROX. 24 HOURS
CASUALTIES: ??/??/??
EQUIPMENT DAMAGE: ??/??/ TANK SQUADRON KNOCKED OUT (GERMAN)
OTHER FACTORS: NOT BOMBED/BOMBED/HEAVILY BOMBED

OTHER RESULTS: STIFF RESISTANCE/LITTLE RESISTANCE/STIFF RESISTANCE
SUPPRESSION: ??/??/??

----- CALCULATED DATA -----
RDS/SQ YD: PHASE LEVEL
RDS/SQ YD/MIN: PHASE LEVEL
LBS/SQ YD: PHASE LEVEL
LBS/SQ YD/MIN: PHASE LEVEL
LBS/SQ YD (EQ): PHASE LEVEL
LBS/SQ YD/MIN (EQ): PHASE LEVEL
    
```

## PHASE

```

SERIAL: 17
TARGET NUMBER: 2
PHASE NUMBER: 1
TIME: 0545
----- TARGET DATA -----
TARGET: SEVERAL STRONGLY HELD VILLAGES - TOUFFREVILLE, SANNEVILLE & BANNEVILLE, AND CUIILLERVILLE
TARGET AREA: 4210000 (MAIN CONCENTRATION AREA)
PHASE TACTICS: ??

----- FIRING DATA -----
FIRE UNIT: RAF BOMBER COMMAND/CORPS ARTILLERY
TYPE WEAPONS: AA,EE/??
NUMBER TUBES: ??AA,??EE/??
TYPE AMMO: FUSED .025 DELAY AABEE/??
ROUNDS PER GUN: ??AA,??EE/??
NUMBER ROUNDS: 5150AA,2550EE/??
FIRE DURATION: 45

----- RESULTS DATA -----
ATTACK DELAY TIME: TARGET LEVEL
TIME TO OBJECTIVE: TARGET LEVEL
CASUALTIES: TARGET LEVEL
EQUIPMENT DAMAGE: TARGET LEVEL
OTHER FACTORS: TARGET LEVEL

OTHER RESULTS: TARGET LEVEL
SUPPRESSION: TARGET LEVEL

----- CALCULATED DATA -----
RDS/SQ YD: ??AA,??EE/??
RDS/SQ YD/MIN: ??AA,??EE/??
LBS/SQ YD: 0.97AABEE/??
LBS/SQ YD/MIN: ??AA,??EE/??
LBS/SQ YD (EQ): 0.87AABEE/??
LBS/SQ YD/MIN (EQ): ??AA,??EE/??
    
```

## TARGET

SERIAL: 17  
TARGET NUMBER: 3  
NUMBER PHASES: 1  
TIME: 0545

----- TARGET DATA -----  
TARGET: PHASE LEVEL

TARGET AREA: PHASE LEVEL  
TARGET TACTICS: AERIAL AND ARTILLERY BOMBARDMENT

----- FIRING DATA -----  
FIRE UNIT: PHASE LEVEL  
TYPE WEAPONS: PHASE LEVEL  
NUMBER TUBES: PHASE LEVEL  
TYPE AMMO: PHASE LEVEL  
ROUNDS PER GUN: PHASE LEVEL  
NUMBER ROUNDS: PHASE LEVEL  
FIRE DURATION: 45

----- RESULTS DATA -----  
ATTACK DELAY TIME: 2 HOURS  
TIME TO OBJECTIVE: ??  
CASUALTIES: ??;??  
EQUIPMENT DAMAGE: ??;??  
OTHER FACTORS: PROBABLE THAT VILLAGE WAS REINFORCED BY 21 SS PANZER DIV

OTHER RESULTS: ARMOR ATTACK REPULSED  
SUPPRESSION: ??

----- CALCULATED DATA -----  
RDS/SQ YD: PHASE LEVEL  
RDS/SQ YD/MIN: PHASE LEVEL  
LBS/SQ YD: PHASE LEVEL  
LBS/SQ YD/MIN: PHASE LEVEL  
LBS/SQ YD (EQ): PHASE LEVEL  
LBS/SQ YD/MIN (EQ): PHASE LEVEL

## PHASE

SERIAL: 17  
TARGET NUMBER: 3  
PHASE NUMBER: 1  
TIME: 0545

----- TARGET DATA -----  
TARGET: VILLAGE OF CAGNY

TARGET AREA: 1940000  
PHASE TACTICS: ??

----- FIRING DATA -----  
FIRE UNIT: RAF BOMBER COMMAND/CORP ARTILLERY  
TYPE WEAPONS: AA, EE/??  
NUMBER TUBES: ??AA, ??EE/??  
TYPE AMMO: 70% NOSE INSTANTANEOUS, 30% M44 PISTOL AA&EE/??  
ROUNDS PER GUN: ??AA, ??EE/??  
NUMBER ROUNDS: 400AA, 1100EE/??  
FIRE DURATION: 45

----- RESULTS DATA -----  
ATTACK DELAY TIME: TARGET LEVEL  
TIME TO OBJECTIVE: TARGET LEVEL  
CASUALTIES: TARGET LEVEL  
EQUIPMENT DAMAGE: TARGET LEVEL  
OTHER FACTORS: TARGET LEVEL

OTHER RESULTS: TARGET LEVEL  
SUPPRESSION: TARGET LEVEL

----- CALCULATED DATA -----  
RDS/SQ YD: ??AA, ??EE/??  
RDS/SQ YD/MIN: ??AA, ??EE/??  
LBS/SQ YD: 0.32AA&EE/??  
LBS/SQ YD/MIN: ??AA, ??EE/??  
LBS/SQ YD (EQ): 0.25AA&EE/??  
LBS/SQ YD/MIN (EQ): ??AA, ??EE/??

## TARGET

SERIAL:	17
TARGET NUMBER:	4
NUMBER PHASES:	1
TIME:	0700
----- TARGET DATA -----	
TARGET:	PHASE LEVEL
TARGET AREA:	PHASE LEVEL
TARGET TACTICS:	AERIAL AND ARTILLERY BOMBARDMENT
----- FIRING DATA -----	
FIRE UNIT:	PHASE LEVEL
TYPE WEAPONS:	PHASE LEVEL
NUMBER TUBES:	PHASE LEVEL
TYPE AMMO:	PHASE LEVEL
ROUNDS PER GUN:	PHASE LEVEL
NUMBER ROUNDS:	PHASE LEVEL
FIRE DURATION:	45
----- RESULTS DATA -----	
ATTACK DELAY TIME:	45 MIN/5 HR/4 HR/??
TIME TO OBJECTIVE:	15 MIN/2 HR/??/??
CASUALTIES:	??/??/??/??
EQUIPMENT DAMAGE:	??/??/??/??
OTHER FACTORS:	DEFENDERS WERE AIR FORCE/CUT OFF BY ARMOR ADVANCE/??/NOT BOMBED
OTHER RESULTS:	??/SLIGHT RESISTANCE/SLIGHT RESISTANCE/RESISTED ALL DAY
SUPPRESSION:	NEUTRALIZED/??/??/??
----- CALCULATED DATA -----	
RDS/SQ YD:	PHASE LEVEL
RDS/SQ YD/MIN:	PHASE LEVEL
LBS/SQ YD:	PHASE LEVEL
LBS/SQ YD/MIN:	PHASE LEVEL
LBS/SQ YD (EQ):	PHASE LEVEL
LBS/SQ YD/MIN (EQ):	PHASE LEVEL

## PHASE

SERIAL:	17
TARGET NUMBER:	4
PHASE NUMBER:	1
TIME:	0700
----- TARGET DATA -----	
TARGET:	SEVERAL VILLAGES:CUVERVILLE/DEMOUVILLE/LIROSE/GIBERVILLE
TARGET AREA:	11330000
PHASE TACTICS:	??
----- FIRING DATA -----	
FIRE UNIT:	9USAAF/1ST AND 2ND SECTIONS 8 CORPS ARTY
TYPE WEAPONS:	AA,250 GP,260 FRAG BMS/??
NUMBER TUBES:	??AA,??,??/??
TYPE AMMO:	??AA,??,??/??
ROUNDS PER GUN:	??AA,??,??/??
NUMBER ROUNDS:	375AA,576,3505/??
FIRE DURATION:	45
----- RESULTS DATA -----	
ATTACK DELAY TIME:	TARGET LEVEL
TIME TO OBJECTIVE:	TARGET LEVEL
CASUALTIES:	TARGET LEVEL
EQUIPMENT DAMAGE:	TARGET LEVEL
OTHER FACTORS:	TARGET LEVEL
OTHER RESULTS:	TARGET LEVEL
SUPPRESSION:	TARGET LEVEL
----- CALCULATED DATA -----	
RDS/SQ YD:	??AA,??,??/??
RDS/SQ YD/MIN:	??AA,??,??/??
LBS/SQ YD:	0.126AA,0.120,0.052/??
LBS/SQ YD/MIN:	??AA,??,??/??
LBS/SQ YD (EQ):	0.12AA,0.12,0.03/??
LBS/SQ YD/MIN (EQ):	??AA,??,??/??

## TARGET

SERIAL:	17
TARGET NUMBER:	5
NUMBER PHASES:	1
TIME:	0830
----- TARGET DATA -----	
TARGET:	PHASE LEVEL
TARGET AREA:	PHASE LEVEL
TARGET TACTICS:	AERIAL AND ARTILLERY BOMBARDMENT
----- FIRING DATA -----	
FIRE UNIT:	PHASE LEVEL
TYPE WEAPONS:	PHASE LEVEL
NUMBER TUBES:	PHASE LEVEL
TYPE AMMO:	PHASE LEVEL
ROUNDS PER GUN:	PHASE LEVEL
NUMBER ROUNDS:	PHASE LEVEL
FIRE DURATION:	30
----- RESULTS DATA -----	
ATTACK DELAY TIME:	BYPASSED AT H+3 HRS/BYPASSED TIL 19 JUL/??
TIME TO OBJECTIVE:	??/??/??
CASUALTIES:	??/??/??
EQUIPMENT DAMAGE:	??/??/DEVASTATION
OTHER FACTORS:	LIGHTLY BOMBED/??/REINFORCED BY GERMANS
OTHER RESULTS:	SLIGHT RESISTANCE/STRONG RESISTANCE/??
SUPPRESSION:	??/??/??
----- CALCULATED DATA -----	
RDS/SQ YD:	PHASE LEVEL
RDS/SQ YD/MIN:	PHASE LEVEL
LBS/SQ YD:	PHASE LEVEL
LBS/SQ YD/MIN:	PHASE LEVEL
LBS/SQ YD (EQ):	PHASE LEVEL
LBS/SQ YD/MIN (EQ):	PHASE LEVEL

## PHASE

SERIAL:	17
TARGET NUMBER:	5
PHASE NUMBER:	1
TIME:	0830
----- TARGET DATA -----	
TARGET:	GRENTHEVILLE/SOLTERS/BOURGUEBUS
TARGET AREA:	14370000 (MAIN CONCENTRATION AREA)
PHASE TACTICS:	??
----- FIRING DATA -----	
FIRE UNIT:	8 USAAF/CORPS ARTILLERY
TYPE WEAPONS:	88,280 FRAG BOMBS/??
NUMBER TUBES:	??88,??/??
TYPE AMMO:	FUSED TAIL NO DELAY 88,??/??
ROUNDS PER GUN:	??88,??/??
NUMBER ROUNDS:	580088,54300/??
FIRE DURATION:	30
----- RESULTS DATA -----	
ATTACK DELAY TIME:	TARGET LEVEL
TIME TO OBJECTIVE:	TARGET LEVEL
CASUALTIES:	TARGET LEVEL
EQUIPMENT DAMAGE:	TARGET LEVEL
OTHER FACTORS:	TARGET LEVEL
OTHER RESULTS:	TARGET LEVEL
SUPPRESSION:	TARGET LEVEL
----- CALCULATED DATA -----	
RDS/SQ YD:	??88,??/??
RDS/SQ YD/MIN:	??88,??/??
LBS/SQ YD:	0.048888FRAG/??
LBS/SQ YD/MIN:	??88,??/??
LBS/SQ YD (EQ):	0.08888FRAG/??
LBS/SQ YD/MIN (EQ):	??88,??/??

## TARGET

SERIAL:	17
TARGET NUMBER:	6
NUMBER PHASES:	1
TIME:	0700
----- TARGET DATA -----	
TARGET:	PHASE LEVEL
TARGET AREA:	PHASE LEVEL
TARGET TACTICS:	AERIAL AND ARTILLERY BOMBARDMENT
----- FIRING DATA -----	
FIRE UNIT:	PHASE LEVEL
TYPE WEAPONS:	PHASE LEVEL
NUMBER TUBES:	PHASE LEVEL
TYPE AMMO:	PHASE LEVEL
ROUNDS PER GUN:	PHASE LEVEL
NUMBER ROUNDS:	PHASE LEVEL
FIRE DURATION:	45
----- RESULTS DATA -----	
ATTACK DELAY TIME:	??
TIME TO OBJECTIVE:	??
CASUALTIES:	??;??
EQUIPMENT DAMAGE:	??;??
OTHER FACTORS:	??
OTHER RESULTS:	TOWN RESISTED AND WAS NOT CAPTURED
SUPPRESSION:	??
----- CALCULATED DATA -----	
RDS/SQ YD:	PHASE LEVEL
RDS/SQ YD/MIN:	PHASE LEVEL
LBS/SQ YD:	PHASE LEVEL
LBS/SQ YD/MIN:	PHASE LEVEL
LBS/SQ YD (EQ):	PHASE LEVEL
LBS/SQ YD/MIN (EQ):	PHASE LEVEL

## PHASE

SERIAL:	17
TARGET NUMBER:	6
PHASE NUMBER:	1
TIME:	0700
----- TARGET DATA -----	
TARGET:	TROARN REGION
TARGET AREA:	8420000 (MAIN CONCENTRATION AREA)
PHASE TACTICS:	??
----- FIRING DATA -----	
FIRE UNIT:	8 USAAF/CORPS ARTILLERY
TYPE WEAPONS:	88,260 FRAG BOMBS/??
NUMBER TUBES:	??88,??/??
TYPE AMMO:	FUSED TAIL NO DELAY 88,??/??
ROUNDS PER GUN:	??88,??/??
NUMBER ROUNDS:	402088,23700/??
FIRE DURATION:	45
----- RESULTS DATA -----	
ATTACK DELAY TIME:	TARGET LEVEL
TIME TO OBJECTIVE:	TARGET LEVEL
CASUALTIES:	TARGET LEVEL
EQUIPMENT DAMAGE:	TARGET LEVEL
OTHER FACTORS:	TARGET LEVEL
OTHER RESULTS:	TARGET LEVEL
SUPPRESSION:	TARGET LEVEL
----- CALCULATED DATA -----	
RDS/SQ YD:	??88,??/??
RDS/SQ YD/MIN:	??88,??/??
LBS/SQ YD:	0.037888FRAG/??
LBS/SQ YD/MIN:	??88,??/??
LBS/SQ YD (EQ):	0.025888FRAG/??
LBS/SQ YD/MIN (EQ):	??88,??/??

## TARGET

SERIAL:	17
TARGET NUMBER:	7
NUMBER PHASES:	1
TIME:	0830
----- TARGET DATA -----	
TARGET:	PHASE LEVEL
TARGET AREA:	PHASE LEVEL
TARGET TACTICS:	AERIAL AND ARTILLERY BOMBARDMENT
----- FIRING DATA -----	
FIRE UNIT:	PHASE LEVEL
TYPE WEAPONS:	PHASE LEVEL
NUMBER TUBES:	PHASE LEVEL
TYPE AMMO:	PHASE LEVEL
ROUNDS PER GUN:	PHASE LEVEL
NUMBER ROUNDS:	PHASE LEVEL
FIRE DURATION:	30
----- RESULTS DATA -----	
ATTACK DELAY TIME:	??
TIME TO OBJECTIVE:	??
CASUALTIES:	??;??
EQUIPMENT DAMAGE:	??;??
OTHER FACTORS:	NOT OCCUPIED BY BRITISH TROOPS
OTHER RESULTS:	GERMAN GUNS REMAINED ACTIVE
SUPPRESSION:	??
----- CALCULATED DATA -----	
RDS/SQ YD:	PHASE LEVEL
RDS/SQ YD/MIN:	PHASE LEVEL
LBS/SQ YD:	PHASE LEVEL
LBS/SQ YD/MIN:	PHASE LEVEL
LBS/SQ YD (EQ):	PHASE LEVEL
LBS/SQ YD/MIN (EQ):	PHASE LEVEL

## PHASE

SERIAL:	17
TARGET NUMBER:	7
PHASE NUMBER:	1
TIME:	0830
----- TARGET DATA -----	
TARGET:	CONTAINED ENEMY GUN POSITIONS
TARGET AREA:	3630000 (MAIN CONCENTRATION AREA)
PHASE TACTICS:	??
----- FIRING DATA -----	
FIRE UNIT:	8 USAAF/CORPS ARTILLERY
TYPE WEAPONS:	88,280 FRAG BOMBS/??
NUMBER TUBES:	??88,??/??
TYPE AMMO:	FUSED TAIL NO DELAY 88,??/??
ROUNDS PER GUN:	??88,??/??
NUMBER ROUNDS:	312088,18500/??
FIRE DURATION:	30
----- RESULTS DATA -----	
ATTACK DELAY TIME:	TARGET LEVEL
TIME TO OBJECTIVE:	TARGET LEVEL
CASUALTIES:	TARGET LEVEL
EQUIPMENT DAMAGE:	TARGET LEVEL
OTHER FACTORS:	TARGET LEVEL
OTHER RESULTS:	TARGET LEVEL
SUPPRESSION:	TARGET LEVEL
----- CALCULATED DATA -----	
RDS/SQ YD:	??88,??/??
RDS/SQ YD/MIN:	??88,??/??
LBS/SQ YD:	0.10888FRAG/??
LBS/SQ YD/MIN:	??88,??/??
LBS/SQ YD (EQ):	0.18888FRAG/??
LBS/SQ YD/MIN (EQ):	??88,??/??

# SERIAL

SERIAL: 18  
REF NUMBER: ??  
ORIG REF: ??  
REF TITLE: DEVELOPMENT OF ARTILLERY TACTICS AND EQUIPMENT  
DATA SOURCE: ACTION REPORTS

----- SERIAL DATA -----

SIDE 1 COUNTRY: BRITAIN  
SIDE 1 UNITS: 2 FD REGT, 2 FD BATT, 1 MD REGT  
SIDE 1 POSTURE: ATTACKING  
SIDE 2 COUNTRY: ITALY  
SIDE 2 UNITS: ??  
SIDE 2 POSTURE: DEFENDING

DATE OF ACTION: 12/09/40  
COUNTRY: EGYPT  
REGION: SIDI BARRANI  
TERRAIN: ??  
WEATHER: ??  
TIME: 0715

SERIAL TACTICS: TANKS ATTACK FROM NORTH, INFANTRY ATTACK FROM EAST

NO. BMBRD TARGETS: 1  
NO. PHASES/TGT: 1

----- TARGET DATA -----

BOMBARD TARGET: PHASE LEVEL  
BOMBARD TGT AREA: PHASE LEVEL  
BOMBARD TACTICS: TARGET LEVEL

----- FIRING DATA -----

FIRE UNIT: PHASE LEVEL  
TYPE WEAPONS: PHASE LEVEL  
NUMBER TUBES: PHASE LEVEL  
TYPE AMMO: PHASE LEVEL  
ROUNDS PER GUN: PHASE LEVEL  
NUMBER ROUNDS: PHASE LEVEL  
FIRE DURATION: TARGET LEVEL AND PHASE LEVEL

----- RESULTS DATA -----

ATTACK DELAY TIME: NO DELAY  
TIME TO OBJECTIVE: 90 MINUTES FROM H HOUR  
CASUALTIES: UNKNOWN (ITALIAN);UNKNOWN (BRITISH)  
EQUIPMENT DAMAGE: ??;??  
OTHER FACTORS: SURPRISE ACHIEVED;ITALIANS DID NOT HAVE EFFECTIVE ANTI-TANK WEAPONS;  
ITAL MORALE MAY HAVE BEEN POOR  
OTHER RESULTS: ??  
SUPPRESSION: ITALIAN MORALE COLLAPSED

----- CALCULATED DATA -----

RDS/SQ YD: PHASE LEVEL  
RDS/SQ YD/MIN: PHASE LEVEL  
LBS/SQ YD: PHASE LEVEL  
LBS/SQ YD/MIN: PHASE LEVEL  
LBS/SQ YD (EQ): PHASE LEVEL  
LBS/SQ YD/MIN (EQ): PHASE LEVEL

## TARGET

SERIAL	10
TARGET NUMBER	1
NUMBER PHASES	1
TIME	0715
----- TARGET DATA -----	
TARGET	PHASE LEVEL
TARGET AREA	PHASE LEVEL
TARGET TACTICS	BOMBARD ITALIAN FORTIFIED CAMP
----- FIRING DATA -----	
FIRE UNIT	PHASE LEVEL
TYPE WEAPONS	PHASE LEVEL
NUMBER TUBES	PHASE LEVEL
TYPE AMMO	PHASE LEVEL
ROUNDS PER GUN	PHASE LEVEL
NUMBER ROUNDS	PHASE LEVEL
FIRE DURATION	20
----- RESULTS DATA -----	
ATTACK DELAY TIME	SERIAL LEVEL
TIME TO OBJECTIVE	SERIAL LEVEL
CASUALTIES	SERIAL LEVEL
EQUIPMENT DAMAGE	SERIAL LEVEL
OTHER FACTORS	SERIAL LEVEL
OTHER RESULTS	SERIAL LEVEL
SUPPRESSION	SERIAL LEVEL
----- CALCULATED DATA -----	
ROB/SQ YD	PHASE LEVEL
ROB/SQ YD/MIN	PHASE LEVEL
LBS/SQ YD	PHASE LEVEL
LBS/SQ YD/MIN	PHASE LEVEL
LBS/SQ YD (EQ)	PHASE LEVEL
LBS/SQ YD/MIN (EQ)	PHASE LEVEL

## PHASE

SERIAL	10
TARGET NUMBER	1
PHASE NUMBER	1
TIME	0715
----- TARGET DATA -----	
TARGET	ITALIAN FORTIFIED CAMP
TARGET AREA	4000000
PHASE TACTICS	CONCENTRATION
----- FIRING DATA -----	
FIRE UNIT	2 FD REGT, 2 FD BATT, 1 MO REGT
TYPE WEAPONS	A, B, G
NUMBER TUBES	80A, 80B, 80G
TYPE AMMO	HE A, HE B, HE G
ROUNDS PER GUN	80A, 80B, 80G
NUMBER ROUNDS	2800A, 400B, 400G
FIRE DURATION	20
----- RESULTS DATA -----	
ATTACK DELAY TIME	SERIAL LEVEL
TIME TO OBJECTIVE	SERIAL LEVEL
CASUALTIES	SERIAL LEVEL
EQUIPMENT DAMAGE	SERIAL LEVEL
OTHER FACTORS	SERIAL LEVEL
OTHER RESULTS	SERIAL LEVEL
SUPPRESSION	SERIAL LEVEL
----- CALCULATED DATA -----	
ROB/SQ YD	0.0007A, 0.0001B, 0.0001G
ROB/SQ YD/MIN	77A, 77B, 77G
LBS/SQ YD	0.0178A, 0.0088B, 0.014G
LBS/SQ YD/MIN	77A, 77B, 77G
LBS/SQ YD (EQ)	0.0178A, 0.00486B, 0.00884G
LBS/SQ YD/MIN (EQ)	77A, 77B, 77G

SERIAL

SERIAL: 19  
 REF NUMBER: ??  
 ORIG REF: ??  
 REF TITLE: DEVELOPMENT OF ARTILLERY TACTICS AND EQUIPMENT  
 DATA SOURCE: ACTION REPORTS

----- SERIAL DATA -----

SIDE 1 COUNTRY: BRITAIN  
 SIDE 1 UNITS: 2 FD REGT, 2 FD BATT, 1 MD REGT  
 SIDE 1 POSTURE: ATTACKING  
 SIDE 2 COUNTRY: ITALY  
 SIDE 2 UNITS: ??  
 SIDE 2 POSTURE: DEFENDING

DATE OF ACTION: 12/09/40  
 COUNTRY: EGYPT  
 REGION: SIDI BARRANI  
 TERRAIN: ??  
 WEATHER: ??  
 TIME: 1130

SERIAL TACTICS: ATTACK ITALIAN CAMP WITH TANKS AND INFANTRY

NO. BMBRD TARGETS: 1  
 NO. PHASES/TGT: 1

----- TARGET DATA -----

BOMBARD TARGET: PHASE LEVEL

BOMBARD TGT AKEA: PHASE LEVEL  
 BOMBARD TACTICS: TARGET LEVEL

----- FIRING DATA -----

FIRE UNIT: PHASE LEVEL  
 TYPE WEAPONS: PHASE LEVEL  
 NUMBER TUBES: PHASE LEVEL  
 TYPE AMMO: PHASE LEVEL  
 ROUNDS PER GUN: PHASE LEVEL  
 NUMBER ROUNDS: PHASE LEVEL  
 FIRE DURATION: TARGET LEVEL AND PHASE LEVEL

----- RESULTS DATA -----

ATTACK DELAY TIME: NO DELAY  
 TIME TO OBJECTIVE: 80 MINUTES FROM H HOUR  
 CASUALTIES: UNKNOWN (ITALIAN); UNKNOWN (BRITISH)  
 EQUIPMENT DAMAGE: ??; ??  
 OTHER FACTORS: ITALIANS DID NOT HAVE EFFECTIVE ANTI-TANK WEAPONS; ITALIAN MORALE MAY  
 HAVE BEEN POOR  
 OTHER RESULTS: ??  
 SUPPRESSION: ITALIAN MORALE COLLAPSED

----- CALCULATED DATA -----

RDS/SQ YD: PHASE LEVEL  
 RDS/SQ YD/MIN: PHASE LEVEL  
 LBS/SQ YD: PHASE LEVEL  
 LBS/SQ YD/MIN: PHASE LEVEL  
 LBS/SQ YD (EQ): PHASE LEVEL  
 LBS/SQ YD/MIN (EQ): PHASE LEVEL

## TARGET

SERIAL:	19
TARGET NUMBER:	1
NUMBER PHASES:	1
TIME:	1130
----- TARGET DATA -----	
TARGET:	PHASE LEVEL
TARGET AREA:	PHASE LEVEL
TARGET TACTICS:	BOMBARD ITALIAN FORTIFIED CAMP
----- FIRING DATA -----	
FIRE UNIT:	PHASE LEVEL
TYPE WEAPONS:	PHASE LEVEL
NUMBER TUBES:	PHASE LEVEL
TYPE AMMO:	PHASE LEVEL
ROUNDS PER GUN:	PHASE LEVEL
NUMBER ROUNDS:	PHASE LEVEL
FIRE DURATION:	20
----- RESULTS DATA -----	
ATTACK DELAY TIME:	SERIAL LEVEL
TIME TO OBJECTIVE:	SERIAL LEVEL
CASUALTIES:	SERIAL LEVEL
EQUIPMENT DAMAGE:	SERIAL LEVEL
OTHER FACTORS:	SERIAL LEVEL
OTHER RESULTS:	SERIAL LEVEL
SUPPRESSION:	SERIAL LEVEL
----- CALCULATED DATA -----	
RS/SQ YD:	PHASE LEVEL
RDS/SQ YD/MIN:	PHASE LEVEL
LBS/SQ YD:	PHASE LEVEL
LBS/SQ YD/MIN:	PHASE LEVEL
LBS/SQ YD (EQ):	PHASE LEVEL
LBS/SQ YD/MIN (EQ):	PHASE LEVEL

## PHASE

SERIAL:	19
TARGET NUMBER:	1
PHASE NUMBER:	1
TIME:	1130
----- TARGET DATA -----	
TARGET:	ITALIAN FORTIFIED CAMP
TARGET AREA:	3600000
PHASE TACTICS:	CONCENTRATION
----- FIRING DATA -----	
FIRE UNIT:	2 FD REGT, 2 FD BATT, 1 MO REGT
TYPE WEAPONS:	A, B, G
NUMBER TUBES:	58A, 50B, 50G
TYPE AMMO:	HE A, HE B, HE G
ROUNDS PER GUN:	50A, 8B, 8G
NUMBER ROUNDS:	2800A, 400B, 400G
FIRE DURATION:	20
----- RESULTS DATA -----	
ATTACK DELAY TIME:	SERIAL LEVEL
TIME TO OBJECTIVE:	SERIAL LEVEL
CASUALTIES:	SERIAL LEVEL
EQUIPMENT DAMAGE:	SERIAL LEVEL
OTHER FACTORS:	SERIAL LEVEL
OTHER RESULTS:	SERIAL LEVEL
SUPPRESSION:	SERIAL LEVEL
----- CALCULATED DATA -----	
RDS/SQ YD:	0.000778A, 0.000111B, 0.000111G
RDS/SQ YD/MIN:	77A, 77B, 77G
LBS/SQ YD:	0.0194A, 0.00688B, 0.0111G
LBS/SQ YD/MIN:	77A, 77B, 77G
LBS/SQ YD (EQ):	0.0194A, 0.00505B, 0.00615G
LBS/SQ YD/MIN (EQ):	77A, 77B, 77G

SERIAL

SERIAL: 20  
 REF NUMBER: A10  
 ORIG REF: IORS 1/25C1  
 REF TITLE: EFFECT OF ARTILLERY FIRE  
 DATA SOURCE: ACTION REPORT PLUS GROUND RECCE

----- SERIAL DATA -----

SIDE 1 COUNTRY: ??  
 SIDE 1 UNITS: ??  
 SIDE 1 POSTURE: ATTACKING  
 SIDE 2 COUNTRY: GERMANY  
 SIDE 2 UNITS: ??  
 SIDE 2 POSTURE: DEFENDING

DATE OF ACTION: 10/08/44  
 COUNTRY: ITALY  
 REGION: GOTHIC LINE  
 TERRAIN: CLIFF ON HILL TOP  
 WEATHER: ??  
 TIME: 1000

SERIAL TACTICS: ATTACK GERMAN POSITION ABOVE CLIFF ON HILL TOP

NO. BMBRD TARGETS: 1  
 NO. PHASES/TGT: 1

----- TARGET DATA -----

BOMBARD TARGET: PHASE LEVEL

BOMBARD TGT AREA: PHASE LEVEL  
 BOMBARD TACTICS: TARGET LEVEL

----- FIRING DATA -----

FIRE UNIT: PHASE LEVEL  
 TYPE WEAPONS: PHASE LEVEL  
 NUMBER TUBES: PHASE LEVEL  
 TYPE AMMO: PHASE LEVEL  
 ROUNDS PER GUN: PHASE LEVEL  
 NUMBER ROUNDS: PHASE LEVEL  
 FIRE DURATION: TARGET LEVEL AND PHASE LEVEL

----- RESULTS DATA -----

ATTACK DELAY TIME: 2 HOURS  
 TIME TO OBJECTIVE: ??  
 CASUALTIES: 23 KIA, 12 WIA, 2 POW (GERMAN);?? (SIDE 1)  
 EQUIPMENT DAMAGE: ??;??  
 OTHER FACTORS: NONE

OTHER RESULTS: GERMANS WITHDREW WITHOUT ORDERS  
 SUPPRESSION: A 7 HOUR BOMBARDMENT OF A POSITION WITH POOR DEFENSES NEUTRALIZED THE GERMANS

----- CALCULATED DATA -----

RDS/SQ YD: PHASE LEVEL  
 RDS/SQ YD/MIN: PHASE LEVEL  
 LBS/SQ YD: PHASE LEVEL  
 LBS/SQ YD/MIN: PHASE LEVEL  
 LBS/SQ YD (EQ): PHASE LEVEL  
 LBS/SQ YD/MIN (EQ): PHASE LEVEL

## TARGET

SERIAL: 20  
TARGET NUMBER: 1  
NUMBER PHASES: 1  
TIME: 1000  
----- TARGET DATA -----  
TARGET: PHASE LEVEL  
  
TARGET AREA: PHASE LEVEL  
TARGET TACTICS: BOMBARD GERMAN POSITION  
  
----- FIRING DATA -----  
FIRE UNIT: PHASE LEVEL  
TYPE WEAPONS: PHASE LEVEL  
NUMBER TUBES: PHASE LEVEL  
TYPE AMMO: PHASE LEVEL  
ROUNDS PER GUN: PHASE LEVEL  
NUMBER ROUNDS: PHASE LEVEL  
FIRE DURATION: 420  
  
----- RESULTS DATA -----  
ATTACK DELAY TIME: SERIAL LEVEL  
TIME TO OBJECTIVE: SERIAL LEVEL  
CASUALTIES: SERIAL LEVEL  
EQUIPMENT DAMAGE: SERIAL LEVEL  
OTHER FACTORS: SERIAL LEVEL  
  
OTHER RESULTS: SERIAL LEVEL  
SUPPRESSION: SERIAL LEVEL  
  
----- CALCULATED DATA -----  
RDS/SQ YD: PHASE LEVEL  
RDS/SQ YD/MIN: PHASE LEVEL  
LBS/SQ YD: PHASE LEVEL  
LBS/SQ YD/MIN: PHASE LEVEL  
LBS/SQ YD (EQ): PHASE LEVEL  
LBS/SQ YD/MIN (EQ): PHASE LEVEL

## PHASE

SERIAL: 20  
TARGET NUMBER: 1  
PHASE NUMBER: 1  
TIME: 1000  
----- TARGET DATA -----  
TARGET: GERMAN POSITION ABOVE CLIFF ON HILL TOP  
  
TARGET AREA: 40000  
PHASE TACTICS: CONCENTRATION  
  
----- FIRING DATA -----  
FIRE UNIT: 2 FD GUNS  
TYPE WEAPONS: A  
NUMBER TUBES: 2A  
TYPE AMMO: ?? A  
ROUNDS PER GUN: 70A  
NUMBER ROUNDS: 140A  
FIRE DURATION: 420  
  
----- RESULTS DATA -----  
ATTACK DELAY TIME: SERIAL LEVEL  
TIME TO OBJECTIVE: SERIAL LEVEL  
CASUALTIES: SERIAL LEVEL  
EQUIPMENT DAMAGE: SERIAL LEVEL  
OTHER FACTORS: SERIAL LEVEL  
  
OTHER RESULTS: SERIAL LEVEL  
SUPPRESSION: SERIAL LEVEL  
  
----- CALCULATED DATA -----  
RDS/SQ YD: 0.0035A  
RDS/SQ YD/MIN: ??A  
LBS/SQ YD: 0.0075A  
LBS/SQ YD/MIN: ??A  
LBS/SQ YD (EQ): 0.0075A  
LBS/SQ YD/MIN (EQ): ??A

## SERIAL

SERIAL: 21  
 REF NUMBER: A10  
 ORIG REF: 10RS 1/25C2  
 REF TITLE: EFFECT OF ARTILLERY FIRE  
 DATA SOURCE: ACTION REPORT

----- SERIAL DATA -----

SIDE 1 COUNTRY: BRITAIN  
 SIDE 1 UNITS: ??  
 SIDE 1 POSTURE: ATTACKING  
 SIDE 2 COUNTRY: GERMANY  
 SIDE 2 UNITS: ??  
 SIDE 2 POSTURE: DEFENDING

DATE OF ACTION: JULY 1944  
 COUNTRY: ITALY  
 REGION: MELETO  
 TERRAIN: HILL  
 WEATHER: ??  
 TIME: ??

SERIAL TACTICS: INFANTRY ATTACK GERMAN MG POST 10 MINUTES AFTER ARTILLERY BOMBARDMEN  
 T  
 NO. BMBRD TARGETS: 1  
 NO. PHASES/TGT: 1

----- TARGET DATA -----

BOMBARD TARGET: PHASE LEVEL  
 BOMBARD TGT AREA: PHASE LEVEL  
 BOMBARD TACTICS: TARGET LEVEL

----- FIRING DATA -----

FIRE UNIT: PHASE LEVEL  
 TYPE WEAPONS: PHASE LEVEL  
 NUMBER TUBES: PHASE LEVEL  
 TYPE AMMO: PHASE LEVEL  
 ROUNDS PER GUN: PHASE LEVEL  
 NUMBER ROUNDS: PHASE LEVEL  
 FIRE DURATION: TARGET LEVEL AND PHASE LEVEL

----- RESULTS DATA -----

ATTACK DELAY TIME: 10 MINUTES  
 TIME TO OBJECTIVE: ??  
 CASUALTIES: NONE (GERMAN);?? (BRITISH)  
 EQUIPMENT DAMAGE: NONE (GERMAN);?? (BRITISH)  
 OTHER FACTORS: NONE

OTHER RESULTS: NO RESISTANCE  
 SUPPRESSION: GERMANS WERE NEUTRALIZED;MOST POWS WERE DESCRIBED AS "BOMB HAPPY"

----- CALCULATED DATA -----

RDS/SQ YD: PHASE LEVEL  
 RDS/SQ YD/MIN: PHASE LEVEL  
 LBS/SQ YD: PHASE LEVEL  
 LBS/SQ YD/MIN: PHASE LEVEL  
 LBS/SQ YD (EQ): PHASE LEVEL  
 LBS/SQ YD/MIN (EQ): PHASE LEVEL

## TARGET

SERIAL: 21  
TARGET NUMBER: 1  
NUMBER PHASES: 1  
TIME: ??

----- TARGET DATA -----  
TARGET: PHASE LEVEL

TARGET AREA: PHASE LEVEL  
TARGET TACTICS: BOMBARD GERMAN MG POST ON HILL

----- FIRING DATA -----  
FIRE UNIT: PHASE LEVEL  
TYPE WEAPONS: PHASE LEVEL  
NUMBER TUBES: PHASE LEVEL  
TYPE AMMO: PHASE LEVEL  
ROUNDS PER GUN: PHASE LEVEL  
NUMBER ROUNDS: PHASE LEVEL  
FIRE DURATION: 45

----- RESULTS DATA -----  
ATTACK DELAY TIME: SERIAL LEVEL  
TIME TO OBJECTIVE: SERIAL LEVEL  
CASUALTIES: SERIAL LEVEL  
EQUIPMENT DAMAGE: SERIAL LEVEL  
OTHER FACTORS: SERIAL LEVEL

OTHER RESULTS: SERIAL LEVEL  
SUPPRESSION: SERIAL LEVEL

----- CALCULATED DATA -----  
RDS/SQ YD: PHASE LEVEL  
RDS/SQ YD/MIN: PHASE LEVEL  
LBS/SQ YD: PHASE LEVEL  
LBS/SQ YD/MIN: PHASE LEVEL  
LBS/SQ YD (EQ): PHASE LEVEL  
LBS/SQ YD/MIN (EQ): PHASE LEVEL

## PHASE

SERIAL: 21  
TARGET NUMBER: 1  
PHASE NUMBER: 1  
TIME: ??

----- TARGET DATA -----  
TARGET: GERMAN MG POST ON HILL

TARGET AREA: 2500  
PHASE TACTICS: CONCENTRATION

----- FIRING DATA -----  
FIRE UNIT: ??  
TYPE WEAPONS: F  
NUMBER TUBES: 1F  
TYPE AMMO: HE119 F  
ROUNDS PER GUN: 50F  
NUMBER ROUNDS: 50F  
FIRE DURATION: 45

----- RESULTS DATA -----  
ATTACK DELAY TIME: SERIAL LEVEL  
TIME TO OBJECTIVE: SERIAL LEVEL  
CASUALTIES: SERIAL LEVEL  
EQUIPMENT DAMAGE: SERIAL LEVEL  
OTHER FACTORS: SERIAL LEVEL

OTHER RESULTS: SERIAL LEVEL  
SUPPRESSION: SERIAL LEVEL

----- CALCULATED DATA -----  
RDS/SQ YD: 0.02F  
RDS/SQ YD/MIN: ??F  
LBS/SQ YD: 1.6F  
LBS/SQ YD/MIN: ??F  
LBS/SQ YD (EQ): 1.33F  
LBS/SQ YD/MIN (EQ): ??F

## SERIAL

SERIAL: 22  
REF NUMBER: A10  
ORIG REF: 1ORS 1/25C3  
REF TITLE: EFFECT OF ARTILLERY FIRE  
DATA SOURCE: ACTION REPORT

### ----- SERIAL DATA -----

SIDE 1 COUNTRY: BRITAIN  
SIDE 1 UNITS: 2 FD REGT  
SIDE 1 POSTURE: ATTACKING  
SIDE 2 COUNTRY: GERMANY  
SIDE 2 UNITS: ??  
SIDE 2 POSTURE: DEFENDING

DATE OF ACTION: 10/15/44  
COUNTRY: ITALY  
REGION: FONTANELICE  
TERRAIN: MOUNTAINOUS  
WEATHER: ??  
TIME: ??

SERIAL TACTICS: INFANTRY ATTACK SUPPORTED BY ARTILLERY BOMBARDMENT

NO. BMBRD TARGETS: 1  
NO. PHASES/TGT: 6

### ----- TARGET DATA -----

BOMBARD TARGET: TARGET LEVEL

BOMBARD TGT AREA: TARGET LEVEL  
BOMBARD TACTICS: TARGET LEVEL

### ----- FIRING DATA -----

FIRE UNIT: PHASE LEVEL  
TYPE WEAPONS: PHASE LEVEL  
NUMBER TUBES: PHASE LEVEL  
TYPE AMMO: PHASE LEVEL  
ROUNDS PER GUN: PHASE LEVEL  
NUMBER ROUNDS: PHASE LEVEL  
FIRE DURATION: TARGET LEVEL AND PHASE LEVEL

### ----- RESULTS DATA -----

ATTACK DELAY TIME: ??  
TIME TO OBJECTIVE: ATTACK FAILED  
CASUALTIES: UNKNOWN (GERMAN); UNKNOWN (BRITISH)  
EQUIPMENT DAMAGE: ??; ??  
OTHER FACTORS: HOSTILE MGS FIRED DURING AND AFTER BARRAGE; PATTERN OF ARTILLERY FIRE  
WAS UNSUITABLE  
OTHER RESULTS: NONE  
SUPPRESSION: GERMANS WERE NOT NEUTRALIZED

### ----- CALCULATED DATA -----

RDS/SQ YD: TARGET LEVEL  
RDS/SQ YD/MIN: TARGET LEVEL  
LBS/SQ YD: TARGET LEVEL  
LBS/SQ YD/MIN: TARGET LEVEL  
LBS/SQ YD (EQ): TARGET LEVEL  
LBS/SQ YD/MIN (EQ): TARGET LEVEL

## TARGET

SERIAL: 22  
TARGET NUMBER: 1  
NUMBER PHASES: 6  
TIME: ??

----- TARGET DATA -----  
TARGET: WEAPON PITS ON AND AT FOOT OF HILLOCK

TARGET AREA: 840000  
TARGET TACTICS: BOMBARD WEAPON PITS

----- FIRING DATA -----  
FIRE UNIT: PHASE LEVEL  
TYPE WEAPONS: PHASE LEVEL  
NUMBER TUBES: PHASE LEVEL  
TYPE AMMO: PHASE LEVEL  
ROUNDS PER GUN: PHASE LEVEL  
NUMBER ROUNDS: PHASE LEVEL  
FIRE DURATION: 76

----- RESULTS DATA -----  
ATTACK DELAY TIME: SERIAL LEVEL  
TIME TO OBJECTIVE: SERIAL LEVEL  
CASUALTIES: SERIAL LEVEL  
EQUIPMENT DAMAGE: SERIAL LEVEL  
OTHER FACTORS: SERIAL LEVEL

OTHER RESULTS: SERIAL LEVEL  
SUPPRESSION: SERIAL LEVEL

----- CALCULATED DATA -----  
RDS/SQ YD: 0.0052A  
RDS/SQ YD/MIN: ??A  
LBS/SQ YD: 0.13A  
LBS/SQ YD/MIN: ??A  
LBS/SQ YD (EQ): 0.13A  
LBS/SQ YD/MIN (EQ): ??A

## PHASE

SERIAL: 22  
TARGET NUMBER: 1  
PHASE NUMBER: 1  
TIME: H

----- TARGET DATA -----  
TARGET: TARGET LEVEL

TARGET AREA: TARGET LEVEL  
PHASE TACTICS: BARRAGE

----- FIRING DATA -----  
FIRE UNIT: 2 FD REGT  
TYPE WEAPONS: A  
NUMBER TUBES: 48A  
TYPE AMMO: ??A  
ROUNDS PER GUN: 7.5A  
NUMBER ROUNDS: 360A  
FIRE DURATION: 5

----- RESULTS DATA -----  
ATTACK DELAY TIME: SERIAL LEVEL  
TIME TO OBJECTIVE: SERIAL LEVEL  
CASUALTIES: SERIAL LEVEL  
EQUIPMENT DAMAGE: SERIAL LEVEL  
OTHER FACTORS: SERIAL LEVEL

OTHER RESULTS: SERIAL LEVEL  
SUPPRESSION: SERIAL LEVEL

----- CALCULATED DATA -----  
RDS/SQ YD: TARGET LEVEL  
RDS/SQ YD/MIN: TARGET LEVEL  
LBS/SQ YD: TARGET LEVEL  
LBS/SQ YD/MIN: TARGET LEVEL  
LBS/SQ YD (EQ): TARGET LEVEL  
LBS/SQ YD/MIN (EQ): TARGET LEVEL

## PHASE

SERIAL:	22
TARGET NUMBER:	1
PHASE NUMBER:	2
TIME:	H+5
----- TARGET DATA -----	
TARGET:	TARGET LEVEL
TARGET AREA:	TARGET LEVEL
PHASE TACTICS:	BARRAGE
----- FIRING DATA -----	
FIRE UNIT:	2 FD REGT
TYPE WEAPONS:	A
NUMBER TUBES:	48A
TYPE AMMO:	??A
ROUNDS PER GUN:	18A
NUMBER ROUNDS:	864A
FIRE DURATION:	12
----- RESULTS DATA -----	
ATTACK DELAY TIME:	SERIAL LEVEL
TIME TO OBJECTIVE:	SERIAL LEVEL
CASUALTIES:	SERIAL LEVEL
EQUIPMENT DAMAGE:	SERIAL LEVEL
OTHER FACTORS:	SERIAL LEVEL
OTHER RESULTS:	SERIAL LEVEL
SUPPRESSION:	SERIAL LEVEL
----- CALCULATED DATA -----	
RDS/SQ YD:	TARGET LEVEL
RDS/SQ YD/MIN:	TARGET LEVEL
LBS/SQ YD:	TARGET LEVEL
LBS/SQ YD/MIN:	TARGET LEVEL
LBS/SQ YD (EQ):	TARGET LEVEL
LBS/SQ YD/MIN (EQ):	TARGET LEVEL

## PHASE

SERIAL:	22
TARGET NUMBER:	1
PHASE NUMBER:	3
TIME:	H+17
----- TARGET DATA -----	
TARGET:	TARGET LEVEL
TARGET AREA:	TARGET LEVEL
PHASE TACTICS:	BARRAGE
----- FIRING DATA -----	
FIRE UNIT:	2 FD REGT
TYPE WEAPONS:	A
NUMBER TUBES:	48A
TYPE AMMO:	??A
ROUNDS PER GUN:	18A
NUMBER ROUNDS:	864A
FIRE DURATION:	12
----- RESULTS DATA -----	
ATTACK DELAY TIME:	SERIAL LEVEL
TIME TO OBJECTIVE:	SERIAL LEVEL
CASUALTIES:	SERIAL LEVEL
EQUIPMENT DAMAGE:	SERIAL LEVEL
OTHER FACTORS:	SERIAL LEVEL
OTHER RESULTS:	SERIAL LEVEL
SUPPRESSION:	SERIAL LEVEL
----- CALCULATED DATA -----	
RDS/SQ YD:	TARGET LEVEL
RDS/SQ YD/MIN:	TARGET LEVEL
LBS/SQ YD:	TARGET LEVEL
LBS/SQ YD/MIN:	TARGET LEVEL
LBS/SQ YD (EQ):	TARGET LEVEL
LBS/SQ YD/MIN (EQ):	TARGET LEVEL

## PHASE

```

SERIAL:          22
TARGET NUMBER:   1
PHASE NUMBER:    4
TIME:            H+29
----- TARGET DATA -----
TARGET:          TARGET LEVEL

TARGET AREA:     TARGET LEVEL
PHASE TACTICS:   BARRAGE

----- FIRING DATA -----
FIRE UNIT:       2 FD REGT
TYPE WEAPONS:    A
NUMBER TUBES:    48A
TYPE AMMO:       ??A
ROUNDS PER GUN: 18A
NUMBER ROUNDS:   864A
FIRE DURATION:   12

----- RESULTS DATA -----
ATTACK DELAY TIME: SERIAL LEVEL
TIME TO OBJECTIVE: SERIAL LEVEL
CASUALTIES:       SERIAL LEVEL
EQUIPMENT DAMAGE: SERIAL LEVEL
OTHER FACTORS:    SERIAL LEVEL

OTHER RESULTS:   SERIAL LEVEL
SUPPRESSION:     SERIAL LEVEL

----- CALCULATED DATA -----
RDS/SQ YD:       TARGET LEVEL
RDS/SQ YD/MIN:   TARGET LEVEL
LBS/SQ YD:       TARGET LEVEL
LBS/SQ YD/MIN:   TARGET LEVEL
LBS/SQ YD (EQ): TARGET LEVEL
LBS/SQ YD/MIN (EQ): TARGET LEVEL
  
```

## PHASE

```

SERIAL:          22
TARGET NUMBER:   1
PHASE NUMBER:    5
TIME:            H+41
----- TARGET DATA -----
TARGET:          TARGET LEVEL

TARGET AREA:     TARGET LEVEL
PHASE TACTICS:   BARRAGE

----- FIRING DATA -----
FIRE UNIT:       2 FD REGT
TYPE WEAPONS:    A
NUMBER TUBES:    48A
TYPE AMMO:       ??A
ROUNDS PER GUN: 18A
NUMBER ROUNDS:   720A
FIRE DURATION:   10

----- RESULTS DATA -----
ATTACK DELAY TIME: SERIAL LEVEL
TIME TO OBJECTIVE: SERIAL LEVEL
CASUALTIES:       SERIAL LEVEL
EQUIPMENT DAMAGE: SERIAL LEVEL
OTHER FACTORS:    SERIAL LEVEL

OTHER RESULTS:   SERIAL LEVEL
SUPPRESSION:     SERIAL LEVEL

----- CALCULATED DATA -----
RDS/SQ YD:       TARGET LEVEL
RDS/SQ YD/MIN:   TARGET LEVEL
LBS/SQ YD:       TARGET LEVEL
LBS/SQ YD/MIN:   TARGET LEVEL
LBS/SQ YD (EQ): TARGET LEVEL
LBS/SQ YD/MIN (EQ): TARGET LEVEL
  
```

# PHASE

SERIAL:	32
TARGET NUMBER:	1
PHASE NUMBER:	6
TIME:	H+66
----- TARGET DATA -----	
TARGET:	TARGET LEVEL
TARGET AREA:	TARGET LEVEL
PHASE TACTICS:	BARRAGE
----- FIRING DATA -----	
FIRE UNIT:	2 FD REGT
TYPE WEAPONS:	A
NUMBER TUBES:	48A
TYPE AMMO:	??A
ROUNDS PER GUN:	16A
NUMBER ROUNDS:	720A
FIRE DURATION:	10
----- RESULTS DATA -----	
ATTACK DELAY TIME:	SERIAL LEVEL
TIME TO OBJECTIVE:	SERIAL LEVEL
CASUALTIES:	SERIAL LEVEL
EQUIPMENT DAMAGE:	SERIAL LEVEL
OTHER FACTORS:	SERIAL LEVEL
OTHER RESULTS:	SERIAL LEVEL
SUPPRESSION:	SERIAL LEVEL
----- CALCULATED DATA -----	
RDS/SQ YD:	TARGET LEVEL
RDS/SQ YD/MIN:	TARGET LEVEL
LBS/SQ YD:	TARGET LEVEL
LBS/SQ YD/MIN:	TARGET LEVEL
LBS/SQ YD (EQ):	TARGET LEVEL
LBS/SQ YD/MIN (EQ):	TARGET LEVEL



## SERIAL

SERIAL: 23  
 REF NUMBER: A10  
 ORIG REF: 1ORS 1/25C4  
 REF TITLE: EFFECT OF ARTILLERY FIRE  
 DATA SOURCE: ACTION REPORT

### ----- SERIAL DATA -----

SIDE 1 COUNTRY: BRITAIN  
 SIDE 1 UNITS: ??  
 SIDE 1 POSTURE: ATTACKING  
 SIDE 2 COUNTRY: GERMANY  
 SIDE 2 UNITS: ??  
 SIDE 2 POSTURE: DEFENDING

DATE OF ACTION: 10/19/44  
 COUNTRY: ITALY  
 REGION: FONTANELICE  
 TERRAIN: MOUNTAINOUS  
 WEATHER: ??  
 TIME: 0100

SERIAL TACTICS: ??

NO. BMBRD TARGETS: ??  
 NO. PHASES/TGT: ??

### ----- TARGET DATA -----

BOMBARD TARGET: GERMAN WEAPON PITS  
 BOMBARD TGT AREA: ??  
 BOMBARD TACTICS: BOMBARD GERMAN WEAPON PITS

### ----- FIRING DATA -----

FIRE UNIT: ??  
 TYPE WEAPONS: ??  
 NUMBER TUBES: ??  
 TYPE AMMO: ??  
 ROUNDS PER GUN: ??  
 NUMBER ROUNDS: ??  
 FIRE DURATION: ??

### ----- RESULTS DATA -----

ATTACK DELAY TIME: ??  
 TIME TO OBJECTIVE: ??  
 CASUALTIES: ?? (GERMAN); 2 KIA, 4 WIA (BRITISH)  
 EQUIPMENT DAMAGE: ??; ??  
 OTHER FACTORS: GERMANS HAD EVACUATED POSITION ON EVENING OF 18TH  
 OTHER RESULTS: ALLIED CASUALTIES WERE CAUSED BY ALLIED SHELLS  
 SUPPRESSION: N/A

### ----- CALCULATED DATA -----

RDS/SQ YD: ??  
 RDS/SQ YD/MIN: ??  
 LBS/SQ YD: ??  
 LBS/SQ YD/MIN: ??  
 LBS/SQ YD (EQ): ??  
 LBS/SQ YD/MIN (EQ): ??



SERIAL

SERIAL: 24  
 REF NUMBER: A10  
 ORIG REF: 10RS 1/25C5  
 REF TITLE: THE EFFECT OF ARTILLERY FIRE  
 DATA SOURCE: ACTION REPORTS

----- SERIAL DATA -----

SIDE 1 COUNTRY: BRITAIN  
 SIDE 1 UNITS: 2 COYS, 1 FD REGT, 1 MD BATT  
 SIDE 1 POSTURE: ATTACKING  
 SIDE 2 COUNTRY: GERMANY  
 SIDE 2 UNITS: ??  
 SIDE 2 POSTURE: DEFENDING

DATE OF ACTION: 10/19/44  
 COUNTRY: ITALY  
 REGION: FONTANELICE  
 TERRAIN: MOUNTAINOUS  
 WEATHER: ??  
 TIME: 1900

SERIAL TACTICS: ATTACK 3 OBJECTIVES AND EXPLOIT; INFANTRY FOLLOW-UP BOMBARDMENT CLOSE  
 LY

NO. BMBRD TARGETS: 4  
 NO. PHASES/TGT: 2/2/4/1

----- TARGET DATA -----

BOMBARD TARGET: TARGET/TARGET/TARGET/PHASE

BOMBARD TGT AREA: TARGET/TARGET/TARGET/PHASE  
 BOMBARD TACTICS: TARGET LEVEL

----- FIRING DATA -----

FIRE UNIT: PHASE LEVEL  
 TYPE WEAPONS: PHASE LEVEL  
 NUMBER TUBES: PHASE LEVEL  
 TYPE AMMO: PHASE LEVEL  
 ROUNDS PER GUN: PHASE LEVEL  
 NUMBER ROUNDS: PHASE LEVEL  
 FIRE DURATION: TARGET LEVEL AND PHASE LEVEL

----- RESULTS DATA -----

ATTACK DELAY TIME: ??  
 TIME TO OBJECTIVE: ??  
 CASUALTIES: 31 POW (GERMAN); ?? (BRITISH)  
 EQUIPMENT DAMAGE: ??; ??  
 OTHER FACTORS: NONE

OTHER RESULTS: ALL 3 OBJECTIVES WERE TAKEN  
 SUPPRESSION: ??

----- CALCULATED DATA -----

RDS/SQ YD: TARGET/TARGET/TARGET/PHASE  
 RDS/SQ YD/MIN: TARGET/TARGET/TARGET/PHASE  
 LBS/SQ YD: TARGET/TARGET/TARGET/PHASE  
 LBS/SQ YD/MIN: TARGET/TARGET/TARGET/PHASE  
 LBS/SQ YD (EQ): TARGET/TARGET/TARGET/PHASE  
 LBS/SQ YD/MIN (EQ): TARGET/TARGET/TARGET/PHASE

## TARGET

SERIAL:	24
TARGET NUMBER:	1
NUMBER PHASES:	2
TIME:	1900
----- TARGET DATA -----	
TARGET:	TRACK JUNCTION
TARGET AREA:	56000
TARGET TACTICS:	BOMBARD TRACK JUNCTION
----- FIRING DATA -----	
FIRE UNIT:	PHASE LEVEL
TYPE WEAPONS:	PHASE LEVEL
NUMBER TUBES:	PHASE LEVEL
TYPE AMMO:	PHASE LEVEL
ROUNDS PER GUN:	PHASE LEVEL
NUMBER ROUNDS:	PHASE LEVEL
FIRE DURATION:	15
----- RESULTS DATA -----	
ATTACK DELAY TIME:	SERIAL LEVEL
TIME TO OBJECTIVE:	SERIAL LEVEL
CASUALTIES:	SERIAL LEVEL
EQUIPMENT DAMAGE:	SERIAL LEVEL
OTHER FACTORS:	SERIAL LEVEL
OTHER RESULTS:	SERIAL LEVEL
SUPPRESSION:	SERIAL LEVEL
----- CALCULATED DATA -----	
RDS/SQ YD:	0.0129A,0.00214F
RDS/SQ YD/MIN:	??A,??F
LBS/SQ YD:	0.321A,0.171F
LBS/SQ YD/MIN:	??A,??F
LBS/SQ YD (EQ):	0.321A,0.142F
LBS/SQ YD/MIN (EQ):	??A,??F

## PHASE

SERIAL:	24
TARGET NUMBER:	1
PHASE NUMBER:	1
TIME:	1900
----- TARGET DATA -----	
TARGET:	TARGET LEVEL
TARGET AREA:	TARGET LEVEL
PHASE TACTICS:	CONCENTRATION
----- FIRING DATA -----	
FIRE UNIT:	1 FD REGT, 1 MD BATT
TYPE WEAPONS:	A,F
NUMBER TUBES:	24A,8F
TYPE AMMO:	??A,??F
ROUNDS PER GUN:	20A,10F
NUMBER ROUNDS:	480A,80F
FIRE DURATION:	10
----- RESULTS DATA -----	
ATTACK DELAY TIME:	SERIAL LEVEL
TIME TO OBJECTIVE:	SERIAL LEVEL
CASUALTIES:	SERIAL LEVEL
EQUIPMENT DAMAGE:	SERIAL LEVEL
OTHER FACTORS:	SERIAL LEVEL
OTHER RESULTS:	SERIAL LEVEL
SUPPRESSION:	SERIAL LEVEL
----- CALCULATED DATA -----	
RDS/SQ YD:	TARGET LEVEL
RDS/SQ YD/MIN:	TARGET LEVEL
LBS/SQ YD:	TARGET LEVEL
LBS/SQ YD/MIN:	TARGET LEVEL
LBS/SQ YD (EQ):	TARGET LEVEL
LBS/SQ YD/MIN (EQ):	TARGET LEVEL

## PHASE

SERIAL:	24
TARGET NUMBER:	1
PHASE NUMBER:	2
TIME:	1920
----- TARGET DATA -----	
TARGET:	TARGET LEVEL
TARGET AREA:	TARGET LEVEL
PHASE TACTICS:	CONCENTRATION
----- FIRING DATA -----	
FIRE UNIT:	1 FO REGT, 1 MO BATT
TYPE WEAPONS:	A, F
NUMBER TUBES:	24A, 8F
TYPE AMMO:	??A, ??F
ROUNDS PER GUN:	10A, 5F
NUMBER ROUNDS:	240A, 40F
FIRE DURATION:	5
----- RESULTS DATA -----	
ATTACK DELAY TIME:	SERIAL LEVEL
TIME TO OBJECTIVE:	SERIAL LEVEL
CASUALTIES:	SERIAL LEVEL
EQUIPMENT DAMAGE:	SERIAL LEVEL
OTHER FACTORS:	SERIAL LEVEL
OTHER RESULTS:	SERIAL LEVEL
SUPPRESSION:	SERIAL LEVEL
----- CALCULATED DATA -----	
RDS/SQ YD:	TARGET LEVEL
RDS/SQ YD/MIN:	TARGET LEVEL
LBS/SQ YD:	TARGET LEVEL
LBS/SQ YD/MIN:	TARGET LEVEL
LBS/SQ YD (EQ):	TARGET LEVEL
LBS/SQ YD/MIN (EQ):	TARGET LEVEL

## TARGET

SERIAL:	24
TARGET NUMBER:	2
NUMBER PHASES:	2
TIME:	1935
----- TARGET DATA -----	
TARGET:	PT382
TARGET AREA:	56000
TARGET TACTICS:	BOMBARD PT382
----- FIRING DATA -----	
FIRE UNIT:	PHASE LEVEL
TYPE WEAPONS:	PHASE LEVEL
NUMBER TUBES:	PHASE LEVEL
TYPE AMMO:	PHASE LEVEL
ROUNDS PER GUN:	PHASE LEVEL
NUMBER ROUNDS:	PHASE LEVEL
FIRE DURATION:	25
----- RESULTS DATA -----	
ATTACK DELAY TIME:	SERIAL LEVEL
TIME TO OBJECTIVE:	SERIAL LEVEL
CASUALTIES:	SERIAL LEVEL
EQUIPMENT DAMAGE:	SERIAL LEVEL
OTHER FACTORS:	SERIAL LEVEL
OTHER RESULTS:	SERIAL LEVEL
SUPPRESSION:	SERIAL LEVEL
----- CALCULATED DATA -----	
RDS/SQ YD:	0.00643A, 0.00107F
RDS/SQ YD/MIN:	??A, ??F
LBS/SQ YD:	0.181A, 0.0857F
LBS/SQ YD/MIN:	??A, ??F
LBS/SQ YD (EQ):	0.181A, 0.0711F
LBS/SQ YD/MIN (EQ):	??A, ??F

## PHASE

SERIAL:	24
TARGET NUMBER:	2
PHASE NUMBER:	1
TIME:	1935
----- TARGET DATA -----	
TARGET:	TARGET LEVEL
TARGET AREA:	TARGET LEVEL
PHASE TACTICS:	CONCENTRATION
----- FIRING DATA -----	
FIRE UNIT:	1 FD REGT, 1 MD BATT
TYPE WEAPONS:	A, F
NUMBER TUBES:	24A, 8F
TYPE AMMO:	??A, ??F
ROUNDS PER GUN:	10A, 5F
NUMBER ROUNDS:	240A, 40F
FIRE DURATION:	10
----- RESULTS DATA -----	
ATTACK DELAY TIME:	SERIAL LEVEL
TIME TO OBJECTIVE:	SERIAL LEVEL
CASUALTIES:	SERIAL LEVEL
EQUIPMENT DAMAGE:	SERIAL LEVEL
OTHER FACTORS:	SERIAL LEVEL
OTHER RESULTS:	SERIAL LEVEL
SUPPRESSION:	SERIAL LEVEL
----- CALCULATED DATA -----	
RDS/SQ YD:	TARGET LEVEL
RDS/SQ YD/MIN:	TARGET LEVEL
LBS/SQ YD:	TARGET LEVEL
LBS/SQ YD/MIN:	TARGET LEVEL
LBS/SQ YD (EQ):	TARGET LEVEL
LBS/SQ YD/MIN (EQ):	TARGET LEVEL

## PHASE

SERIAL:	24
TARGET NUMBER:	2
PHASE NUMBER:	2
TIME:	1955
----- TARGET DATA -----	
TARGET:	TARGET LEVEL
TARGET AREA:	TARGET LEVEL
PHASE TACTICS:	CONCENTRATION
----- FIRING DATA -----	
FIRE UNIT:	1 FD REGT, 1 MD BATT
TYPE WEAPONS:	A, F
NUMBER TUBES:	24A, 8F
TYPE AMMO:	??A, ??F
ROUNDS PER GUN:	5A, 2.5F
NUMBER ROUNDS:	120A, 20F
FIRE DURATION:	5
----- RESULTS DATA -----	
ATTACK DELAY TIME:	SERIAL LEVEL
TIME TO OBJECTIVE:	SERIAL LEVEL
CASUALTIES:	SERIAL LEVEL
EQUIPMENT DAMAGE:	SERIAL LEVEL
OTHER FACTORS:	SERIAL LEVEL
OTHER RESULTS:	SERIAL LEVEL
SUPPRESSION:	SERIAL LEVEL
----- CALCULATED DATA -----	
RDS/SQ YD:	TARGET LEVEL
RDS/SQ YD/MIN:	TARGET LEVEL
LBS/SQ YD:	TARGET LEVEL
LBS/SQ YD/MIN:	TARGET LEVEL
LBS/SQ YD (EQ):	TARGET LEVEL
LBS/SQ YD/MIN (EQ):	TARGET LEVEL

## TARGET

SERIAL:	24
TARGET NUMBER:	3
NUMBER PHASES:	4
TIME:	2010
----- TARGET DATA -----	
TARGET:	M SPADURO
TARGET AREA:	56000
TARGET TACTICS:	BOMBARD M SPADURO
----- FIRING DATA -----	
FIRE UNIT:	PHASE LEVEL
TYPE WEAPONS:	PHASE LEVEL
NUMBER TUBES:	PHASE LEVEL
TYPE AMMO:	PHASE LEVEL
ROUNDS PER GUN:	PHASE LEVEL
NUMBER ROUNDS:	PHASE LEVEL
FIRE DURATION:	??
----- RESULTS DATA -----	
ATTACK DELAY TIME:	SERIAL LEVEL
TIME TO OBJECTIVE:	SERIAL LEVEL
CASUALTIES:	SERIAL LEVEL
EQUIPMENT DAMAGE:	SERIAL LEVEL
OTHER FACTORS:	SERIAL LEVEL
OTHER RESULTS:	SERIAL LEVEL
SUPPRESSION:	SERIAL LEVEL
----- CALCULATED DATA -----	
RDS/SQ YD:	0.257A, 0.00429F
RDS/SQ YD/MIN:	??A, ??F
LBS/SQ YD:	0.643A, 0.343F
LBS/SQ YD/MIN:	??A, ??F
LBS/SQ YD (EQ):	0.643A, 0.285F
LBS/SQ YD/MIN (EQ):	??A, ??F

## PHASE

SERIAL:	24
TARGET NUMBER:	3
PHASE NUMBER:	1
TIME:	2010
----- TARGET DATA -----	
TARGET:	TARGET LEVEL
TARGET AREA:	TARGET LEVEL
PHASE TACTICS:	CONCENTRATION
----- FIRING DATA -----	
FIRE UNIT:	1 FO REGT, 1 MD BATT
TYPE WEAPONS:	A, F
NUMBER TUBES:	24A, 8F
TYPE AMMO:	??A, ??F
ROUNDS PER GUN:	20A, 10F
NUMBER ROUNDS:	480A, 80F
FIRE DURATION:	20
----- RESULTS DATA -----	
ATTACK DELAY TIME:	SERIAL LEVEL
TIME TO OBJECTIVE:	SERIAL LEVEL
CASUALTIES:	SERIAL LEVEL
EQUIPMENT DAMAGE:	SERIAL LEVEL
OTHER FACTORS:	SERIAL LEVEL
OTHER RESULTS:	SERIAL LEVEL
SUPPRESSION:	SERIAL LEVEL
----- CALCULATED DATA -----	
RDS/SQ YD:	TARGET LEVEL
RDS/SQ YD/MIN:	TARGET LEVEL
LBS/SQ YD:	TARGET LEVEL
LBS/SQ YD/MIN:	TARGET LEVEL
LBS/SQ YD (EQ):	TARGET LEVEL
LBS/SQ YD/MIN (EQ):	TARGET LEVEL

## PHASE

```

SERIAL:          24
TARGET NUMBER:   3
PHASE NUMBER:    2
TIME:           2045
----- TARGET DATA -----
TARGET:         TARGET LEVEL

TARGET AREA:    TARGET LEVEL
PHASE TACTICS:  CONCENTRATION

----- FIRING DATA -----
FIRE UNIT:      1 FD REGT. 1 MO BATT
TYPE WEAPONS:   A.F
NUMBER TUBES:   24A,8F
TYPE AMMO:      ??A,??F
ROUNDS PER GUN: 10A,5F
NUMBER ROUNDS: 240A,40F
FIRE DURATION:  5

----- RESULTS DATA -----
ATTACK DELAY TIME: SERIAL LEVEL
TIME TO OBJECTIVE: SERIAL LEVEL
CASUALTIES:       SERIAL LEVEL
EQUIPMENT DAMAGE: SERIAL LEVEL
OTHER FACTORS:    SERIAL LEVEL

OTHER RESULTS:   SERIAL LEVEL
SUPPRESSION:     SERIAL LEVEL

----- CALCULATED DATA -----
RDS/SQ YD:       TARGET LEVEL
RDS/SQ YD/MIN:   TARGET LEVEL
LBS/SQ YD:       TARGET LEVEL
LBS/SQ YD/MIN:   TARGET LEVEL
LBS/SQ YD (EQ): TARGET LEVEL
LBS/SQ YD/MIN (EQ): TARGET LEVEL
    
```

## PHASE

```

SERIAL:          24
TARGET NUMBER:   3
PHASE NUMBER:    3
TIME:           N
----- TARGET DATA -----
TARGET:         TARGET LEVEL

TARGET AREA:    TARGET LEVEL
PHASE TACTICS:  CONCENTRATION

----- FIRING DATA -----
FIRE UNIT:      1 FD REGT, 1 MO BATT
TYPE WEAPONS:   A.F
NUMBER TUBES:   24A,8F
TYPE AMMO:      ??A,??F
ROUNDS PER GUN: 20A,10F
NUMBER ROUNDS: 480A,80F
FIRE DURATION:  20

----- RESULTS DATA -----
ATTACK DELAY TIME: SERIAL LEVEL
TIME TO OBJECTIVE: SERIAL LEVEL
CASUALTIES:       SERIAL LEVEL
EQUIPMENT DAMAGE: SERIAL LEVEL
OTHER FACTORS:    SERIAL LEVEL

OTHER RESULTS:   SERIAL LEVEL
SUPPRESSION:     SERIAL LEVEL

----- CALCULATED DATA -----
RDS/SQ YD:       TARGET LEVEL
RDS/SQ YD/MIN:   TARGET LEVEL
LBS/SQ YD:       TARGET LEVEL
LBS/SQ YD/MIN:   TARGET LEVEL
LBS/SQ YD (EQ): TARGET LEVEL
LBS/SQ YD/MIN (EQ): TARGET LEVEL
    
```

## PHASE

SERIAL: 24  
TARGET NUMBER: 3  
PHASE NUMBER: 4  
TIME: N+35

----- TARGET DATA -----  
TARGET: TARGET LEVEL

TARGET AREA: TARGET LEVEL  
PHASE TACTICS: CONCENTRATION

----- FIRING DATA -----  
FIRE UNIT: 1 FD REGT, 1 MD BATT  
TYPE WEAPONS: A, F  
NUMBER TUBES: 24A, 8F  
TYPE AMMO: ??A, ??F  
ROUNDS PER GUN: 10A, 5F  
NUMBER ROUNDS: 240A, 40F  
FIRE DURATION: 5

----- RESULTS DATA -----  
ATTACK DELAY TIME: SERIAL LEVEL  
TIME TO OBJECTIVE: SERIAL LEVEL  
CASUALTIES: SERIAL LEVEL  
EQUIPMENT DAMAGE: SERIAL LEVEL  
OTHER FACTORS: SERIAL LEVEL

OTHER RESULTS: SERIAL LEVEL  
SUPPRESSION: SERIAL LEVEL

----- CALCULATED DATA -----  
RDS/SQ YD: TARGET LEVEL  
RDS/SQ YD/MIN: TARGET LEVEL  
LBS/SQ YD: TARGET LEVEL  
LBS/SQ YD/MIN: TARGET LEVEL  
LBS/SQ YD (EQ): TARGET LEVEL  
LBS/SQ YD/MIN (EQ): TARGET LEVEL

## TARGET

SERIAL: 24  
TARGET NUMBER: 4  
NUMBER PHASES: 1  
TIME: 2100

----- TARGET DATA -----  
TARGET: PHASE LEVEL

TARGET AREA: PHASE LEVEL  
TARGET TACTICS: ??

----- FIRING DATA -----  
FIRE UNIT: PHASE LEVEL  
TYPE WEAPONS: PHASE LEVEL  
NUMBER TUBES: PHASE LEVEL  
TYPE AMMO: PHASE LEVEL  
ROUNDS PER GUN: PHASE LEVEL  
NUMBER ROUNDS: PHASE LEVEL  
FIRE DURATION: 10

----- RESULTS DATA -----  
ATTACK DELAY TIME: SERIAL LEVEL  
TIME TO OBJECTIVE: SERIAL LEVEL  
CASUALTIES: SERIAL LEVEL  
EQUIPMENT DAMAGE: SERIAL LEVEL  
OTHER FACTORS: SERIAL LEVEL

OTHER RESULTS: SERIAL LEVEL  
SUPPRESSION: SERIAL LEVEL

----- CALCULATED DATA -----  
RDS/SQ YD: PHASE LEVEL  
RDS/SQ YD/MIN: PHASE LEVEL  
LBS/SQ YD: PHASE LEVEL  
LBS/SQ YD/MIN: PHASE LEVEL  
LBS/SQ YD (EQ): PHASE LEVEL  
LBS/SQ YD/MIN (EQ): PHASE LEVEL

# PHASE

SERIAL: 24  
TARGET NUMBER: 4  
PHASE NUMBER: 1  
TIME: 2100

----- TARGET DATA -----  
TARGET: ??

TARGET AREA: 56000  
PHASE TACTICS: CONCENTRATION

----- FIRING DATA -----  
FIRE UNIT: 1 FD REGT, 1 MD BATT  
TYPE WEAPONS: A, F  
NUMBER TUBES: 24A, 8F  
TYPE AMMO: ??A, ??F  
ROUNDS PER GUN: 10A, 5F  
NUMBER ROUNDS: 240A, 40F  
FIRE DURATION: 10

----- RESULTS DATA -----  
ATTACK DELAY TIME: SERIAL LEVEL  
TIME TO OBJECTIVE: SERIAL LEVEL  
CASUALTIES: SERIAL LEVEL  
EQUIPMENT DAMAGE: SERIAL LEVEL  
OTHER FACTORS: SERIAL LEVEL

OTHER RESULTS: SERIAL LEVEL  
SUPPRESSION: SERIAL LEVEL

----- CALCULATED DATA -----  
RDS/SQ YD: 0.06429A, 0.000714F  
RDS/SQ YD/MIN: ??A, ??F  
LBS/SQ YD: 0.107A, 0.0571F  
LBS/SQ YD/MIN: ??A, ??F  
LBS/SQ YD (EQ): 0.107A, 0.0474F  
LBS/SQ YD/MIN (EQ): ??A, ??F

## SERIAL

SERIAL: 25  
 REF NUMBER: A10  
 ORIG REF: 1ORS 1/25C6  
 REF TITLE: THE EFFECT OF ARTILLERY FIRE  
 DATA SOURCE: ACTION REPORT

----- SERIAL DATA -----

SIDE 1 COUNTRY: BRITAIN  
 SIDE 1 UNITS: 2 FD REGT, 2 MD BATT, 1 HV REGT, 1 HORSE BATT  
 SIDE 1 POSTURE: ATTACKING  
 SIDE 2 COUNTRY: GERMANY  
 SIDE 2 UNITS: 1 PLATOON  
 SIDE 2 POSTURE: DEFENDING

DATE OF ACTION: 10/20/44  
 COUNTRY: ITALY  
 REGION: FONTANELICE  
 TERRAIN: MOUNTAINOUS  
 WEATHER: ??  
 TIME: 1915

SERIAL TACTICS: INFANTRY WERE TO ATTACK CLOSELY BEHIND ARTILLERY BOMBARDMENT

NO. BMBRD TARGETS: 4  
 NO. PHASES/TGT: 3/3/4/7

----- TARGET DATA -----

BOMBARD TARGET: TARGET LEVEL  
 BOMBARD TGT AREA: TARGET LEVEL  
 BOMBARD TACTICS: TARGET LEVEL

----- FIRING DATA -----

FIRE UNIT: PHASE LEVEL  
 TYPE WEAPONS: PHASE LEVEL  
 NUMBER TUBES: PHASE LEVEL  
 TYPE AMMO: PHASE LEVEL  
 ROUNDS PER GUN: PHASE LEVEL  
 NUMBER ROUNDS: PHASE LEVEL  
 FIRE DURATION: TARGET LEVEL AND PHASE LEVEL

----- RESULTS DATA -----

ATTACK DELAY TIME: NO DELAY  
 TIME TO OBJECTIVE: VERY SHORT TIME  
 CASUALTIES: 1 KIA, 2 WIA, 4 POW (GERMAN); 5 KIA, 7 WIA (BRITISH)  
 EQUIPMENT DAMAGE: ??;??  
 OTHER FACTORS: NONE

OTHER RESULTS: QUICK FOLLOW-UP BY INFANTRY GAVE NO TIME FOR RECOVERY  
 SUPPRESSION: LEVEL OF SHELLING EITHER NEUTRALIZED OR SUPPRESSED GERMANS

----- CALCULATED DATA -----

RDS/SQ YD: TARGET LEVEL  
 RDS/SQ YD/MIN: TARGET LEVEL  
 LBS/SQ YD: TARGET LEVEL  
 LBS/SQ YD/MIN: TARGET LEVEL  
 LBS/SQ YD (EQ): TARGET LEVEL  
 LBS/SQ YD/MIN (EQ): TARGET LEVEL

## TARGET

```

SERIAL:          25
TARGET NUMBER:   1
NUMBER PHASES:   3
TIME:            1855
-----
TARGET:          TARGET DATA
                  GERMAN POSITION

TARGET AREA:     50000
TARGET TACTICS:  BOMBARD GERMAN POSITION

-----
FIRING DATA
FIRE UNIT:       PHASE LEVEL
TYPE WEAPONS:    PHASE LEVEL
NUMBER TUBES:    PHASE LEVEL
TYPE AMMO:       PHASE LEVEL
ROUNDS PFR GUN: PHASE LEVEL
NUMBER ROUNDS:  PHASE LEVEL
FIRE DURATION:   25
-----
RESULTS DATA
ATTACK DELAY TIME: SERIAL LEVEL
TIME TO OBJECTIVE: SERIAL LEVEL
CASUALTIES:       SERIAL LEVEL
EQUIPMENT DAMAGE: SERIAL LEVEL
OTHER FACTORS:    SERIAL LEVEL

OTHER RESULTS:   SERIAL LEVEL
SUPPRESSION:     SERIAL LEVEL

-----
CALCULATED DATA
RDS/SQ YD:       0.048A,0.0032F
RDS/SQ YD/MIN:   ??A,??F
LBS/SQ YD:       0.120A,0.256F
LBS/SQ YD/MIN:   ??A,??F
LBS/SQ YD (EQ): 0.120A,0.212F
LBS/SQ YD/MIN (EQ):??A,??F
  
```

## PHASE

```

SERIAL:          25
TARGET NUMBER:   1
PHASE NUMBER:    1
TIME:            1855
-----
TARGET:          TARGET DATA
                  TARGET LEVEL

TARGET AREA:     TARGET LEVEL
PHASE TACTICS:   CONCENTRATION

-----
FIRING DATA
FIRE UNIT:       ??
TYPE WEAPONS:    A,F
NUMBER TUBES:    4A,4F
TYPE AMMO:       ??A,??F
ROUNDS PER GUN:  30A,30F
NUMBER ROUNDS:  120A,120F
FIRE DURATION:   15
-----
RESULTS DATA
ATTACK DELAY TIME: SERIAL LEVEL
TIME TO OBJECTIVE: SERIAL LEVEL
CASUALTIES:       SERIAL LEVEL
EQUIPMENT DAMAGE: SERIAL LEVEL
OTHER FACTORS:    SERIAL LEVEL

OTHER RESULTS:   SERIAL LEVEL
SUPPRESSION:     SERIAL LEVEL

-----
CALCULATED DATA
RDS/SQ YD:       TARGET LEVEL
RDS/SQ YD/MIN:   TARGET LEVEL
LBS/SQ YD:       TARGET LEVEL
LBS/SQ YD/MIN:   TARGET LEVEL
LBS/SQ YD (EQ):  TARGET LEVEL
LBS/SQ YD/MIN (EQ):TARGET LEVEL
  
```

## PHASE

SERIAL: 25  
TARGET NUMBER: 1  
PHASE NUMBER: 2  
TIME: 1910

----- TARGET DATA -----  
TARGET: TARGET LEVEL

TARGET AREA: TARGET LEVEL  
PHASE TACTICS: CONCENTRATION

----- FIRING DATA -----  
FIRE UNIT: ??  
TYPE WEAPONS: A,F  
NUMBER TUBES: 4A,4F  
TYPE AMMO: ??A,??F  
ROUNDS PER GUN: 15A,10F  
NUMBER ROUNDS: 60A,40F  
FIRE DURATION: 5

----- RESULTS DATA -----  
ATTACK DELAY TIME: SERIAL LEVEL  
TIME TO OBJECTIVE: SERIAL LEVEL  
CASUALTIES: SERIAL LEVEL  
EQUIPMENT DAMAGE: SERIAL LEVEL  
OTHER FACTORS: SERIAL LEVEL

OTHER RESULTS: SERIAL LEVEL  
SUPPRESSION: SERIAL LEVEL

----- CALCULATED DATA -----  
RDS/SQ YD: TARGET LEVEL  
RDS/SQ YD/MIN: TARGET LEVEL  
LBS/SQ YD: TARGET LEVEL  
LBS/SQ YD/MIN: TARGET LEVEL  
LBS/SQ YD (EQ): TARGET LEVEL  
LBS/SQ YD/MIN (EQ): TARGET LEVEL

## PHASE

SERIAL: 25  
TARGET NUMBER: 1  
PHASE NUMBER: 3  
TIME: 1915

----- TARGET DATA -----  
TARGET: TARGET LEVEL

TARGET AREA: TARGET LEVEL  
PHASE TACTICS: CONCENTRATION

----- FIRING DATA -----  
FIRE UNIT: ??  
TYPE WEAPONS: A  
NUMBER TUBES: 4A  
TYPE AMMO: ??A  
ROUNDS PER GUN: 15A  
NUMBER ROUNDS: 60  
FIRE DURATION: 5

----- RESULTS DATA -----  
ATTACK DELAY TIME: SERIAL LEVEL  
TIME TO OBJECTIVE: SERIAL LEVEL  
CASUALTIES: SERIAL LEVEL  
EQUIPMENT DAMAGE: SERIAL LEVEL  
OTHER FACTORS: SERIAL LEVEL

OTHER RESULTS: SERIAL LEVEL  
SUPPRESSION: SERIAL LEVEL

----- CALCULATED DATA -----  
RDS/SQ YD: TARGET LEVEL  
RDS/SQ YD/MIN: TARGET LEVEL  
LBS/SQ YD: TARGET LEVEL  
LBS/SQ YD/MIN: TARGET LEVEL  
LBS/SQ YD (EQ): TARGET LEVEL  
LBS/SQ YD/MIN (EQ): TARGET LEVEL

## TARGET

```

SERIAL:          25
TARGET NUMBER:   2
NUMBER PHASES:   3
TIME:            1855
----- TARGET DATA -----
TARGET:          GERMAN POSITION

TARGET AREA:     48000
TARGET TACTICS:  BOMBARD GERMAN POSITION

----- FIRING DATA -----
FIRE UNIT:       PHASE LEVEL
TYPE WEAPONS:    PHASE LEVEL
NUMBER TUBES:    PHASE LEVEL
TYPE AMMO:       PHASE LEVEL
ROUNDS PER GUN:  PHASE LEVEL
NUMBER ROUNDS:   PHASE LEVEL
FIRE DURATION:   20

----- RESULTS DATA -----
ATTACK DELAY TIME: SERIAL LEVEL
TIME TO OBJECTIVE: SERIAL LEVEL
CASUALTIES:       SERIAL LEVEL
EQUIPMENT DAMAGE: SERIAL LEVEL
OTHER FACTORS:    SERIAL LEVEL

OTHER RESULTS:   SERIAL LEVEL
SUPPRESSION:     SERIAL LEVEL

----- CALCULATED DATA -----
RDS/SQ YD:       0.025A
RDS/SQ YD/MIN:   ??A
LBS/SQ YD:       0.025A
LBS/SQ YD/MIN:   ??A
LBS/SQ YD (EQ): 0.025A
LBS/SQ YD/MIN (EQ): ??A
  
```

## PHASE

```

SERIAL:          25
TARGET NUMBER:   2
PHASE NUMBER:    1
TIME:            1855
----- TARGET DATA -----
TARGET:          TARGET LEVEL

TARGET AREA:     TARGET LEVEL
PHASE TACTICS:   CONCENTRATION

----- FIRING DATA -----
FIRE UNIT:       ??
TYPE WEAPONS:    A
NUMBER TUBES:    16A
TYPE AMMO:       ??A
ROUNDS PER GUN:  30A
NUMBER ROUNDS:   480A
FIRE DURATION:   10

----- RESULTS DATA -----
ATTACK DELAY TIME: SERIAL LEVEL
TIME TO OBJECTIVE: SERIAL LEVEL
CASUALTIES:       SERIAL LEVEL
EQUIPMENT DAMAGE: SERIAL LEVEL
OTHER FACTORS:    SERIAL LEVEL

OTHER RESULTS:   SERIAL LEVEL
SUPPRESSION:     SERIAL LEVEL

----- CALCULATED DATA -----
RDS/SQ YD:       TARGET LEVEL
RDS/SQ YD/MIN:   TARGET LEVEL
LBS/SQ YD:       TARGET LEVEL
LBS/SQ YD/MIN:   TARGET LEVEL
LBS/SQ YD (EQ):  TARGET LEVEL
LBS/SQ YD/MIN (EQ): TARGET LEVEL
  
```

## PHASE

SERIAL:	25
TARGET NUMBER:	2
PHASE NUMBER:	2
TIME:	1855
----- TARGET DATA -----	
TARGET:	TARGET LEVEL
TARGET AREA:	TARGET LEVEL
PHASE TACTICS:	CONCENTRATION
----- FIRING DATA -----	
FIRE UNIT:	??
TYPE WEAPONS:	A
NUMBER TUBES:	16A
TYPE AMMO:	??A
ROUNDS PER GUN:	15A
NUMBER ROUNDS:	240A
FIRE DURATION:	5
----- RESULTS DATA -----	
ATTACK DELAY TIME:	SERIAL LEVEL
TIME TO OBJECTIVE:	SERIAL LEVEL
CASUALTIES:	SERIAL LEVEL
EQUIPMENT DAMAGE:	SERIAL LEVEL
OTHER FACTORS:	SERIAL LEVEL
OTHER RESULTS:	SERIAL LEVEL
SUPPRESSION:	SERIAL LEVEL
----- CALCULATED DATA -----	
ROS/SQ YD:	TARGET LEVEL
ROS/SQ YD/MIN:	TARGET LEVEL
LBS/SQ YD:	TARGET LEVEL
LBS/SQ YD/MIN:	TARGET LEVEL
LBS/SQ YD (EQ):	TARGET LEVEL
LBS/SQ YD/MIN (EQ):	TARGET LEVEL

## PHASE

SERIAL:	25
TARGET NUMBER:	2
PHASE NUMBER:	3
TIME:	1900
----- TARGET DATA -----	
TARGET:	TARGET LEVEL
TARGET AREA:	TARGET LEVEL
PHASE TACTICS:	CONCENTRATION
----- FIRING DATA -----	
FIRE UNIT:	??
TYPE WEAPONS:	A
NUMBER TUBES:	16A
TYPE AMMO:	??A
ROUNDS PER GUN:	30A
NUMBER ROUNDS:	480A
FIRE DURATION:	15
----- RESULTS DATA -----	
ATTACK DELAY TIME:	SERIAL LEVEL
TIME TO OBJECTIVE:	SERIAL LEVEL
CASUALTIES:	SERIAL LEVEL
EQUIPMENT DAMAGE:	SERIAL LEVEL
OTHER FACTORS:	SERIAL LEVEL
OTHER RESULTS:	SERIAL LEVEL
SUPPRESSION:	SERIAL LEVEL
----- CALCULATED DATA -----	
ROS/SQ YD:	TARGET LEVEL
ROS/SQ YD/MIN:	TARGET LEVEL
LBS/SQ YD:	TARGET LEVEL
LBS/SQ YD/MIN:	TARGET LEVEL
LBS/SQ YD (EQ):	TARGET LEVEL
LBS/SQ YD/MIN (EQ):	TARGET LEVEL

## TARGET

SERIAL	25
TARGET NUMBER:	3
NUMBER PHASES:	4
TIME	1855
----- TARGET DATA -----	
TARGET:	GERMAN POSITION
TARGET AREA	112000
TARGET TACTICS:	BOMBARD GERMAN POSITION
----- FIRING DATA -----	
FIRE UNIT:	PHASE LEVEL
TYPE WEAPONS:	PHASE LEVEL
NUMBER TUBES:	PHASE LEVEL
TYPE AMMO:	PHASE LEVEL
ROUNDS PER GUN:	PHASE LEVEL
NUMBER ROUNDS:	PHASE LEVEL
FIRE DURATION:	30
----- RESULTS DATA -----	
ATTACK DELAY TIME:	SERIAL LEVEL
TIME TO OBJECTIVE:	SERIAL LEVEL
CASUALTIES:	SERIAL LEVEL
EQUIPMENT DAMAGE:	SERIAL LEVEL
OTHER FACTORS:	SERIAL LEVEL
OTHER RESULTS:	SERIAL LEVEL
SUPPRESSION:	SERIAL LEVEL
----- CALCULATED DATA -----	
RDS/SQ YD:	0.0188A, 0.00143F
RDS/SQ YD/MIN:	77A, 77F
LBS/SQ YD:	0.388A, 0.114F
LBS/SQ YD/MIN:	77A, 77F
LBS/SQ YD (EQ):	0.388A, 0.0949F
LBS/SQ YD/MIN (EQ):	77A, 77F

## PHASE

SERIAL	25
TARGET NUMBER:	3
PHASE NUMBER:	1
TIME	1855
----- TARGET DATA -----	
TARGET:	TARGET LEVEL
TARGET AREA	TARGET LEVEL
PHASE TACTICS:	CONCENTRATION
----- FIRING DATA -----	
FIRE UNIT:	77
TYPE WEAPONS:	A, F
NUMBER TUBES:	24A, 8F
TYPE AMMO:	77A, 77F
ROUNDS PER GUN:	18A, 10F
NUMBER ROUNDS:	380A, 80F
FIRE DURATION:	9
----- RESULTS DATA -----	
ATTACK DELAY TIME:	SERIAL LEVEL
TIME TO OBJECTIVE:	SERIAL LEVEL
CASUALTIES:	SERIAL LEVEL
EQUIPMENT DAMAGE:	SERIAL LEVEL
OTHER FACTORS:	SERIAL LEVEL
OTHER RESULTS:	SERIAL LEVEL
SUPPRESSION:	SERIAL LEVEL
----- CALCULATED DATA -----	
RDS/SQ YD:	TARGET LEVEL
RDS/SQ YD/MIN:	TARGET LEVEL
LBS/SQ YD:	TARGET LEVEL
LBS/SQ YD/MIN:	TARGET LEVEL
LBS/SQ YD (EQ):	TARGET LEVEL
LBS/SQ YD/MIN (EQ):	TARGET LEVEL

## PHASE

SERIAL:	25
TARGET NUMBER:	3
PHASE NUMBER:	2
TIME:	1900
----- TARGET DATA -----	
TARGET:	TARGET LEVEL
TARGET AREA:	TARGET LEVEL
PHASE TACTICS:	CONCENTRATION
----- FIRING DATA -----	
FIRE UNIT:	?7
TYPE WEAPONS:	A.F
NUMBER TUBES:	24A,8F
TYPE AMMO:	?7A,?7F
ROUNDS PER GUN:	20A,10F
NUMBER ROUNDS:	480A,80F
FIRE DURATION:	10
----- RESULTS DATA -----	
ATTACK DELAY TIME:	SERIAL LEVEL
TIME TO OBJECTIVE:	SERIAL LEVEL
CASUALTIES:	SERIAL LEVEL
EQUIPMENT DAMAGE:	SERIAL LEVEL
OTHER FACTORS:	SERIAL LEVEL
OTHER RESULTS:	SERIAL LEVEL
SUPPRESSION:	SERIAL LEVEL
----- CALCULATED DATA -----	
RDS/SQ YD:	TARGET LEVEL
RDS/SQ YD/MIN:	TARGET LEVEL
LBS/SQ YD:	TARGET LEVEL
LBS/SQ YD/MIN:	TARGET LEVEL
LBS/SQ YD (EQ):	TARGET LEVEL
LBS/SQ YD/MIN (EQ):	TARGET LEVEL

## PHASE

SERIAL:	25
TARGET NUMBER:	3
PHASE NUMBER:	3
TIME:	1910
----- TARGET DATA -----	
TARGET:	TARGET LEVEL
TARGET AREA:	TARGET LEVEL
PHASE TACTICS:	CONCENTRATION
----- FIRING DATA -----	
FIRE UNIT:	?7
TYPE WEAPONS:	A
NUMBER TUBES:	24A
TYPE AMMO:	?7A
ROUNDS PER GUN:	20A
NUMBER ROUNDS:	480A
FIRE DURATION:	10
----- RESULTS DATA -----	
ATTACK DELAY TIME:	SERIAL LEVEL
TIME TO OBJECTIVE:	SERIAL LEVEL
CASUALTIES:	SERIAL LEVEL
EQUIPMENT DAMAGE:	SERIAL LEVEL
OTHER FACTORS:	SERIAL LEVEL
OTHER RESULTS:	SERIAL LEVEL
SUPPRESSION:	SERIAL LEVEL
----- CALCULATED DATA -----	
RDS/SQ YD:	TARGET LEVEL
RDS/SQ YD/MIN:	TARGET LEVEL
LBS/SQ YD:	TARGET LEVEL
LBS/SQ YD/MIN:	TARGET LEVEL
LBS/SQ YD (EQ):	TARGET LEVEL
LBS/SQ YD/MIN (EQ):	TARGET LEVEL

## PHASE

SERIAL:	25	
TARGET NUMBER:	3	
PHASE NUMBER:	4	
TIME:	1915	
-----		TARGET DATA
TARGET:	TARGET LEVEL	
TARGET AREA:	TARGET LEVEL	
PHASE TACTICS:	CONCENTRATION	
-----		FIRING DATA
FIRE UNIT:	??	
TYPE WEAPONS:	A	
NUMBER TUBES:	24A	
TYPE AMMO:	??A	
ROUNDS PER GUN:	17.5A	
NUMBER ROUNDS:	420A	
FIRE DURATION:	10	
-----		RESULTS DATA
ATTACK DELAY TIME:	SERIAL LEVEL	
TIME TO OBJECTIVE:	SERIAL LEVEL	
CASUALTIES:	SERIAL LEVEL	
EQUIPMENT DAMAGE:	SERIAL LEVEL	
OTHER FACTORS:	SERIAL LEVEL	
OTHER RESULTS:	SERIAL LEVEL	
SUPPRESSION:	SERIAL LEVEL	
-----		CALCULATED DATA
RDS/SQ YD:	TARGET LEVEL	
RDS/SQ YD/MIN:	TARGET LEVEL	
LBS/SQ YD:	TARGET LEVEL	
LBS/SQ YD/MIN:	TARGET LEVEL	
LBS/SQ YD (EQ):	TARGET LEVEL	
LBS/SQ YD/MIN (EQ):	TARGET LEVEL	

## TARGET

SERIAL:	25	
TARGET NUMBER:	4	
NUMBER PHASES:	7	
TIME:	1855	
-----		TARGET DATA
TARGET:	GERMAN POSITION	
TARGET AREA:	??	
TARGET TACTICS:	BOMBARD GERMAN POSITION	
-----		FIRING DATA
FIRE UNIT:	PHASE LEVEL	
TYPE WEAPONS:	PHASE LEVEL	
NUMBER TUBES:	PHASE LEVEL	
TYPE AMMO:	PHASE LEVEL	
ROUNDS PER GUN:	PHASE LEVEL	
NUMBER ROUNDS:	PHASE LEVEL	
FIRE DURATION:	80	
-----		RESULTS DATA
ATTACK DELAY TIME:	SERIAL LEVEL	
TIME TO OBJECTIVE:	SERIAL LEVEL	
CASUALTIES:	SERIAL LEVEL	
EQUIPMENT DAMAGE:	SERIAL LEVEL	
OTHER FACTORS:	SERIAL LEVEL	
OTHER RESULTS:	SERIAL LEVEL	
SUPPRESSION:	SERIAL LEVEL	
-----		CALCULATED DATA
RDS/SQ YD:	??A, ??F, ??H	
RDS/SQ YD/MIN:	??A, ??F, ??H	
LBS/SQ YD:	??A, ??F, ??H	
LBS/SQ YD/MIN:	??A, ??F, ??H	
LBS/SQ YD (EQ):	??A, ??F, ??H	
LBS/SQ YD/MIN (EQ):	??A, ??F, ??H	

## PHASE

SERIAL:	25
TARGET NUMBER:	4
PHASE NUMBER:	1
TIME:	1855
----- TARGET DATA -----	
TARGET:	TARGET LEVEL
TARGET AREA:	TARGET LEVEL
PHASE TACTICS:	CONCENTRATION
----- FIRING DATA -----	
FIRE UNIT:	??
TYPE WEAPONS:	A
NUMBER TUBES:	8A
TYPE AMMO:	??A
ROUNDS PER GUN:	40A
NUMBER ROUNDS:	320A
FIRE DURATION:	20
----- RESULTS DATA -----	
ATTACK DELAY TIME:	SERIAL LEVEL
TIME TO OBJECTIVE:	SERIAL LEVEL
CASUALTIES:	SERIAL LEVEL
EQUIPMENT DAMAGE:	SERIAL LEVEL
OTHER FACTORS:	SERIAL LEVEL
OTHER RESULTS:	SERIAL LEVEL
SUPPRESSION:	SERIAL LEVEL
----- CALCULATED DATA -----	
RDS/SQ YD:	TARGET LEVEL
RDS/SQ YD/MIN:	TARGET LEVEL
LBS/SQ YD:	TARGET LEVEL
LBS/SQ YD/MIN:	TARGET LEVEL
LBS/SQ YD (EQ):	TARGET LEVEL
LBS/SQ YD/MIN (EQ):	TARGET LEVEL

## PHASE

SERIAL:	25
TARGET NUMBER:	4
PHASE NUMBER:	2
TIME:	1910
----- TARGET DATA -----	
TARGET:	TARGET LEVEL
TARGET AREA:	TARGET LEVEL
PHASE TACTICS:	CONCENTRATION
----- FIRING DATA -----	
FIRE UNIT:	??
TYPE WEAPONS:	F
NUMBER TUBES:	4F
TYPE AMMO:	??F
ROUNDS PER GUN:	30F
NUMBER ROUNDS:	120F
FIRE DURATION:	10
----- RESULTS DATA -----	
ATTACK DELAY TIME:	SERIAL LEVEL
TIME TO OBJECTIVE:	SERIAL LEVEL
CASUALTIES:	SERIAL LEVEL
EQUIPMENT DAMAGE:	SERIAL LEVEL
OTHER FACTORS:	SERIAL LEVEL
OTHER RESULTS:	SERIAL LEVEL
SUPPRESSION:	SERIAL LEVEL
----- CALCULATED DATA -----	
RDS/SQ YD:	TARGET LEVEL
RDS/SQ YD/MIN:	TARGET LEVEL
LBS/SQ YD:	TARGET LEVEL
LBS/SQ YD/MIN:	TARGET LEVEL
LBS/SQ YD (EQ):	TARGET LEVEL
LBS/SQ YD/MIN (EQ):	TARGET LEVEL

## PHASE

SERIAL:	25
TARGET NUMBER:	4
PHASE NUMBER:	3
TIME:	1915
----- TARGET DATA -----	
TARGET:	TARGET LEVEL
TARGET AREA:	TARGET LEVEL
PHASE TACTICS:	CONCENTRATION
----- FIRING DATA -----	
FIRE UNIT:	??
TYPE WEAPONS:	A, F
NUMBER TUBES:	8A, 4F
TYPE AMMO:	??A, ??F
ROUNDS PER GUN:	10A, 5F
NUMBER ROUNDS:	80A, 20F
FIRE DURATION:	5
----- RESULTS DATA -----	
ATTACK DELAY TIME:	SERIAL LEVEL
TIME TO OBJECTIVE:	SERIAL LEVEL
CASUALTIES:	SERIAL LEVEL
EQUIPMENT DAMAGE:	SERIAL LEVEL
OTHER FACTORS:	SERIAL LEVEL
OTHER RESULTS:	SERIAL LEVEL
SUPPRESSION:	SERIAL LEVEL
----- CALCULATED DATA -----	
RDS/SQ YD:	TARGET LEVEL
RDS/SQ YD/MIN:	TARGET LEVEL
LBS/SQ YD:	TARGET LEVEL
LBS/SQ YD/MIN:	TARGET LEVEL
LBS/SQ YD (EQ):	TARGET LEVEL
LBS/SQ YD/MIN (EQ):	TARGET LEVEL

## PHASE

SERIAL:	25
TARGET NUMBER:	4
PHASE NUMBER:	4
TIME:	1915
----- TARGET DATA -----	
TARGET:	TARGET LEVEL
TARGET AREA:	TARGET LEVEL
PHASE TACTICS:	CONCENTRATION
----- FIRING DATA -----	
FIRE UNIT:	??
TYPE WEAPONS:	H
NUMBER TUBES:	16H
TYPE AMMO:	??H
ROUNDS PER GUN:	2.25H
NUMBER ROUNDS:	20H
FIRE DURATION:	50
----- RESULTS DATA -----	
ATTACK DELAY TIME:	SERIAL LEVEL
TIME TO OBJECTIVE:	SERIAL LEVEL
CASUALTIES:	SERIAL LEVEL
EQUIPMENT DAMAGE:	SERIAL LEVEL
OTHER FACTORS:	SERIAL LEVEL
OTHER RESULTS:	SERIAL LEVEL
SUPPRESSION:	SERIAL LEVEL
----- CALCULATED DATA -----	
RDS/SQ YD:	TARGET LEVEL
RDS/SQ YD/MIN:	TARGET LEVEL
LBS/SQ YD:	TARGET LEVEL
LBS/SQ YD/MIN:	TARGET LEVEL
LBS/SQ YD (EQ):	TARGET LEVEL
LBS/SQ YD/MIN (EQ):	TARGET LEVEL

## PHASE

SERIAL:	25
TARGET NUMBER:	4
PHASE NUMBER:	5
TIME:	1915
----- TARGET DATA -----	
TARGET:	TARGET LEVEL
TARGET AREA:	TARGET LEVEL
PHASE TACTICS:	CONCENTRATION
----- FIRING DATA -----	
FIRE UNIT:	??
TYPE WEAPONS:	F
NUMBER TUBES:	4F
TYPE AMMO:	??F
ROUNDS PER GUN:	60F
NUMBER ROUNDS:	240F
FIRE DURATION:	60
----- RESULTS DATA -----	
ATTACK DELAY TIME:	SERIAL LEVEL
TIME TO OBJECTIVE:	SERIAL LEVEL
CASUALTIES:	SERIAL LEVEL
EQUIPMENT DAMAGE:	SERIAL LEVEL
OTHER FACTORS:	SERIAL LEVEL
OTHER RESULTS:	SERIAL LEVEL
SUPPRESSION:	SERIAL LEVEL
----- CALCULATED DATA -----	
RDS/SQ YD:	TARGET LEVEL
RDS/SQ YD/MIN:	TARGET LEVEL
LBS/SQ YD:	TARGET LEVEL
LBS/SQ YD/MIN:	TARGET LEVEL
LBS/SQ YD (EQ):	TARGET LEVEL
LBS/SQ YD/MIN (EQ):	TARGET LEVEL

## PHASE

SERIAL:	25
TARGET NUMBER:	4
PHASE NUMBER:	6
TIME:	1920
----- TARGET DATA -----	
TARGET:	TARGET LEVEL
TARGET AREA:	TARGET LEVEL
PHASE TACTICS:	CONCENTRATION
----- FIRING DATA -----	
FIRE UNIT:	??
TYPE WEAPONS:	A
NUMBER TUBES:	24A
TYPE AMMO:	??A
ROUNDS PER GUN:	110A
NUMBER ROUNDS:	2640A
FIRE DURATION:	55
----- RESULTS DATA -----	
ATTACK DELAY TIME:	SERIAL LEVEL
TIME TO OBJECTIVE:	SERIAL LEVEL
CASUALTIES:	SERIAL LEVEL
EQUIPMENT DAMAGE:	SERIAL LEVEL
OTHER FACTORS:	SERIAL LEVEL
OTHER RESULTS:	SERIAL LEVEL
SUPPRESSION:	SERIAL LEVEL
----- CALCULATED DATA -----	
RDS/SQ YD:	TARGET LEVEL
RDS/SQ YD/MIN:	TARGET LEVEL
LBS/SQ YD:	TARGET LEVEL
LBS/SQ YD/MIN:	TARGET LEVEL
LBS/SQ YD (EQ):	TARGET LEVEL
LBS/SQ YD/MIN (EQ):	TARGET LEVEL

# PHASE

SERIAL:	25
TARGET NUMBER:	4
PHASE NUMBER:	7
TIME:	1920
----- TARGET DATA -----	
TARGET:	TARGET LEVEL
TARGET AREA:	TARGET LEVEL
PHASE TACTICS:	CONCENTRATION
----- FIRING DATA -----	
FIRE UNIT:	??
TYPE WEAPONS:	F
NUMBER TUBES:	4F
TYPE AMMO:	??F
ROUNDS PER GUN:	55F
NUMBER ROUNDS:	220F
FIRE DURATION:	55
----- RESULTS DATA -----	
ATTACK DELAY TIME:	SERIAL LEVEL
TIME TO OBJECTIVE:	SERIAL LEVEL
CASUALTIES:	SERIAL LEVEL
EQUIPMENT DAMAGE:	SERIAL LEVEL
OTHER FACTORS:	SERIAL LEVEL
OTHER RESULTS:	SERIAL LEVEL
SUPPRESSION:	SERIAL LEVEL
----- CALCULATED DATA -----	
RDS/SQ YD:	TARGET LEVEL
RDS/SQ YD/MIN:	TARGET LEVEL
LBS/SQ YD:	TARGET LEVEL
LBS/SQ YD/MIN:	TARGET LEVEL
LBS/SQ YD (EQ):	TARGET LEVEL
LBS/SQ YD/MIN (EQ):	TARGET LEVEL

## SERIAL

SERIAL: 26  
 REF NUMBER: A10  
 ORIG REF: 1ORS 1/25C7  
 REF TITLE: THE EFFECT OF ARTILLERY FIRE  
 DATA SOURCE: ACTION REPORT

----- SERIAL DATA -----

SIDE 1 COUNTRY: BRITAIN  
 SIDE 1 UNITS: 1 INF BN, 2 FD REGT, 1 MD REGT, 1 HV REGT  
 SIDE 1 POSTURE: ATTACKING  
 SIDE 2 COUNTRY: GERMANY  
 SIDE 2 UNITS: ??  
 SIDE 2 POSTURE: DEFENDING

DATE OF ACTION: 10/20/44  
 COUNTRY: ITALY  
 REGION: C SALARO  
 TERRAIN: MOUNTAINOUS  
 WEATHER: ??  
 TIME: 2350

SERIAL TACTICS: INFANTRY ATTACK GERMAN POSITION

NO. BMBRD TARGETS: 6  
 NO. PHASES/TGT: 1/1/1/1/1/1

----- TARGET DATA -----

BOMBARD TARGET: PHASE LEVEL

BOMBARD TGT AREA: PHASE LEVEL  
 BOMBARD TACTICS: TARGET LEVEL

----- FIRING DATA -----

FIRE UNIT: PHASE LEVEL  
 TYPE WEAPONS: PHASE LEVEL  
 NUMBER TUBES: PHASE LEVEL  
 TYPE AMMO: PHASE LEVEL  
 ROUNDS PER GUN: PHASE LEVEL  
 NUMBER ROUNDS: PHASE LEVEL  
 FIRE DURATION: TARGET LEVEL AND PHASE LEVEL

----- RESULTS DATA -----

ATTACK DELAY TIME: 10 MINUTES (FROM H HOUR)  
 TIME TO OBJECTIVE: ATTACK FAILED  
 CASUALTIES: UNKNOWN (GERMAN); UNKNOWN (BRITISH)  
 EQUIPMENT DAMAGE: ??; ??  
 OTHER FACTORS: ATTACK FAILED DUE TO UNKNOWN MG NEST

OTHER RESULTS: ??  
 SUPPRESSION: GERMANS ON PT392 WERE NOT SUPPRESSED BECAUSE THEY WERE NOT SHELLED; NO EVIDENCE ON EFFECT OF OTHER SHOTS

----- CALCULATED DATA -----

RDS/SQ YD: PHASE LEVEL  
 RDS/SQ YD/MIN: PHASE LEVEL  
 LBS/SQ YD: PHASE LEVEL  
 LBS/SQ YD/MIN: PHASE LEVEL  
 LBS/SQ YD (EQ): PHASE LEVEL  
 LBS/SQ YD/MIN (EQ): PHASE LEVEL

## TARGET

SERIAL:	28
TARGET NUMBER:	1
NUMBER PHASES:	1
TIME:	2350
----- TARGET DATA -----	
TARGET:	PHASE LEVEL
TARGET AREA:	PHASE LEVEL
TARGET TACTICS:	BOMBARD GERMAN POSITION
----- FIRING DATA -----	
FIRE UNIT:	PHASE LEVEL
TYPE WEAPONS:	PHASE LEVEL
NUMBER TUBES:	PHASE LEVEL
TYPE AMMO:	PHASE LEVEL
ROUNDS PER GUN:	PHASE LEVEL
NUMBER ROUNDS:	PHASE LEVEL
FIRE DURATION:	10
----- RESULTS DATA -----	
ATTACK DELAY TIME:	SERIAL LEVEL
TIME TO OBJECTIVE:	SERIAL LEVEL
CASUALTIES:	SERIAL LEVEL
EQUIPMENT DAMAGE:	SERIAL LEVEL
OTHER FACTORS:	SERIAL LEVEL
OTHER RESULTS:	SERIAL LEVEL
SUPPRESSION:	SERIAL LEVEL
----- CALCULATED DATA -----	
RDS/SQ YD:	PHASE LEVEL
RDS/SQ YD/MIN:	PHASE LEVEL
LBS/SQ YD:	PHASE LEVEL
LBS/SQ YD/MIN:	PHASE LEVEL
LBS/SQ YD (EQ):	PHASE LEVEL
LBS/SQ YD/MIN (EQ):	PHASE LEVEL

## PHASE

SERIAL:	28
TARGET NUMBER:	1
PHASE NUMBER:	1
TIME:	2350
----- TARGET DATA -----	
TARGET:	GERMAN POSITION
TARGET AREA:	??
PHASE TACTICS:	??
----- FIRING DATA -----	
FIRE UNIT:	1 FD REGT
TYPE WEAPONS:	??
NUMBER TUBES:	??
TYPE AMMO:	??
ROUNDS PER GUN:	??
NUMBER ROUNDS:	480??
FIRE DURATION:	10
----- RESULTS DATA -----	
ATTACK DELAY TIME:	SERIAL LEVEL
TIME TO OBJECTIVE:	SERIAL LEVEL
CASUALTIES:	SERIAL LEVEL
EQUIPMENT DAMAGE:	SERIAL LEVEL
OTHER FACTORS:	SERIAL LEVEL
OTHER RESULTS:	SERIAL LEVEL
SUPPRESSION:	SERIAL LEVEL
----- CALCULATED DATA -----	
RDS/SQ YD:	??
RDS/SQ YD/MIN:	??
LBS/SQ YD:	??
LBS/SQ YD/MIN:	??
LBS/SQ YD (EQ):	??
LBS/SQ YD/MIN (EQ):	??

## TARGET

```
SERIAL: 26
TARGET NUMBER: 2
NUMBER PHASES: 1
TIME: 2400
----- TARGET DATA -----
TARGET: PHASE LEVEL
TARGET AREA: PHASE LEVEL
TARGET TACTICS: BOMBARD GERMAN POSITION
----- FIRING DATA -----
FIRE UNIT: PHASE LEVEL
TYPE WEAPONS: PHASE LEVEL
NUMBER TUBES: PHASE LEVEL
TYPE AMMO: PHASE LEVEL
ROUNDS PER GUN: PHASE LEVEL
NUMBER ROUNDS: PHASE LEVEL
FIRE DURATION: 30
----- RESULTS DATA -----
ATTACK DELAY TIME: SERIAL LEVEL
TIME TO OBJECTIVE: SERIAL LEVEL
CASUALTIES: SERIAL LEVEL
EQUIPMENT DAMAGE: SERIAL LEVEL
OTHER FACTORS: SERIAL LEVEL
OTHER RESULTS: SERIAL LEVEL
SUPPRESSION: SERIAL LEVEL
----- CALCULATED DATA -----
RDS/SQ YD: PHASE LEVEL
RDS/SQ YD/MIN: PHASE LEVEL
LBS/SQ YD: PHASE LEVEL
LBS/SQ YD/MIN: PHASE LEVEL
LBS/SQ YD (EQ): PHASE LEVEL
LBS/SQ YD/MIN (EQ): PHASE LEVEL
```

## PHASE

```
SERIAL: 28
TARGET NUMBER: 2
PHASE NUMBER: 1
TIME: 2400
----- TARGET DATA -----
TARGET: GERMAN POSITION
TARGET AREA: ??
PHASE TACTICS: ??
----- FIRING DATA -----
FIRE UNIT: 1 FD REGT
TYPE WEAPONS: ??
NUMBER TUBES: ??
TYPE AMMO: ??
ROUNDS PER GUN: ??
NUMBER ROUNDS: 1440??
FIRE DURATION: 30
----- RESULTS DATA -----
ATTACK DELAY TIME: SERIAL LEVEL
TIME TO OBJECTIVE: SERIAL LEVEL
CASUALTIES: SERIAL LEVEL
EQUIPMENT DAMAGE: SERIAL LEVEL
OTHER FACTORS: SERIAL LEVEL
OTHER RESULTS: SERIAL LEVEL
SUPPRESSION: SERIAL LEVEL
----- CALCULATED DATA -----
RDS/SQ YD: ??
RDS/SQ YD/MIN: ??
LBS/SQ YD: ??
LBS/SQ YD/MIN: ??
LBS/SQ YD (EQ): ??
LBS/SQ YD/MIN (EQ): ??
```

## TARGET

SERIAL:	26
TARGET NUMBER:	3
NUMBER PHASES:	1
TIME:	2400
----- TARGET DATA -----	
TARGET:	PHASE LEVEL
TARGET AREA:	PHASE LEVEL
TARGET TACTICS:	BOMBARD GERMAN POSITION
----- FIRING DATA -----	
FIRE UNIT:	PHASE LEVEL
TYPE WEAPONS:	PHASE LEVEL
NUMBER TUBES:	PHASE LEVEL
TYPE AMMO:	PHASE LEVEL
ROUNDS PER GUN:	PHASE LEVEL
NUMBER ROUNDS:	PHASE LEVEL
FIRE DURATION:	30
----- RESULTS DATA -----	
ATTACK DELAY TIME:	SERIAL LEVEL
TIME TO OBJECTIVE:	SERIAL LEVEL
CASUALTIES:	SERIAL LEVEL
EQUIPMENT DAMAGE:	SERIAL LEVEL
OTHER FACTORS:	SERIAL LEVEL
OTHER RESULTS:	SERIAL LEVEL
SUPPRESSION:	SERIAL LEVEL
----- CALCULATED DATA -----	
RDS/SQ YD:	PHASE LEVEL
RDS/SQ YD/MIN:	PHASE LEVEL
LBS/SQ YD:	PHASE LEVEL
LBS/SQ YD/MIN:	PHASE LEVEL
LBS/SQ YD (EQ):	PHASE LEVEL
LBS/SQ YD/MIN (EQ):	PHASE LEVEL

## PHASE

SERIAL:	26
TARGET NUMBER:	3
PHASE NUMBER:	1
TIME:	2400
----- TARGET DATA -----	
TARGET:	GERMAN POSITION
TARGET AREA:	??
PHASE TACTICS:	??
----- FIRING DATA -----	
FIRE UNIT:	1 FD REGT
TYPE WEAPONS:	??
NUMBER TUBES:	??
TYPE AMMO:	??
ROUNDS PER GUN:	??
NUMBER ROUNDS:	1440??
FIRE DURATION:	30
----- RESULTS DATA -----	
ATTACK DELAY TIME:	SERIAL LEVEL
TIME TO OBJECTIVE:	SERIAL LEVEL
CASUALTIES:	SERIAL LEVEL
EQUIPMENT DAMAGE:	SERIAL LEVEL
OTHER FACTORS:	SERIAL LEVEL
OTHER RESULTS:	SERIAL LEVEL
SUPPRESSION:	SERIAL LEVEL
----- CALCULATED DATA -----	
RDS/SQ YD:	??
RDS/SQ YD/MIN:	??
LBS/SQ YD:	??
LBS/SQ YD/MIN:	??
LBS/SQ YD (EQ):	??
LBS/SQ YD/MIN (EQ):	??

## TARGET

SERIAL: 26  
TARGET NUMBER: 4  
NUMBER PHASES: 1  
TIME: 0030

----- TARGET DATA -----  
TARGET: PHASE LEVEL

TARGET AREA: PHASE LEVEL  
TARGET TACTICS: BOMBARD GERMAN POSITION

----- FIRING DATA -----  
FIRE UNIT: PHASE LEVEL  
TYPE WEAPONS: PHASE LEVEL  
NUMBER TUBES: PHASE LEVEL  
TYPE AMMO: PHASE LEVEL  
ROUNDS PER GUN: PHASE LEVEL  
NUMBER ROUNDS: PHASE LEVEL  
FIRE DURATION: 30

----- RESULTS DATA -----  
ATTACK DELAY TIME: SERIAL LEVEL  
TIME TO OBJECTIVE: SERIAL LEVEL  
CASUALTIES: SERIAL LEVEL  
EQUIPMENT DAMAGE: SERIAL LEVEL  
OTHER FACTORS: SERIAL LEVEL

OTHER RESULTS: SERIAL LEVEL  
SUPPRESSION: SERIAL LEVEL

----- CALCULATED DATA -----  
RDS/SQ YD: PHASE LEVEL  
RDS/SQ YD/MIN: PHASE LEVEL  
LBS/SQ YD: PHASE LEVEL  
LBS/SQ YD/MIN: PHASE LEVEL  
LBS/SQ YD (EQ): PHASE LEVEL  
LBS/SQ YD/MIN (EQ): PHASE LEVEL

## PHASE

SERIAL: 26  
TARGET NUMBER: 4  
PHASE NUMBER: 1  
TIME: 0030

----- TARGET DATA -----  
TARGET: GERMAN POSITION

TARGET AREA: ??  
PHASE TACTICS: ??

----- FIRING DATA -----  
FIRE UNIT: 1 FD REGT  
TYPE WEAPONS: ??  
NUMBER TUBES: ??  
TYPE AMMO: ??  
ROUNDS PER GUN: ??  
NUMBER ROUNDS: 1440??  
FIRE DURATION: 30

----- RESULTS DATA -----  
ATTACK DELAY TIME: SERIAL LEVEL  
TIME TO OBJECTIVE: SERIAL LEVEL  
CASUALTIES: SERIAL LEVEL  
EQUIPMENT DAMAGE: SERIAL LEVEL  
OTHER FACTORS: SERIAL LEVEL

OTHER RESULTS: SERIAL LEVEL  
SUPPRESSION: SERIAL LEVEL

----- CALCULATED DATA -----  
RDS/SQ YD: ??  
RDS/SQ YD/MIN: ??  
LBS/SQ YD: ??  
LBS/SQ YD/MIN: ??  
LBS/SQ YD (EQ): ??  
LBS/SQ YD/MIN (EQ): ??

## TARGET

SERIAL:	26
TARGET NUMBER:	5
NUMBER PHASES:	1
TIME:	0030
----- TARGET DATA -----	
TARGET:	PHASE LEVEL
TARGET AREA:	PHASE LEVEL
TARGET TACTICS:	BOMBARD GERMAN POSITION
----- FIRING DATA -----	
FIRE UNIT:	PHASE LEVEL
TYPE WEAPONS:	PHASE LEVEL
NUMBER TUBES:	PHASE LEVEL
TYPE AMMO:	PHASE LEVEL
ROUNDS PER GUN:	PHASE LEVEL
NUMBER ROUNDS:	PHASE LEVEL
FIRE DURATION:	30
----- RESULTS DATA -----	
ATTACK DELAY TIME:	SERIAL LEVEL
TIME TO OBJECTIVE:	SERIAL LEVEL
CASUALTIES:	SERIAL LEVEL
EQUIPMENT DAMAGE:	SERIAL LEVEL
OTHER FACTORS:	SERIAL LEVEL
OTHER RESULTS:	SERIAL LEVEL
SUPPRESSION:	SERIAL LEVEL
----- CALCULATED DATA -----	
RDS/SQ YD:	PHASE LEVEL
RCS/SQ YD/MIN:	PHASE LEVEL
LBS/SQ YD:	PHASE LEVEL
LBS/SQ YD/MIN:	PHASE LEVEL
LBS/SQ YD (EQ):	PHASE LEVEL
LBS/SQ YD/MIN (EQ):	PHASE LEVEL

## PHASE

SERIAL:	26
TARGET NUMBER:	5
PHASE NUMBER:	1
TIME:	0030
----- TARGET DATA -----	
TARGET:	GERMAN POSITION
TARGET AREA:	??
PHASE TACTICS:	??
----- FIRING DATA -----	
FIRE UNIT:	1 FD REGT
TYPE WEAPONS:	??
NUMBER TUBES:	??
TYPE AMMO:	??
ROUNDS PER GUN:	??
NUMBER ROUNDS:	1440??
FIRE DURATION:	30
----- RESULTS DATA -----	
ATTACK DELAY TIME:	SERIAL LEVEL
TIME TO OBJECTIVE:	SERIAL LEVEL
CASUALTIES:	SERIAL LEVEL
EQUIPMENT DAMAGE:	SERIAL LEVEL
OTHER FACTORS:	SERIAL LEVEL
OTHER RESULTS:	SERIAL LEVEL
SUPPRESSION:	SERIAL LEVEL
----- CALCULATED DATA -----	
RDS/SQ YD:	??
RDS/SQ YD/MIN:	??
LBS/SQ YD:	??
LBS/SQ YD/MIN:	??
LBS/SQ YD (EQ):	??
LBS/SQ YD/MIN (EQ):	??

## TARGET

SERIAL: 28  
TARGET NUMBER: 6  
NUMBER PHASES: 1  
TIME: 2400

----- TARGET DATA -----  
TARGET: PHASE LEVEL

TARGET AREA: PHASE LEVEL  
TARGET TACTICS: BOMBARD GERMAN POSITION

----- FIRING DATA -----  
FIRE UNIT: PHASE LEVEL  
TYPE WEAPONS: PHASE LEVEL  
NUMBER TUBES: PHASE LEVEL  
TYPE AMMO: PHASE LEVEL  
ROUNDS PER GUN: PHASE LEVEL  
NUMBER ROUNDS: PHASE LEVEL  
FIRE DURATION: 120

----- RESULTS DATA -----  
ATTACK DELAY TIME: SERIAL LEVEL  
TIME TO OBJECTIVE: SERIAL LEVEL  
CASUALTIES: SERIAL LEVEL  
EQUIPMENT DAMAGE: SERIAL LEVEL  
OTHER FACTORS: SERIAL LEVEL

OTHER RESULTS: SERIAL LEVEL  
SUPPRESSION: SERIAL LEVEL

----- CALCULATED DATA -----  
RDS/SQ YD: PHASE LEVEL  
RDS/SQ YD/MIN: PHASE LEVEL  
LBS/SQ YD: PHASE LEVEL  
LBS/SQ YD/MIN: PHASE LEVEL  
LBS/SQ YD (EQ): PHASE LEVEL  
LBS/SQ YD/MIN (EQ): PHASE LEVEL

## PHASE

SERIAL: 26  
TARGET NUMBER: 6  
PHASE NUMBER: 1  
TIME: 2400

----- TARGET DATA -----  
TARGET: GERMAN POSITION

TARGET AREA: ??  
PHASE TACTICS: ??

----- FIRING DATA -----  
FIRE UNIT: 1 MD REGT, 1 MV REGT  
TYPE WEAPONS: ??  
NUMBER TUBES: ??  
TYPE AMMO: ??  
ROUNDS PER GUN: ??  
NUMBER ROUNDS: 260??  
FIRE DURATION: 120

----- RESULTS DATA -----  
ATTACK DELAY TIME: SERIAL LEVEL  
TIME TO OBJECTIVE: SERIAL LEVEL  
CASUALTIES: SERIAL LEVEL  
EQUIPMENT DAMAGE: SERIAL LEVEL  
OTHER FACTORS: SERIAL LEVEL

OTHER RESULTS: SERIAL LEVEL  
SUPPRESSION: SERIAL LEVEL

----- CALCULATED DATA -----  
RDS/SQ YD: ??  
RDS/SQ YD/MIN: ??  
LBS/SQ YD: ??  
LBS/SQ YD/MIN: ??  
LBS/SQ YD (EQ): ??  
LBS/SQ YD/MIN (EQ): ??



## SERIAL

SERIAL:	27
REF NUMBER:	A10
ORIG REF:	10RS 1/25C8
REF TITLE:	THE EFFECT OF ARTILLERY FIRE
DATA SOURCE:	ACTION REPORTS
----- SERIAL DATA -----	
SIDE 1 COUNTRY:	BRITAIN
SIDE 1 UNITS:	1 BOE
SIDE 1 POSTURE:	ATTACKING
SIDE 2 COUNTRY:	GERMANY
SIDE 2 UNITS:	??
SIDE 2 POSTURE:	DEFENDING
DATE OF ACTION:	10/21/44
COUNTRY:	ITALY
REGION:	FONTANELICE
TERRAIN:	RIDGE AND CLIFF
WEATHER:	??
TIME:	1900
SERIAL TACTICS:	ATTACK GERMAN POSITION ON BARE GRASSY RIDGE WITH A RUINED HOUSE WITH OUT BOMB TO ACHIEVE SURPRISE
NO. BMBRD TARGETS:	N/A
NO. PHASES/TGT:	N/A
----- TARGET DATA -----	
BOMBARD TARGET:	N/A
BOMBARD TGT AREA:	N/A
BOMBARD TACTICS:	N/A
----- FIRING DATA -----	
FIRE UNIT:	N/A
TYPE WEAPONS:	N/A
NUMBER TUBES:	N/A
TYPE AMMO:	N/A
ROUNDS PER GUN:	N/A
NUMBER ROUNDS:	N/A
FIRE DURATION:	N/A
----- RESULTS DATA -----	
ATTACK DELAY TIME:	N/A
TIME TO OBJECTIVE:	N/A
CASUALTIES:	5 POW (GERMAN);?? (BRITISH)
EQUIPMENT DAMAGE:	??;??
OTHER FACTORS:	GERMANS WERE SURPRISED;GERMANS WERE USED TO ATTACKS BEING PRECEDED B Y ARTY BOMBARDMENTS
OTHER RESULTS:	POSITION CAPTURED;UNABLE TO EXPLOIT SUCCESS DUE TO DARKNESS AND RAIN
SUPPRESSION:	N/A
----- CALCULATED DATA -----	
RDS/SQ YD:	N/A
RDS/SQ YD/MIN:	N/A
LBS/SQ YD:	N/A
LBS/SQ YD/MIN:	N/A
LBS/SQ YD (EQ):	N/A
LBS/SQ YD/MIN (EQ):	N/A



SERIAL

SERIAL: 28  
 REF NUMBER: A10  
 ORIG REF: 10RS 1/25C9  
 REF TITLE: THE EFFECT OF ARTILLERY FIRE  
 DATA SOURCE: ACTION REPORTS

----- SERIAL DATA -----

SIDE 1 COUNTRY: BRITAIN  
 SIDE 1 UNITS: 3 BN, 3 FD REGTS, 1 FD BATT, 2 MD BATT, 1 HV BATT  
 SIDE 1 POSTURE: ATTACKING  
 SIDE 2 COUNTRY: GERMANY  
 SIDE 2 UNITS: 2 COYS  
 SIDE 2 POSTURE: DEFENDING

DATE OF ACTION: 10/23/44  
 COUNTRY: ITALY  
 REGION: FONTANELICE  
 TERRAIN: RIDGES WITH STEEP SLOPES  
 WEATHER: ??  
 TIME: 2230

SERIAL TACTICS: ATTACK VARIOUS GERMAN POSITIONS AND EXPLOIT

NO. BMBRD TARGETS: 6  
 NO. PHASES/TGT: 2/2/4/2/1/3

----- TARGET DATA -----

BOMBARD TARGET: TARGET/TARGET/TARGET/TARGET/PHASE/TARGET

BOMBARD TGT AREA: TARGET/TARGET/TARGET/TARGET/PHASE/TARGET

BOMBARD TACTICS: TARGET LEVEL

----- FIRING DATA -----

FIRE UNIT: PHASE LEVEL  
 TYPE WEAPONS: PHASE LEVEL  
 NUMBER TUBES: PHASE LEVEL  
 TYPE AMMO: PHASE LEVEL  
 ROUNDS PER GUN: PHASE LEVEL  
 NUMBER ROUNDS: PHASE LEVEL  
 FIRE DURATION: TARGET LEVEL AND PHASE LEVEL

----- RESULTS DATA -----

ATTACK DELAY TIME: NO DELAY  
 TIME TO OBJECTIVE: 2 MINUTES  
 CASUALTIES: 144 POW (GERMAN); SLIGHT CASUALTIES (BRITISH)  
 EQUIPMENT DAMAGE: ??; ??  
 OTHER FACTORS: NONE

OTHER RESULTS: ALL OBJECTIVES WERE TAKEN  
 SUPPRESSION: GERMANS WERE SUPPRESSED; INFANTRY REACHED THEM BEFORE THEY HAD TIME TO TAKE UP THEIR WEAPONS

----- CALCULATED DATA -----

RDS/SQ YD: TARGET/TARGET/TARGET/TARGET/PHASE/TARGET  
 RDS/SQ YD/MIN: TARGET/TARGET/TARGET/TARGET/PHASE/TARGET  
 LBS/SQ YD: TARGET/TARGET/TARGET/TARGET/PHASE/TARGET  
 LBS/SQ YD/MIN: TARGET/TARGET/TARGET/TARGET/PHASE/TARGET  
 LBS/SQ YD (EQ): TARGET/TARGET/TARGET/TARGET/PHASE/TARGET  
 LBS/SQ YD/MIN (EQ): TARGET/TARGET/TARGET/TARGET/PHASE/TARGET

## TARGET

SERIAL:	20
TARGET NUMBER:	1
NUMBER PHASES:	2
TIME:	2150
----- TARGET DATA -----	
TARGET:	PT380
TARGET AREA:	20000
TARGET TACTICS:	BOMBARD PT380
----- FIRING DATA -----	
FIRE UNIT:	PHASE LEVEL
TYPE WEAPONS:	PHASE LEVEL
NUMBER TUBES:	PHASE LEVEL
TYPE AMMO:	PHASE LEVEL
ROUNDS PER GUN:	PHASE LEVEL
NUMBER ROUNDS:	PHASE LEVEL
FIRE DURATION:	67
----- RESULTS DATA -----	
ATTACK DELAY TIME:	SERIAL LEVEL
TIME TO OBJECTIVE:	SERIAL LEVEL
CASUALTIES:	SERIAL LEVEL
EQUIPMENT DAMAGE:	SERIAL LEVEL
OTHER FACTORS:	SERIAL LEVEL
OTHER RESULTS:	SERIAL LEVEL
SUPPRESSION:	SERIAL LEVEL
----- CALCULATED DATA -----	
RDS/SQ YD:	0.01A, 0.00052F, 0.0004H
RDS/SQ YD/MIN:	??A, ??F, ??H
LBS/SQ YD:	0.25A, 0.042F, 0.00H
LBS/SQ YD/MIN:	??A, ??F, ??H
LBS/SQ YD (EQ):	0.25A, 0.0340F, 0.0302H
LBS/SQ YD/MIN (EQ):	??A, ??F, ??H

## PHASE

SERIAL:	20
TARGET NUMBER:	1
PHASE NUMBER:	1
TIME:	2150
----- TARGET DATA -----	
TARGET:	TARGET LEVEL
TARGET AREA:	TARGET LEVEL
PHASE TACTICS:	CONCENTRATION
----- FIRING DATA -----	
FIRE UNIT:	1 MD BATT, 1 MV BATT
TYPE WEAPONS:	F, H
NUMBER TUBES:	7F, 8H
TYPE AMMO:	??F, ??H
ROUNDS PER GUN:	2.1F, 1.4H
NUMBER ROUNDS:	14.7F, 11.2H
FIRE DURATION:	32
----- RESULTS DATA -----	
ATTACK DELAY TIME:	SERIAL LEVEL
TIME TO OBJECTIVE:	SERIAL LEVEL
CASUALTIES:	SERIAL LEVEL
EQUIPMENT DAMAGE:	SERIAL LEVEL
OTHER FACTORS:	SERIAL LEVEL
OTHER RESULTS:	SERIAL LEVEL
SUPPRESSION:	SERIAL LEVEL
----- CALCULATED DATA -----	
RDS/SQ YD:	TARGET LEVEL
RDS/SQ YD/MIN:	TARGET LEVEL
LBS/SQ YD:	TARGET LEVEL
LBS/SQ YD/MIN:	TARGET LEVEL
LBS/SQ YD (EQ):	TARGET LEVEL
LBS/SQ YD/MIN (EQ):	TARGET LEVEL

## PHASE

SERIAL:	28
TARGET NUMBER:	1
PHASE NUMBER:	2
TIME:	2230
----- TARGET DATA -----	
TARGET:	TARGET LEVEL
TARGET AREA:	TARGET LEVEL
PHASE TACTICS:	CONCENTRATION
----- FIRING DATA -----	
FIRE UNIT:	1 FD BATT
TYPE WEAPONS:	A
NUMBER TUBES:	8A
TYPE AMMO:	??A
ROUNDS PER GUN:	35A
NUMBER ROUNDS:	280A
FIRE DURATION:	35
----- RESULTS DATA -----	
ATTACK DELAY TIME:	SERIAL LEVEL
TIME TO OBJECTIVE:	SERIAL LEVEL
CASUALTIES:	SERIAL LEVEL
EQUIPMENT DAMAGE:	SERIAL LEVEL
OTHER FACTORS:	SERIAL LEVEL
OTHER RESULTS:	SERIAL LEVEL
SUPPRESSION:	SERIAL LEVEL
----- CALCULATED DATA -----	
RDS/SQ YD:	TARGET LEVEL
RDS/SQ YD/MIN:	TARGET LEVEL
LBS/SQ YD:	TARGET LEVEL
LBS/SQ YD/MIN:	TARGET LEVEL
LBS/SQ YD (EQ):	TARGET LEVEL
LBS/SQ YD/MIN (EQ):	TARGET LEVEL

## TARGET

SERIAL:	28
TARGET NUMBER:	2
NUMBER PHASES:	2
TIME:	2150
----- TARGET DATA -----	
TARGET:	PT289
TARGET AREA:	28000
TARGET TACTICS:	BOMBARD PT289
----- FIRING DATA -----	
FIRE UNIT:	PHASE LEVEL
TYPE WEAPONS:	PHASE LEVEL
NUMBER TUBES:	PHASE LEVEL
TYPE AMMO:	PHASE LEVEL
ROUNDS PER GUN:	PHASE LEVEL
NUMBER ROUNDS:	PHASE LEVEL
FIRE DURATION:	117
----- RESULTS DATA -----	
ATTACK DELAY TIME:	SERIAL LEVEL
TIME TO OBJECTIVE:	SERIAL LEVEL
CASUALTIES:	SERIAL LEVEL
EQUIPMENT DAMAGE:	SERIAL LEVEL
OTHER FACTORS:	SERIAL LEVEL
OTHER RESULTS:	SERIAL LEVEL
SUPPRESSION:	SERIAL LEVEL
----- CALCULATED DATA -----	
RDS/SQ YD:	0.02A, 0.00105F
RDS/SQ YD/MIN:	??A, ??F
LBS/SQ YD:	0.5A, 0.084F
LBS/SQ YD/MIN:	??A, ??F
LBS/SQ YD (EQ):	0.5A, 0.0897F
LBS/SQ YD/MIN (EQ):	??A, ??F

## PHASE

SERIAL: 28  
TARGET NUMBER: 2  
PHASE NUMBER: 1  
TIME: 2158

----- TARGET DATA -----  
TARGET: TARGET LEVEL

TARGET AREA: TARGET LEVEL  
PHASE TACTICS: CONCENTRATION

----- FIRING DATA -----  
FIRE UNIT: 1 MD BATT  
TYPE WEAPONS: F  
NUMBER TUBES: 7F  
TYPE AMMO: ??F  
ROUNDS PER GUN: 4.2F  
NUMBER ROUNDS: 29.4F  
FIRE DURATION: 36

----- RESULTS DATA -----  
ATTACK DELAY TIME: SERIAL LEVEL  
TIME TO OBJECTIVE: SERIAL LEVEL  
CASUALTIES: SERIAL LEVEL  
EQUIPMENT DAMAGE: SERIAL LEVEL  
OTHER FACTORS: SERIAL LEVEL

OTHER RESULTS: SERIAL LEVEL  
SUPPRESSION: SERIAL LEVEL

----- CALCULATED DATA -----  
RDS/SQ YD: TARGET LEVEL  
RDS/SQ YD/MIN: TARGET LEVEL  
LBS/SQ YD: TARGET LEVEL  
LBS/SQ YD/MIN: TARGET LEVEL  
LBS/SQ YD (EQ): TARGET LEVEL  
LBS/SQ YD/MIN (EQ): TARGET LEVEL

## PHASE

SERIAL: 28  
TARGET NUMBER: 2  
PHASE NUMBER: 2  
TIME: 2230

----- TARGET DATA -----  
TARGET: TARGET LEVEL

TARGET AREA: TARGET LEVEL  
PHASE TACTICS: CONCENTRATION

----- FIRING DATA -----  
FIRE UNIT: 1 FD BATT  
TYPE WEAPONS: A  
NUMBER TUBES: 8A  
TYPE AMMO: ??A  
ROUNDS PER GUN: 70A  
NUMBER ROUNDS: 560A  
FIRE DURATION: 85

----- RESULTS DATA -----  
ATTACK DELAY TIME: SERIAL LEVEL  
TIME TO OBJECTIVE: SERIAL LEVEL  
CASUALTIES: SERIAL LEVEL  
EQUIPMENT DAMAGE: SERIAL LEVEL  
OTHER FACTORS: SERIAL LEVEL

OTHER RESULTS: SERIAL LEVEL  
SUPPRESSION: SERIAL LEVEL

----- CALCULATED DATA -----  
RDS/SQ YD: TARGET LEVEL  
RDS/SQ YD/MIN: TARGET LEVEL  
LBS/SQ YD: TARGET LEVEL  
LBS/SQ YD/MIN: TARGET LEVEL  
LBS/SQ YD (EQ): TARGET LEVEL  
LBS/SQ YD/MIN (EQ): TARGET LEVEL

## TARGET

SERIAL:	28
TARGET NUMBER:	3
NUMBER PHASES:	4
TIME:	2158
----- TARGET DATA -----	
TARGET:	PT298
TARGET AREA:	112000
TARGET TACTICS:	BOMBARD PT298
----- FIRING DATA -----	
FIRE UNIT:	PHASE LEVEL
TYPE WEAPONS:	PHASE LEVEL
NUMBER TUBES:	PHASE LEVEL
TYPE AMMO:	PHASE LEVEL
ROUNDS PER GUN:	PHASE LEVEL
NUMBER ROUNDS:	PHASE LEVEL
FIRE DURATION:	134
----- RESULTS DATA -----	
ATTACK DELAY TIME:	SERIAL LEVEL
TIME TO OBJECTIVE:	SERIAL LEVEL
CASUALTIES:	SERIAL LEVEL
EQUIPMENT DAMAGE:	SERIAL LEVEL
OTHER FACTORS:	SERIAL LEVEL
OTHER RESULTS:	SERIAL LEVEL
SUPPRESSION:	SERIAL LEVEL
----- CALCULATED DATA -----	
RDS/SQ YD:	0.0151A,0.000263F
RDS/SQ YD/MIN:	??A,??F
LBS/SQ YD:	0.377A,0.021F
LBS/SQ YD/MIN:	??A,??F
LBS/SQ YD (EQ):	0.377A,0.0174F
LBS/SQ YD/MIN (EQ):	??A,??F

## PHASE

SERIAL:	29
TARGET NUMBER:	3
PHASE NUMBER:	1
TIME:	2158
----- TARGET DATA -----	
TARGET:	TARGET LEVEL
TARGET AREA:	TARGET LEVEL
PHASE TACTICS:	CONCENTRATION
----- FIRING DATA -----	
FIRE UNIT:	1 MD BATT
TYPE WEAPONS:	F
NUMBER TUBES:	7F
TYPE AMMO:	??F
ROUNDS PER GUN:	4.2F
NUMBER ROUNDS:	29.4F
FIRE DURATION:	38
----- RESULTS DATA -----	
ATTACK DELAY TIME:	SERIAL LEVEL
TIME TO OBJECTIVE:	SERIAL LEVEL
CASUALTIES:	SERIAL LEVEL
EQUIPMENT DAMAGE:	SERIAL LEVEL
OTHER FACTORS:	SERIAL LEVEL
OTHER RESULTS:	SERIAL LEVEL
SUPPRESSION:	SERIAL LEVEL
----- CALCULATED DATA -----	
RDS/SQ YD:	TARGET LEVEL
RDS/SQ YD/MIN:	TARGET LEVEL
LBS/SQ YD:	TARGET LEVEL
LBS/SQ YD/MIN:	TARGET LEVEL
LBS/SQ YD (EQ):	TARGET LEVEL
LBS/SQ YD/MIN (EQ):	TARGET LEVEL

## PHASE

SERIAL:	28
TARGET NUMBER:	3
PHASE NUMBER:	2
TIME:	2230
----- TARGET DATA -----	
TARGET:	TARGET LEVEL
TARGET AREA:	TARGET LEVEL
PHASE TACTICS:	CONCENTRATION
----- FIRING DATA -----	
FIRE UNIT:	1 FD BATT
TYPE WEAPONS:	A
NUMBER TUBES:	3A
TYPE AMMO:	??A
ROUNDS PER GUN:	70A
NUMBER ROUNDS:	560A
FIRE DURATION:	85
----- RESULTS DATA -----	
ATTACK DELAY TIME:	SERIAL LEVEL
TIME TO OBJECTIVE:	SERIAL LEVEL
CASUALTIES:	SERIAL LEVEL
EQUIPMENT DAMAGE:	SERIAL LEVEL
OTHER FACTORS:	SERIAL LEVEL
OTHER RESULTS:	SERIAL LEVEL
SUPPRESSION:	SERIAL LEVEL
----- CALCULATED DATA -----	
RDS/SQ YD:	TARGET LEVEL
RDS/SQ YD/MIN:	TARGET LEVEL
LBS/SQ YD:	TARGET LEVEL
LBS/SQ YD/MIN:	TARGET LEVEL
LBS/SQ YD (EQ):	TARGET LEVEL
LBS/SQ YD/MIN (EQ):	TARGET LEVEL

## PHASE

SERIAL:	28
TARGET NUMBER:	3
PHASE NUMBER:	3
TIME:	2358
----- TARGET DATA -----	
TARGET:	TARGET LEVEL
TARGET AREA:	TARGET LEVEL
PHASE TACTICS:	CONCENTRATION
----- FIRING DATA -----	
FIRE UNIT:	2 FD REGT
TYPE WEAPONS:	A
NUMBER TUBES:	48A
TYPE AMMO:	??A
ROUNDS PER GUN:	11.5A
NUMBER ROUNDS:	552A
FIRE DURATION:	5
----- RESULTS DATA -----	
ATTACK DELAY TIME:	SERIAL LEVEL
TIME TO OBJECTIVE:	SERIAL LEVEL
CASUALTIES:	SERIAL LEVEL
EQUIPMENT DAMAGE:	SERIAL LEVEL
OTHER FACTORS:	SERIAL LEVEL
OTHER RESULTS:	SERIAL LEVEL
SUPPRESSION:	SERIAL LEVEL
----- CALCULATED DATA -----	
RDS/SQ YD:	TARGET LEVEL
RDS/SQ YD/MIN:	TARGET LEVEL
LBS/SQ YD:	TARGET LEVEL
LBS/SQ YD/MIN:	TARGET LEVEL
LBS/SQ YD (EQ):	TARGET LEVEL
LBS/SQ YD/MIN (EQ):	TARGET LEVEL

## PHASE

SERIAL:	28
TARGET NUMBER:	3
PHASE NUMBER:	4
TIME:	0004
----- TARGET DATA -----	
TARGET:	TARGET LEVEL
TARGET AREA:	TARGET LEVEL
PHASE TACTICS:	CONCENTRATION
----- FIRING DATA -----	
FIRE UNIT:	1 FO REGT
TYPE WEAPONS:	A
NUMBER TUBES:	24A
TYPE AMMO:	??A
ROUNDS PER GUN:	24A
NUMBER ROUNDS:	576A
FIRE DURATION:	8
----- RESULTS DATA -----	
ATTACK DELAY TIME:	SERIAL LEVEL
TIME TO OBJECTIVE:	SERIAL LEVEL
CASUALTIES:	SERIAL LEVEL
EQUIPMENT DAMAGE:	SERIAL LEVEL
OTHER FACTORS:	SERIAL LEVEL
OTHER RESULTS:	SERIAL LEVEL
SUPPRESSION:	SERIAL LEVEL
----- CALCULATED DATA -----	
RDS/SQ YD:	TARGET LEVEL
RDS/SQ YD/MIN:	TARGET LEVEL
LBS/SQ YD:	TARGET LEVEL
LBS/SQ YD/MIN:	TARGET LEVEL
LBS/SQ YD (EQ):	TARGET LEVEL
LBS/SQ YD/MIN (EQ):	TARGET LEVEL

## TARGET

SERIAL:	28
TARGET NUMBER:	4
NUMBER PHASES:	2
TIME:	2158
----- TARGET DATA -----	
TARGET:	M SPADURO
TARGET AREA:	28000
TARGET TACTICS:	BOMBARD M SPADURO
----- FIRING DATA -----	
FIRE UNIT:	PHASE LEVEL
TYPE WEAPONS:	PHASE LEVEL
NUMBER TUBES:	PHASE LEVEL
TYPE AMMO:	PHASE LEVEL
ROUNDS PER GUN:	PHASE LEVEL
NUMBER ROUNDS:	PHASE LEVEL
FIRE DURATION:	112
----- RESULTS DATA -----	
ATTACK DELAY TIME:	SERIAL LEVEL
TIME TO OBJECTIVE:	SERIAL LEVEL
CASUALTIES:	SERIAL LEVEL
EQUIPMENT DAMAGE:	SERIAL LEVEL
OTHER FACTORS:	SERIAL LEVEL
OTHER RESULTS:	SERIAL LEVEL
SUPPRESSION:	SERIAL LEVEL
----- CALCULATED DATA -----	
RDS/SQ YD:	0.0257A, 0.000914H
RDS/SQ YD/MIN:	??A, ??H
LBS/SQ YD:	0.843A, 0.185H
LBS/SQ YD/MIN:	??A, ??H
LBS/SQ YD (EQ):	0.843A, 0.0898H
LBS/SQ YD/MIN (EQ):	??A, ??H

## PHASE

```

SERIAL:          28
TARGET NUMBER:   4
PHASE NUMBER:    1
TIME:           2158
----- TARGET DATA -----
TARGET:          TARGET LEVEL

TARGET AREA:     TARGET LEVEL
PHASE TACTICS:   CONCENTRATION

----- FIRING DATA -----
FIRE UNIT:       1 MO BATT
TYPE WEAPONS:    F
NUMBER TUBES:    8F
TYPE AMMO:       ??F
ROUNDS PER GUN:  3.2F
NUMBER ROUNDS:   25.6F
FIRE DURATION:   32

----- RESULTS DATA -----
ATTACK DELAY TIME: SERIAL LEVEL
TIME TO OBJECTIVE: SERIAL LEVEL
CASUALTIES:       SERIAL LEVEL
EQUIPMENT DAMAGE: SERIAL LEVEL
OTHER FACTORS:    SERIAL LEVEL

OTHER RESULTS:   SERIAL LEVEL
SUPPRESSION:     SERIAL LEVEL

----- CALCULATED DATA -----
RDS/SQ YD:       TARGET LEVEL
RDS/SQ YD/MIN:   TARGET LEVEL
LBS/SQ YD:        TARGET LEVEL
LBS/SQ YD/MIN:   TARGET LEVEL
LBS/SQ YD (EQ):  TARGET LEVEL
LBS/SQ YD/MIN (EQ): TARGET LEVEL
    
```

## PHASE

```

SERIAL:          28
TARGET NUMBER:   4
PHASE NUMBER:    2
TIME:           2230
----- TARGET DATA -----
TARGET:          TARGET LEVEL

TARGET AREA:     TARGET LEVEL
PHASE TACTICS:   CONCENTRATION

----- FIRING DATA -----
FIRE UNIT:       1 FO BATT
TYPE WEAPONS:    A
NUMBER TUBES:    8A
TYPE AMMO:       ??A
ROUNDS PER GUN:  90A
NUMBER ROUNDS:   720A
FIRE DURATION:   80

----- RESULTS DATA -----
ATTACK DELAY TIME: SERIAL LEVEL
TIME TO OBJECTIVE: SERIAL LEVEL
CASUALTIES:       SERIAL LEVEL
EQUIPMENT DAMAGE: SERIAL LEVEL
OTHER FACTORS:    SERIAL LEVEL

OTHER RESULTS:   SERIAL LEVEL
SUPPRESSION:     SERIAL LEVEL

----- CALCULATED DATA -----
RDS/SQ YD:       TARGET LEVEL
RDS/SQ YD/MIN:   TARGET LEVEL
LBS/SQ YD:        TARGET LEVEL
LBS/SQ YD/MIN:   TARGET LEVEL
LBS/SQ YD (EQ):  TARGET LEVEL
LBS/SQ YD/MIN (EQ): TARGET LEVEL
    
```

## TARGET

SERIAL:	28
TARGET NUMBER:	5
NUMBER PHASES:	1
TIME:	2300
----- TARGET DATA -----	
TARGET:	PHASE LEVEL
TARGET AREA:	PHASE LEVEL
TARGET TACTICS:	BOMBARD PT317
----- FIRING DATA -----	
FIRE UNIT:	PHASE LEVEL
TYPE WEAPONS:	PHASE LEVEL
NUMBER TUBES:	PHASE LEVEL
TYPE AMMO:	PHASE LEVEL
ROUNDS PER GUN:	PHASE LEVEL
NUMBER ROUNDS:	PHASE LEVEL
FIRE DURATION:	15
----- RESULTS DATA -----	
ATTACK DELAY TIME:	SERIAL LEVEL
TIME TO OBJECTIVE:	SERIAL LEVEL
CASUALTIES:	SERIAL LEVEL
EQUIPMENT DAMAGE:	SERIAL LEVEL
OTHER FACTORS:	SERIAL LEVEL
OTHER RESULTS:	SERIAL LEVEL
SUPPRESSION:	SERIAL LEVEL
----- CALCULATED DATA -----	
RDS/SQ YD:	PHASE LEVEL
RDS/SQ YD/MIN:	PHASE LEVEL
LBS/SQ YD:	PHASE LEVEL
LBS/SQ YD/MIN:	PHASE LEVEL
LBS/SQ YD (EQ):	PHASE LEVEL
LBS/SQ YD/MIN (EQ):	PHASE LEVEL

## PHASE

SERIAL:	28
TARGET NUMBER:	5
PHASE NUMBER:	1
TIME:	2300
----- TARGET DATA -----	
TARGET:	PT317
TARGET AREA:	80000
PHASE TACTICS:	CONCENTRATION
----- FIRING DATA -----	
FIRE UNIT:	1 FD BATT
TYPE WEAPONS:	A
NUMBER TUBES:	16A
TYPE AMMO:	??A
ROUNDS PER GUN:	30A
NUMBER ROUNDS:	480A
FIRE DURATION:	15
----- RESULTS DATA -----	
ATTACK DELAY TIME:	SERIAL LEVEL
TIME TO OBJECTIVE:	SERIAL LEVEL
CASUALTIES:	SERIAL LEVEL
EQUIPMENT DAMAGE:	SERIAL LEVEL
OTHER FACTORS:	SERIAL LEVEL
OTHER RESULTS:	SERIAL LEVEL
SUPPRESSION:	SERIAL LEVEL
----- CALCULATED DATA -----	
RDS/SQ YD:	0.008A
RDS/SQ YD/MIN:	??A
LBS/SQ YD:	0.150A
LBS/SQ YD/MIN:	??A
LBS/SQ YD (EQ):	0.150A
LBS/SQ YD/MIN (EQ):	??A

## TARGET

```

SERIAL: 28
TARGET NUMBER: 8
NUMBER PHASES: 3
TIME: 2300
----- TARGET DATA -----
TARGET: PT362

TARGET AREA: 82000
TARGET TACTICS: BOMBARD PT362

----- FIRING DATA -----
FIRE UNIT: PHASE LEVEL
TYPE WEAPONS: PHASE LEVEL
NUMBER TUBES: PHASE LEVEL
TYPE AMMO: PHASE LEVEL
ROUNDS PER GUN: PHASE LEVEL
NUMBER ROUNDS: PHASE LEVEL
FIRE DURATION: 55

----- RESULTS DATA -----
ATTACK DELAY TIME: SERIAL LEVEL
TIME TO OBJECTIVE: SERIAL LEVEL
CASUALTIES: SERIAL LEVEL
EQUIPMENT DAMAGE: SERIAL LEVEL
OTHER FACTORS: SERIAL LEVEL

OTHER RESULTS: SERIAL LEVEL
SUPPRESSION: SERIAL LEVEL

----- CALCULATED DATA -----
RDS/SQ YD: 0.0322A
RDS/SQ YD/MIN: ??A
LBS/SQ YD: 0.805A
LBS/SQ YD/MIN: ??A
LBS/SQ YD (EQ): 0.805A
LBS/SQ YD/MIN (EQ): ??A
    
```

## PHASE

```

SERIAL: 28
TARGET NUMBER: 8
PHASE NUMBER: 1
TIME: 2300
----- TARGET DATA -----
TARGET: TARGET LEVEL

TARGET AREA: TARGET LEVEL
PHASE TACTICS: CONCENTRATION

----- FIRING DATA -----
FIRE UNIT: 1 FD BATT
TYPE WEAPONS: A
NUMBER TUBES: 8A
TYPE AMMO: ??A
ROUNDS PER GUN: 30A
NUMBER ROUNDS: 240A
FIRE DURATION: 15

----- RESULTS DATA -----
ATTACK DELAY TIME: SERIAL LEVEL
TIME TO OBJECTIVE: SERIAL LEVEL
CASUALTIES: SERIAL LEVEL
EQUIPMENT DAMAGE: SERIAL LEVEL
OTHER FACTORS: SERIAL LEVEL

OTHER RESULTS: SERIAL LEVEL
SUPPRESSION: SERIAL LEVEL

----- CALCULATED DATA -----
RDS/SQ YD: TARGET LEVEL
RDS/SQ YD/MIN: TARGET LEVEL
LBS/SQ YD: TARGET LEVEL
LBS/SQ YD/MIN: TARGET LEVEL
LBS/SQ YD (EQ): TARGET LEVEL
LBS/SQ YD/MIN (EQ): TARGET LEVEL
    
```

## PHASE

SERIAL:	
TARGET NUMBER:	
PHASE NUMBER:	
TIME:	15
----- TARGET DATA -----	
TARGET:	TARGET LEVEL
TARGET AREA:	TARGET LEVEL
PHASE TACTICS:	CONCENTRATION
----- FIRING DATA -----	
FIRE UNIT:	1 FD REGT
TYPE WEAPONS:	A
NUMBER TUBES:	24A
TYPE AMMO:	??A
ROUNDS PER GUN:	90A
NUMBER ROUNDS:	2160A
FIRE DURATION:	30
----- RESULTS DATA -----	
ATTACK DELAY TIME:	SERIAL LEVEL
TIME TO OBJECTIVE:	SERIAL LEVEL
CASUALTIES:	SERIAL LEVEL
EQUIPMENT DAMAGE:	SERIAL LEVEL
OTHER FACTORS:	SERIAL LEVEL
OTHER RESULTS:	SERIAL LEVEL
SUPPRESSION:	SERIAL LEVEL
----- CALCULATED DATA -----	
RDS/SQ YD:	TARGET LEVEL
RDS/SQ YD/MIN:	TARGET LEVEL
LBS/SQ YD:	TARGET LEVEL
LBS/SQ YD/MIN:	TARGET LEVEL
LBS/SQ YD (EQ):	TARGET LEVEL
LBS/SQ YD/MIN (EQ):	TARGET LEVEL

## PHASE

SERIAL:	20
TARGET NUMBER:	6
PHASE NUMBER:	3
TIME:	2345
----- TARGET DATA -----	
TARGET:	TARGET LEVEL
TARGET AREA:	TARGET LEVEL
PHASE TACTICS:	CONCENTRATION
----- FIRING DATA -----	
FIRE UNIT:	1 FD BATT
TYPE WEAPONS:	A
NUMBER TUBES:	8A
TYPE AMMO:	??A
ROUNDS PER GUN:	30A
NUMBER ROUNDS:	240A
FIRE DURATION:	10
----- RESULTS DATA -----	
ATTACK DELAY TIME:	SERIAL LEVEL
TIME TO OBJECTIVE:	SERIAL LEVEL
CASUALTIES:	SERIAL LEVEL
EQUIPMENT DAMAGE:	SERIAL LEVEL
OTHER FACTORS:	SERIAL LEVEL
OTHER RESULTS:	SERIAL LEVEL
SUPPRESSION:	SERIAL LEVEL
----- CALCULATED DATA -----	
RDS/SQ YD:	TARGET LEVEL
RDS/SQ YD/MIN:	TARGET LEVEL
LBS/SQ YD:	TARGET LEVEL
LBS/SQ YD/MIN:	TARGET LEVEL
LBS/SQ YD (EQ):	TARGET LEVEL
LBS/SQ YD/MIN (EQ):	TARGET LEVEL



## SERIAL

SERIAL: 29  
 REF NUMBER: A10  
 ORIG REF: 1 ORS 1/25C10  
 REF TITLE: THE EFFECT OF ARTILLERY FIRE  
 DATA SOURCE: ACTION REPORTS

----- SERIAL DATA -----  
 SIDE 1 COUNTRY: ??  
 SIDE 1 UNITS: ??  
 SIDE 1 POSTURE: ATTACKING  
 SIDE 2 COUNTRY: GERMANY  
 SIDE 2 UNITS: ??  
 SIDE 2 POSTURE: DEFENDING

DATE OF ACTION: 10/20/44  
 COUNTRY: ITALY  
 REGION: FONTANELICE  
 TERRAIN: BARE GRASSY AREA  
 WEATHER: ??  
 TIME: ??

SERIAL TACTICS: ??

NO. BMBRD TARGETS: 2  
 NO. PHASES/TGT: 1/1

----- TARGET DATA -----  
 BOMBARD TARGET: PHASE LEVEL

BOMBARD TGT AREA: PHASE LEVEL  
 BOMBARD TACTICS: TARGET LEVEL

----- FIRING DATA -----  
 FIRE UNIT: PHASE LEVEL  
 TYPE WEAPONS: PHASE LEVEL  
 NUMBER TUBES: PHASE LEVEL  
 TYPE AMMO: PHASE LEVEL  
 ROUNDS PER GUN: PHASE LEVEL  
 NUMBER ROUNDS: PHASE LEVEL  
 FIRE DURATION: TARGET LEVEL AND PHASE LEVEL

----- RESULTS DATA -----  
 ATTACK DELAY TIME: TARGET LEVEL  
 TIME TO OBJECTIVE: TARGET LEVEL  
 CASUALTIES: TARGET LEVEL  
 EQUIPMENT DAMAGE: TARGET LEVEL  
 OTHER FACTORS: TARGET LEVEL

OTHER RESULTS: TARGET LEVEL  
 SUPPRESSION: TARGET LEVEL

----- CALCULATED DATA -----  
 RDS/SQ YD: PHASE LEVEL  
 RDS/SQ YD/MIN: PHASE LEVEL  
 LBS/SQ YD: PHASE LEVEL  
 LBS/SQ YD/MIN: PHASE LEVEL  
 LBS/SQ YD (EQ): PHASE LEVEL  
 LBS/SQ YD/MIN (EQ): PHASE LEVEL

## TARGET

SERIAL:	29
TARGET NUMBER:	1
NUMBER PHASES:	1
TIME:	??
----- TARGET DATA -----	
TARGET:	PHASE LEVEL
TARGET AREA:	PHASE LEVEL
TARGET TACTICS:	DESTROY GERMAN POSITION IN HOUSE
----- FIRING DATA -----	
FIRE UNIT:	PHASE LEVEL
TYPE WEAPONS:	PHASE LEVEL
NUMBER TUBES:	PHASE LEVEL
TYPE AMMO:	PHASE LEVEL
ROUNDS PER GUN:	PHASE LEVEL
NUMBER ROUNDS:	PHASE LEVEL
FIRE DURATION:	??
----- RESULTS DATA -----	
ATTACK DELAY TIME:	??
TIME TO OBJECTIVE:	??
CASUALTIES:	UNKNOWN (GERMAN);UNKNOWN (SIDE1)
EQUIPMENT DAMAGE:	HOUSE COMPLETELY DEMOLISHED (GERMAN);?? (SIDE1)
OTHER FACTORS:	NONE
OTHER RESULTS:	??
SUPPRESSION:	??
----- CALCULATED DATA -----	
RDS/SQ YD:	PHASE LEVEL
RDS/SQ YD/MIN:	PHASE LEVEL
LBS/SQ YD:	PHASE LEVEL
LBS/SQ YD/MIN:	PHASE LEVEL
LBS/SQ YD (EQ):	PHASE LEVEL
LBS/SQ YD/MIN (EQ):	PHASE LEVEL

## PHASE

SERIAL:	29
TARGET NUMBER:	1
PHASE NUMBER:	1
TIME:	??
----- TARGET DATA -----	
TARGET:	GERMAN POSITION IN A SOLITARY, WELL CONSTRUCTED HOUSE
TARGET AREA:	??
PHASE TACTICS:	??
----- FIRING DATA -----	
FIRE UNIT:	??
TYPE WEAPONS:	F
NUMBER TUBES:	1F
TYPE AMMO:	M2119 CAP ON (PD) F
ROUNDS PER GUN:	40F
NUMBER ROUNDS:	40F
FIRE DURATION:	??
----- RESULTS DATA -----	
ATTACK DELAY TIME:	TARGET LEVEL
TIME TO OBJECTIVE:	TARGET LEVEL
CASUALTIES:	TARGET LEVEL
EQUIPMENT DAMAGE:	TARGET LEVEL
OTHER FACTORS:	TARGET LEVEL
OTHER RESULTS:	TARGET LEVEL
SUPPRESSION:	TARGET LEVEL
----- CALCULATED DATA -----	
RDS/SQ YD:	??F
RDS/SQ YD/MIN:	??F
LBS/SQ YD:	??F
LBS/SQ YD/MIN:	??F
LBS/SQ YD (EQ):	??F
LBS/SQ YD/MIN (EQ):	??F

## TARGET

SERIAL: 29  
TARGET NUMBER: 2  
NUMBER PHASES: 1  
TIME: ??

----- TARGET DATA -----  
TARGET: PHASE LEVEL

TARGET AREA: PHASE LEVEL  
TARGET TACTICS: DESTROY GERMAN POSITION IN HOUSE

----- FIRING DATA -----  
FIRE UNIT: PHASE LEVEL  
TYPE WEAPONS: PHASE LEVEL  
NUMBER TUBES: PHASE LEVEL  
TYPE AMMO: PHASE LEVEL  
ROUNDS PER GUN: PHASE LEVEL  
NUMBER ROUNDS: PHASE LEVEL  
FIRE DURATION: ??

----- RESULTS DATA -----  
ATTACK DELAY TIME: ??  
TIME TO OBJECTIVE: ??  
CASUALTIES: NONE (GERMAN);NONE (SIDE1)  
EQUIPMENT DAMAGE: HOUSE DAM,PARTS STILL STANDING (GERMAN);?? (SIDE1)  
OTHER FACTORS: OCCUPANTS OF CELLAR WERE SAFE

OTHER RESULTS: ??  
SUPPRESSION: ??

----- CALCULATED DATA -----  
RDS/SQ YD: PHASE LEVEL  
RDS/SQ YD/MIN: PHASE LEVEL  
LBS/SQ YD: PHASE LEVEL  
LBS/SQ YD/MIN: PHASE LEVEL  
LBS/SQ YD (EQ): PHASE LEVEL  
LBS/SQ YD/MIN (EQ):PHASE LEVEL

## PHASE

SERIAL: 29  
TARGET NUMBER: 2  
PHASE NUMBER: 1  
TIME: ??

----- TARGET DATA -----  
TARGET: GERMAN POSITION IN WELL CONSTRUCTED HOUSE

TARGET AREA: ??  
PHASE TACTICS: ??

----- FIRING DATA -----  
FIRE UNIT: ??  
TYPE WEAPONS: F  
NUMBER TUBES: 1F  
TYPE AMMO: HE119 CAP ON (PD) F  
ROUNDS PER GUN: 41F  
NUMBER ROUNDS: 41F  
FIRE DURATION: ??

----- RESULTS DATA -----  
ATTACK DELAY TIME: TARGET LEVEL  
TIME TO OBJECTIVE: TARGET LEVEL  
CASUALTIES: TARGET LEVEL  
EQUIPMENT DAMAGE: TARGET LEVEL  
OTHER FACTORS: TARGET LEVEL

OTHER RESULTS: TARGET LEVEL  
SUPPRESSION: TARGET LEVEL

----- CALCULATED DATA -----  
RDS/SQ YD: ??F  
RDS/SQ YD/MIN: ??F  
LBS/SQ YD: ??F  
LBS/SQ YD/MIN: ??F  
LBS/SQ YD (EQ): ??F  
LBS/SQ YD/MIN (EQ):??F



SERIAL

SERIAL: 30  
 REF NUMBER: A33  
 ORIG REF: DOR 45/31  
 REF TITLE: LANDINGS ON PACIFIC ATOLLS  
 DATA SOURCE: ACTION REPORTS

----- SERIAL DATA -----

SIDE 1 COUNTRY: JS  
 SIDE 1 UNITS: 6500 MEN  
 SIDE 1 POSTURE: ATTACKING  
 SIDE 2 COUNTRY: JAPAN  
 SIDE 2 UNITS: 825 MEN  
 SIDE 2 POSTURE: DEFENDING

DATE OF ACTION: 11/20/43  
 COUNTRY: MAKIN ATOLL, GILBERTS  
 REGION: BUTARITAR ISLAND  
 TERRAIN: BEACHES ON SMALL ISLAND  
 WEATHER: ??  
 TIME: 0830/1030

SERIAL TACTICS: TO LAND ON TWO BEACHES AND CAPTURE ISLAND

NO. BMBRD TARGETS: 2  
 NO. PHASES/TGT: 1/1

----- TARGET DATA -----

BOMBARD TARGET: PHASE LEVEL

BOMBARD TGT AREA: PHASE LEVEL  
 BOMBARD TACTICS: TARGET LEVEL

----- FIRING DATA -----

FIRE UNIT: PHASE LEVEL  
 TYPE WEAPONS: PHASE LEVEL  
 NUMBER TUBES: PHASE LEVEL  
 TYPE AMMO: PHASE LEVEL  
 ROUNDS PER GUN: PHASE LEVEL  
 NUMBER ROUNDS: PHASE LEVEL  
 FIRE DURATION: TARGET LEVEL AND PHASE LEVEL

----- RESULTS DATA -----

ATTACK DELAY TIME: ??  
 TIME TO OBJECTIVE: ISLAND CAPTURED IN 2 DAYS  
 CASUALTIES: 520 KIA, 105 POW (JAPANESE); 88 KIA, 187 WIA (US)  
 EQUIPMENT DAMAGE: ??;??  
 OTHER FACTORS: AMPHIBIOUS LANDING; JAPANESE WERE ON SMALL ISLAND WITH NO AVENUE OF ESCAPE  
 OTHER RESULTS: HEAVY OPPOSITION ON YELLOW BEACH, LIGHT OPPOSITION ON RED BEACH  
 SUPPRESSION: UNKNOWN

----- CALCULATED DATA -----

RDS/SQ YD: PHASE LEVEL  
 RDS/SQ YD/MIN: PHASE LEVEL  
 LBS/SQ YD: PHASE LEVEL  
 LBS/SQ YD/MIN: PHASE LEVEL  
 LBS/SQ YD (EQ): PHASE LEVEL  
 LBS/SQ YD/MIN (EQ): PHASE LEVEL

## TARGET

```

SERIAL:          30
TARGET NUMBER:   1
NUMBER PHASES:   1
TIME:           1030
----- TARGET DATA -----
TARGET:         PHASE LEVEL

TARGET AREA:     PHASE LEVEL
TARGET TACTICS:  NAVAL AND AERIAL BOMBARDMENT IN PREPARATION FOR AMPHIBIOUS LANDING

----- FIRING DATA -----
FIRE UNIT:      PHASE LEVEL
TYPE WEAPONS:   PHASE LEVEL
NUMBER TUBES:   PHASE LEVEL
TYPE AMMO:      PHASE LEVEL
ROUNDS PER GUN: PHASE LEVEL
NUMBER ROUNDS:  PHASE LEVEL
FIRE DURATION:  275

----- RESULTS DATA -----
ATTACK DELAY TIME: SERIAL LEVEL
TIME TO OBJECTIVE: SERIAL LEVEL
CASUALTIES:       SERIAL LEVEL
EQUIPMENT DAMAGE: SERIAL LEVEL
OTHER FACTORS:    SERIAL LEVEL

OTHER RESULTS:   SERIAL LEVEL
SUPPRESSION:     SERIAL LEVEL

----- CALCULATED DATA -----
RDS/SQ YD:       PHASE LEVEL
RDS/SQ YD/MIN:   PHASE LEVEL
LBS/SQ YD:       PHASE LEVEL
LBS/SQ YD/MIN:   PHASE LEVEL
LBS/SQ YD (EQ): PHASE LEVEL
LBS/SQ YD/MIN (EQ): PHASE LEVEL
    
```

## PHASE

```

SERIAL:          30
TARGET NUMBER:   1
PHASE NUMBER:    1
TIME:           1030
----- TARGET DATA -----
TARGET:         YELLOW BEACH

TARGET AREA:     994000
PHASE TACTICS:   ??

----- FIRING DATA -----
FIRE UNIT:      NAVAL FIRE SUPPORT/AERIAL FIRE SUPPORT
TYPE WEAPONS:   M,N,P/??
NUMBER TUBES:   ??M,??N,??P/??
TYPE AMMO:      ??M,??N,??P/??
ROUNDS PER GUN: ??M,??N,??P/??
NUMBER ROUNDS:  370M,480N,4740P/??
FIRE DURATION:  275

----- RESULTS DATA -----
ATTACK DELAY TIME: SERIAL LEVEL
TIME TO OBJECTIVE: SERIAL LEVEL
CASUALTIES:       SERIAL LEVEL
EQUIPMENT DAMAGE: SERIAL LEVEL
OTHER FACTORS:    SERIAL LEVEL

OTHER RESULTS:   SERIAL LEVEL
SUPPRESSION:     SERIAL LEVEL

----- CALCULATED DATA -----
RDS/SQ YD:       .000372M,.000480N,.00477P/??
RDS/SQ YD/MIN:   ??M,??N,??P/??
LBS/SQ YD:       .474M,.125N,.245P/??
LBS/SQ YD/MIN:   ??M,??N,??P/??
LBS/SQ YD (EQ): .0614M,.0502N,.150P/??
LBS/SQ YD/MIN (EQ): ??M,??N,??P/??
    
```

## TARGET

```

SERIAL: 30
TARGET NUMBER: 2
NUMBER PHASES: 1
TIME: 0830
----- TARGET DATA -----
TARGET: PHASE LEVEL

TARGET AREA: PHASE LEVEL
TARGET TACTICS: NAVAL AND AERIAL BOMBARDMENT IN PREPARATION FOR AMPHIBIOUS LANDING

----- FIRING DATA -----
FIRE UNIT: PHASE LEVEL
TYPE WEAPONS: PHASE LEVEL
NUMBER TUBES: PHASE LEVEL
TYPE AMMO: PHASE LEVEL
ROUNDS PER GUN: PHASE LEVEL
NUMBER ROUNDS: PHASE LEVEL
FIRE DURATION: 155

----- RESULTS DATA -----
ATTACK DELAY TIME: SERIAL LEVEL
TIME TO OBJECTIVE: SERIAL LEVEL
CASUALTIES: SERIAL LEVEL
EQUIPMENT DAMAGE: SERIAL LEVEL
OTHER FACTORS: SERIAL LEVEL

OTHER RESULTS: SERIAL LEVEL
SUPPRESSION: SERIAL LEVEL

----- CALCULATED DATA -----
RDS/SQ YD: PHASE LEVEL
RDS/SQ YD/MIN: PHASE LEVEL
LBS/SQ YD: PHASE LEVEL
LBS/SQ YD/MIN: PHASE LEVEL
LBS/SQ YD (EQ): PHASE LEVEL
LBS/SQ YD/MIN (EQ): PHASE LEVEL
    
```

## PHASE

```

SERIAL: 30
TARGET NUMBER: 2
PHASE NUMBER: 1
TIME: 0830
----- TARGET DATA -----
TARGET: RED BEACH

TARGET AREA: 425000
PHASE TACTICS: ??

----- FIRING DATA -----
FIRE UNIT: NAVAL FIRE SUPPORT/NAVAL AERIAL SUPPORT
TYPE WEAPONS: M,N,P/??
NUMBER TUBES: ??M,??N,??P/??
TYPE AMMO: ??M,??N,??P/??
ROUNDS PER GUN: ??M,??N,??P/??
NUMBER ROUNDS: 428M,335N,1329P/??
FIRE DURATION: 155

----- RESULTS DATA -----
ATTACK DELAY TIME: SERIAL LEVEL
TIME TO OBJECTIVE: SERIAL LEVEL
CASUALTIES: SERIAL LEVEL
EQUIPMENT DAMAGE: SERIAL LEVEL
OTHER FACTORS: SERIAL LEVEL

OTHER RESULTS: SERIAL LEVEL
SUPPRESSION: SERIAL LEVEL

----- CALCULATED DATA -----
RDS/SQ YD: .00101M,.000787N,.00313P/??
RDS/SQ YD/MIN: ??M,??N,??P/??
LBS/SQ YD: 1.284M,.204N,.180P/??
LBS/SQ YD/MIN: ??M,??N,??P/??
LBS/SQ YD (EQ): .166M,.0809N,.103P/??
LBS/SQ YD/MIN (EQ): ??M,??N,??P/??
    
```



## SERIAL

SERIAL: 31  
 REF NUMBER: A31,A32,A33,A34  
 ORIG REF: DOR 44/18, 44/117, 44/120, 45/31, 45/37, CMH PUB 5-6  
 REF TITLE: 6 SEPARATE TITLES  
 DATA SOURCE: ACTION REPORTS

### ----- SERIAL DATA -----

SIDE 1 COUNTRY: US  
 SIDE 1 UNITS: 18000 MEN  
 SIDE 1 POSTURE: ATTACKING  
 SIDE 2 COUNTRY: JAPAN  
 SIDE 2 UNITS: 3648 MEN  
 SIDE 2 POSTURE: DEFENDING

DATE OF ACTION: 11/20/43  
 COUNTRY: TARAWA ATOLL, GILBERTS  
 REGION: BETIO ISLAND  
 TERRAIN: FAIRLY FLAT ISLAND  
 WEATHER: ??  
 TIME: 0917

SERIAL TACTICS: TO MAKE AN AMPHIBIOUS ASSAULT ON THE ISLAND

NO. BMBRD TARGETS: 1  
 NO. PHASES/TGT: 2

### ----- TARGET DATA -----

BOMBARD TARGET: TARGET LEVEL  
 BOMBARD TGT AREA: TARGET LEVEL  
 BOMBARD TACTICS: TARGET LEVEL

### ----- FIRING DATA -----

FIRE UNIT: PHASE LEVEL  
 TYPE WEAPONS: PHASE LEVEL  
 NUMBER TUBES: PHASE LEVEL  
 TYPE AMMO: PHASE LEVEL  
 ROUNDS PER GUN: PHASE LEVEL  
 NUMBER ROUNDS: PHASE LEVEL  
 FIRE DURATION: TARGET LEVEL AND PHASE LEVEL

### ----- RESULTS DATA -----

ATTACK DELAY TIME: 22 MINUTES  
 TIME TO OBJECTIVE: 9-75 HOURS  
 CASUALTIES: 3638 KIA, 10 POW (JAPANESE);1056 KIA, 2557 WIA (US)  
 EQUIPMENT DAMAGE: DAM FIRE CONTR & COMMUNICATIONS (JAPANESE);?? (US)  
 OTHER FACTORS: AMPHIBIOUS LANDING;DEFENDERS HAD NO AVENUE OF ESCAPE;JAPANESE BLOCKH  
 OUSES HELD AGAINST BOMBS & SHELL  
 OTHER RESULTS: HEAVY CASUALTIES DUE TO LACK OF SUPPORT FIRE DURING LAST STAGE OF ASSAULT  
 SUPPRESSION: ASSAULT TROOPS MET BY VERY EFFECTIVE RESISTANCE FROM MACHINE GUNS

### ----- CALCULATED DATA -----

RDS/SQ YD: TARGET LEVEL  
 RDS/SQ YD/MIN: TARGET LEVEL  
 LBS/SQ YD: TARGET LEVEL  
 LBS/SQ YD/MIN: TARGET LEVEL  
 LBS/SQ YD (EQ): TARGET LEVEL  
 LBS/SQ YD/MIN (EQ):TARGET LEVEL

## TARGET

SERIAL:	31
TARGET NUMBER:	1
NUMBER PHASES:	2
TIME:	0917
----- TARGET DATA -----	
TARGET:	ASSAULT BEACH
TARGET AREA:	1460000
TARGET TACTICS:	NAVAL AND AERIAL BOMBARDMENT IN SUPPORT OF AMPHIBIOUS LANDING
----- FIRING DATA -----	
FIRE UNIT:	PHASE LEVEL
TYPE WEAPONS:	PHASE LEVEL
NUMBER TUBES:	PHASE LEVEL
TYPE AMMO:	PHASE LEVEL
ROUNDS PER GUN:	PHASE LEVEL
NUMBER ROUNDS:	PHASE LEVEL
FIRE DURATION:	??
----- RESULTS DATA -----	
ATTACK DELAY TIME:	SERIAL LEVEL
TIME TO OBJECTIVE:	SERIAL LEVEL
CASUALTIES:	SERIAL LEVEL
EQUIPMENT DAMAGE:	SERIAL LEVEL
OTHER FACTORS:	SERIAL LEVEL
OTHER RESULTS:	SERIAL LEVEL
SUPPRESSION:	SERIAL LEVEL
----- CALCULATED DATA -----	
RDS/SQ YD:	.000507Q, .000404M, .000555M, .00160R, .000199S, .014P/??(AA&BB)
RDS/SQ YD/MIN:	??Q, ??M, ??N, ??R, ??S, ??P/??(AA&BB)
LBS/SQ YD:	.963Q, .515M, .144N, .17R, .0260S, .757P/.255(AA&BB)
LBS/SQ YD/MIN:	??Q, ??M, ??N, ??R, ??S, ??P/??(AA&BB)
LBS/SQ YD (EQ):	.0963Q, .067M, .0575N, .0849R, .0123S, .491P/.255(AA&BB)
LBS/SQ YD/MIN (EQ):	??Q, ??M, ??N, ??R, ??S, ??P/??(AA&BB)

## PHASE

SERIAL:	31
TARGET NUMBER:	1
PHASE NUMBER:	1
TIME:	BEFORE H HOUR
----- TARGET DATA -----	
TARGET:	TARGET LEVEL
TARGET AREA:	TARGET LEVEL
PHASE TACTICS:	??
----- FIRING DATA -----	
FIRE UNIT:	NAVAL FIRE SUPPORT/AERIAL FIRE SUPPORT
TYPE WEAPONS:	Q, M, N, R, S, P/AA&BB
NUMBER TUBES:	??Q, ??M, ??N, ??R, ??S, ??P/??AA&BB
TYPE AMMO:	HC Q, HC M, HC N, HC R, AP S, HC&AC P/?? AA&BB
ROUNDS PER GUN:	??Q, ??M, ??N, ??R, ??S, ??P/??AA&BB
NUMBER ROUNDS:	444Q, 354M, 486N, 1416R, 174S, 12288P/??
FIRE DURATION:	233
----- RESULTS DATA -----	
ATTACK DELAY TIME:	SERIAL LEVEL
TIME TO OBJECTIVE:	SERIAL LEVEL
CASUALTIES:	SERIAL LEVEL
EQUIPMENT DAMAGE:	SERIAL LEVEL
OTHER FACTORS:	SERIAL LEVEL
OTHER RESULTS:	SERIAL LEVEL
SUPPRESSION:	SERIAL LEVEL
----- CALCULATED DATA -----	
RDS/SQ YD:	TARGET LEVEL
RDS/SQ YD/MIN:	TARGET LEVEL
LBS/SQ YD:	TARGET LEVEL
LBS/SQ YD/MIN:	TARGET LEVEL
LBS/SQ YD (EQ):	TARGET LEVEL
LBS/SQ YD/MIN (EQ):	TARGET LEVEL

# PHASE

SERIAL: 31  
TARGET NUMBER: 1  
PHASE NUMBER: 2  
TIME: AFTER H HOUR  
----- TARGET DATA -----  
TARGET: TARGET LEVEL  
  
TARGET AREA: TARGET LEVEL  
PHASE TACTICS: ??  
  
----- FIRING DATA -----  
FIRE UNIT: NAVAL FIRE SUPPORT  
TYPE WEAPONS: Q,M,N,R,S,P  
NUMBER TUBES: ??Q,??M,??N,??R,??S,??P  
TYPE AMMO: HC Q,HC M,HC N,HC R,AP S,HC&AAC P  
ROUNDS PER GUN: ??Q,??M,??N,??R,??S,??P  
NUMBER ROUNDS: 296Q,236M,324N,944R,116S,8192P  
FIRE DURATION: ??  
  
----- RESULTS DATA -----  
ATTACK DELAY TIME: SERIAL LEVEL  
TIME TO OBJECTIVE: SERIAL LEVEL  
CASUALTIES: SERIAL LEVEL  
EQUIPMENT DAMAGE: SERIAL LEVEL  
OTHER FACTORS: SERIAL LEVEL  
  
OTHER RESULTS: SERIAL LEVEL  
SUPPRESSION: SERIAL LEVEL  
  
----- CALCULATED DATA -----  
RDS/SQ YD: TARGET LEVEL  
RDS/SQ YD/MIN: TARGET LEVEL  
LBS/SQ YD: TARGET LEVEL  
LBS/SQ YD/MIN: TARGET LEVEL  
LBS/SQ YD (EQ): TARGET LEVEL  
LBS/SQ YD/MIN (EQ): TARGET LEVEL



## SERIAL

SERIAL: 32  
 REF NUMBER: A31.A32.A33  
 ORIG REF: DOR 44/117.44/120.45/31  
 REF TITLE: INVASION OF THE MARSHALL ISLANDS (AND 2 OTHER TITLES)  
 DATA SOURCE: ACTION REPORTS

----- SERIAL DATA -----

SIDE 1 COUNTRY: US  
 SIDE 1 UNITS: 3400 MEN  
 SIDE 1 POSTURE: ATTACKING  
 SIDE 2 COUNTRY: JAPAN  
 SIDE 2 UNITS: 1276 MEN  
 SIDE 2 POSTURE: DEFENDING

DATE OF ACTION: 02/18/44  
 COUNTRY: ENIWETOK ATOLL, MARSHALL ISLANDS  
 REGION: ENGEBI ISLAND  
 TERRAIN: PACIFIC ISLAND  
 WEATHER: ??  
 TIME: 0842

SERIAL TACTICS: NAVAL, AERIAL, AND ARTY BOMBARDMENT IN SUPPORT OF AMPHIBIOUS LANDINGS

NO. BMBRD TARGETS: 1  
 NO. PHASES/TGT: 1

----- TARGET DATA -----

BOMBARD TARGET: PHASE LEVEL

BOMBARD TGT AREA: PHASE LEVEL  
 BOMBARD TACTICS: TARGET LEVEL

----- FIRING DATA -----

FIRE UNIT: PHASE LEVEL  
 TYPE WEAPONS: PHASE LEVEL  
 NUMBER TUBES: PHASE LEVEL  
 TYPE AMMO: PHASE LEVEL  
 ROUNDS PER GUN: PHASE LEVEL  
 NUMBER ROUNDS: PHASE LEVEL  
 FIRE DURATION: TARGET LEVEL AND PHASE LEVEL

----- RESULTS DATA -----

ATTACK DELAY TIME: ??  
 TIME TO OBJECTIVE: 7 HOURS  
 CASUALTIES: 1276 (41 POW) (JAPANESE); 80 KIA, 180 WIA (US)  
 EQUIPMENT DAMAGE: MANY PERMANENT DEFENSES DEST (JAPANESE); ?? (US)  
 OTHER FACTORS: JAPANESE ON SMALL ISLAND, SURROUNDED BY HOSTILE FORCES, WITH NO AVENUE OF ESCAPE  
 OTHER RESULTS: OPPOSITION LIGHT ON BEACH BUT STUBBORN RESISTANCE MET 100 YDS INLAND  
 SUPPRESSION: NO ESTIMATES GIVEN BUT CASUALTIES CONSIDERED LIGHT FOR NUMBER OF DEFENDERS

----- CALCULATED DATA -----

RDS/SQ YD: PHASE LEVEL  
 RDS/SQ YD/MIN: PHASE LEVEL  
 LBS/SQ YD: PHASE LEVEL  
 LBS/SQ YD/MIN: PHASE LEVEL  
 LBS/SQ YD (EQ): PHASE LEVEL  
 LBS/SQ YD/MIN (EQ): PHASE LEVEL

## TARGET

SERIAL:	32
TARGET NUMBER:	1
NUMBER PHASES:	1
TIME:	0842
----- TARGET DATA -----	
TARGET:	PHASE LEVEL
TARGET AREA:	PHASE LEVEL
TARGET TACTICS:	NAVAL, AERIAL, AND LAND BOMBARDMENT IN SUPPORT OF AMPHIBIOUS ASSAULT A NO SUBSEQUENT OPERATIONS
----- FIRING DATA -----	
FIRE UNIT:	PHASE LEVEL
TYPE WEAPONS:	PHASE LEVEL
NUMBER TUBES:	PHASE LEVEL
TYPE AMMO:	PHASE LEVEL
ROUNDS PER GUN:	PHASE LEVEL
NUMBER ROUNDS:	PHASE LEVEL
FIRE DURATION:	1545
----- RESULTS DATA -----	
ATTACK DELAY TIME:	SERIAL LEVEL
TIME TO OBJECTIVE:	SERIAL LEVEL
CASUALTIES:	SERIAL LEVEL
EQUIPMENT DAMAGE:	SERIAL LEVEL
OTHER FACTORS:	SERIAL LEVEL
OTHER RESULTS:	SERIAL LEVEL
SUPPRESSION:	SERIAL LEVEL
----- CALCULATED DATA -----	
RDS/SQ YD:	PHASE LEVEL
RDS/SQ YD/MIN:	PHASE LEVEL
LBS/SQ YD:	PHASE LEVEL
LBS/SQ YD/MIN:	PHASE LEVEL
LBS/SQ YD (EQ):	PHASE LEVEL
LBS/SQ YD/MIN (EQ):	PHASE LEVEL

## PHASE

SERIAL:	32
TARGET NUMBER:	1
PHASE NUMBER:	1
TIME:	0842
----- TARGET DATA -----	
TARGET:	ENTIRE ISLAND, TO INCLUDE ASSAULT BEACH
TARGET AREA:	1420000
PHASE TACTICS:	??
----- FIRING DATA -----	
FIRE UNIT:	NAVAL/AERIAL/ARTY
TYPE WEAPONS:	Q, M, N, P/??/??
NUMBER TUBES:	??Q, ??N, ??N, ??P/??/??
TYPE AMMO:	??Q, ??N, ??N, ??P/??/??
ROUNDS PER GUN:	??Q, ??N, ??N, ??P/??/??
NUMBER ROUNDS:	500Q, 850N, 870N, 4640P/??/??
FIRE DURATION:	1545
----- RESULTS DATA -----	
ATTACK DELAY TIME:	SERIAL LEVEL
TIME TO OBJECTIVE:	SERIAL LEVEL
CASUALTIES:	SERIAL LEVEL
EQUIPMENT DAMAGE:	SERIAL LEVEL
OTHER FACTORS:	SERIAL LEVEL
OTHER RESULTS:	SERIAL LEVEL
SUPPRESSION:	SERIAL LEVEL
----- CALCULATED DATA -----	
RDS/SQ YD:	??Q, ??N, ??N, ??P/??/??
RDS/SQ YD/MIN:	??Q, ??N, ??N, ??P/??/??
LBS/SQ YD:	??Q, ??N, ??N, ??P/??/??
LBS/SQ YD/MIN:	??Q, ??N, ??N, ??P/??/??
LBS/SQ YD (EQ):	??Q, ??N, ??N, ??P/??/??
LBS/SQ YD/MIN (EQ):	??Q, ??N, ??N, ??P/??/??

## SERIAL

SERIAL: 33  
 REF NUMBER: A31,A32,A33,A34  
 ORIG REF: OOR 44/117,44/120,45/31,45/37  
 REF TITLE: INVASION OF THE MARSHALL ISLANDS (AND 3 OTHER TITLES)  
 DATA SOURCE: ACTION REPORTS

----- SERIAL DATA -----

SIDE 1 COUNTRY: US  
 SIDE 1 UNITS: 3400 MEN  
 SIDE 1 POSTURE: ATTACKING  
 SIDE 2 COUNTRY: JAPAN  
 SIDE 2 UNITS: 808 MEN  
 SIDE 2 POSTURE: DEFENDING

DATE OF ACTION: 02/19/44  
 COUNTRY: ENIWETOK ATOLL, MARSHALL ISLANDS  
 REGION: ENIWETOK ISLAND  
 TERRAIN: PACIFIC ISLAND  
 WEATHER: ??  
 TIME: 0916

SERIAL TACTICS: NAVAL, AERIAL, AND ARTY BOMBARDMENT IN SUPPORT OF AMPHIBIOUS LANDING

NO BMBRD TARGETS: 1  
 NO. PHASES/TGT: 1

----- TARGET DATA -----

BOMBARD TARGET: PHASE LEVEL

BOMBARD TOT AREA: PHASE LEVEL  
 BOMBARD TACTICS: TARGET LEVEL

----- FIRING DATA -----

FIRE UNIT: PHASE LEVEL  
 TYPE WEAPONS: PHASE LEVEL  
 NUMBER TUBES: PHASE LEVEL  
 TYPE AMMO: PHASE LEVEL  
 ROUNDS PER GUN: PHASE LEVEL  
 NUMBER ROUNDS: PHASE LEVEL  
 FIRE DURATION: TARGET LEVEL AND PHASE LEVEL

----- RESULTS DATA -----

ATTACK DELAY TIME: ??  
 TIME TO OBJECTIVE: 1.5 DAYS  
 CASUALTIES: 808 (2 POW) (JAPANESE); 105 KIA, 275 WIA (US)  
 EQUIPMENT DAMAGE: ??, ??  
 OTHER FACTORS: JAPANESE ON SMALL ISLAND, SURROUNDED BY HOSTILE FORCES, WITH NO AVENUE OF ESCAPE  
 OTHER RESULTS: STUBBORN RESISTANCE  
 SUPPRESSION: NO ESTIMATES GIVEN BUT CASUALTIES CONSIDERED LIGHT FOR NUMBER OF DEFENDERS

----- CALCULATED DATA -----

ROS/SQ YD: PHASE LEVEL  
 ROS/SQ YD/MIN: PHASE LEVEL  
 LBS/SQ YD: PHASE LEVEL  
 LBS/SQ YD/MIN: PHASE LEVEL  
 LBS/SQ YD (EQ): PHASE LEVEL  
 LBS/SQ YD/MIN (EQ): PHASE LEVEL

## TARGET

SERIAL:	33
TARGET NUMBER:	1
NUMBER PHASES:	1
TIME:	0916
----- TARGET DATA -----	
TARGET:	PHASE LEVEL
TARGET AREA:	PHASE LEVEL
TARGET TACTICS:	NAVAL, AERIAL, AND ARTY BOMBARDMENT IN SUPPORT OF AMPHIBIOUS ASSAULT AND SUBSEQUENT OPERATIONS
----- FIRING DATA -----	
FIRE UNIT:	PHASE LEVEL
TYPE WEAPONS:	PHASE LEVEL
NUMBER TUBES:	PHASE LEVEL
TYPE AMMO:	PHASE LEVEL
ROUNDS PER GUN:	PHASE LEVEL
NUMBER ROUNDS:	PHASE LEVEL
FIRE DURATION:	??
----- RESULTS DATA -----	
ATTACK DELAY TIME:	SERIAL LEVEL
TIME TO OBJECTIVE:	SERIAL LEVEL
CASUALTIES:	SERIAL LEVEL
EQUIPMENT DAMAGE:	SERIAL LEVEL
OTHER FACTORS:	SERIAL LEVEL
OTHER RESULTS:	SERIAL LEVEL
SUPPRESSION:	SERIAL LEVEL
----- CALCULATED DATA -----	
RDS/SQ YD:	PHASE LEVEL
RDS/SQ YD/MIN:	PHASE LEVEL
LBS/SQ YD:	PHASE LEVEL
LBS/SQ YD/MIN:	PHASE LEVEL
LBS/SQ YD (EQ):	PHASE LEVEL
LBS/SQ YD/MIN (EQ):	PHASE LEVEL

## PHASE

SERIAL:	33
TARGET NUMBER:	1
PHASE NUMBER:	1
TIME:	0916
----- TARGET DATA -----	
TARGET:	ENTIRE ISLAND TO INCLUDE ASSAULT BEACH
TARGET AREA:	1450000
PHASE TACTICS:	??
----- FIRING DATA -----	
FIRE UNIT:	NAVAL/AERIAL/ARTY
TYPE WEAPONS:	M, P, ??/??
NUMBER TUBES:	??N, ??P/??/??
TYPE AMMO:	??N, ??P/??/??
ROUNDS PER GUN:	??N, ??P/??/??
NUMBER ROUNDS:	1090N, 4350P/??/??
FIRE DURATION:	??
----- RESULTS DATA -----	
ATTACK DELAY TIME:	SERIAL LEVEL
TIME TO OBJECTIVE:	SERIAL LEVEL
CASUALTIES:	SERIAL LEVEL
EQUIPMENT DAMAGE:	SERIAL LEVEL
OTHER FACTORS:	SERIAL LEVEL
OTHER RESULTS:	SERIAL LEVEL
SUPPRESSION:	SERIAL LEVEL
----- CALCULATED DATA -----	
RDS/SQ YD:	.000752N, .003P/??/??
RDS/SQ YD/MIN:	??N, ??P/??/??
LBS/SQ YD:	.196N, .153P/.0906/.215
LBS/SQ YD/MIN:	??N, ??P/??/??
LBS/SQ YD (EQ):	.0706N, .0993P/.0906/.215
LBS/SQ YD/MIN (EQ):	??N, ??P/??/??

## SERIAL

SERIAL: 34  
 REF NUMBER: A31, A32, A33, A34  
 ORIG REF: OOR 44/117, 44/120, 45/31, 45/37  
 REF TITLE: INVASION OF THE MARSHALL ISLANDS (AND 3 OTHER TITLES)  
 DATA SOURCE: ACTION REPORTS

### ----- SERIAL DATA -----

SIDE 1 COUNTRY: US  
 SIDE 1 UNITS: 4500 MEN  
 SIDE 1 POSTURE: ATTACKING  
 SIDE 2 COUNTRY: JAPAN  
 SIDE 2 UNITS: 1347 MEN  
 SIDE 2 POSTURE: DEFENDING

DATE OF ACTION: 02/22/44  
 COUNTRY: ENIWETOK ATOLL, MARSHALL ISLANDS  
 REGION: PARRY ISLAND  
 TERRAIN: PACIFIC ISLAND  
 WEATHER: ??  
 TIME: 0900

SERIAL TACTICS: NAVAL, AERIAL, AND ARTY BOMBARDMENT IN SUPPORT OF AMPHIBIOUS LANDING

NO. BMBRD TARGETS: 1  
 NO. PHASES/TGT: 1

### ----- TARGET DATA -----

BOMBARD TARGET: PHASE LEVEL  
 BOMBARD TGT AREA: PHASE LEVEL  
 BOMBARD TACTICS: TARGET LEVEL

### ----- FIRING DATA -----

FIRE UNIT: PHASE LEVEL  
 TYPE WEAPONS: PHASE LEVEL  
 NUMBER TUBES: PHASE LEVEL  
 TYPE AMMO: PHASE LEVEL  
 ROUNDS PER GUN: PHASE LEVEL  
 NUMBER ROUNDS: PHASE LEVEL  
 FIRE DURATION: TARGET LEVEL AND PHASE LEVEL

### ----- RESULTS DATA -----

ATTACK DELAY TIME: ??  
 TIME TO OBJECTIVE: 10.5 HOURS  
 CASUALTIES: 1347 (17 POW) (JAPANESE); 360 (US)  
 EQUIPMENT DAMAGE: ??:??  
 OTHER FACTORS: JAPANESE ON SMALL ISLAND, SURROUNDED BY HOSTILE FORCES, WITH NO AVENUE OF ESCAPE  
 OTHER RESULTS: STUBBORN RESISTANCE FROM 150 YDS INLAND  
 SUPPRESSION: NO ESTIMATES GIVEN BUT CASUALTIES CONSIDERED LIGHT FOR NUMBER OF DEFENDERS

### ----- CALCULATED DATA -----

RDS/SQ YD: PHASE LEVEL  
 RDS/SQ YD/MIN: PHASE LEVEL  
 LBS/SQ YD: PHASE LEVEL  
 LBS/SQ YD/MIN: PHASE LEVEL  
 LBS/SQ YD (EQ): PHASE LEVEL  
 LBS/SQ YD/MIN (EQ): PHASE LEVEL

## TARGET

```

SERIAL: 34
TARGET NUMBER: 1
NUMBER PHASES: 1
TIME: 0900
----- TARGET DATA -----
TARGET: PHASE LEVEL

TARGET AREA: PHASE LEVEL
TARGET TACTICS: NAVAL, AERIAL, AND ARTY BOMBARDMENT IN SUPPORT OF AMPHIBIOUS ASSAULT AND
SUBSEQUENT OPERATIONS
----- FIRING DATA -----
FIRE UNIT: PHASE LEVEL
TYPE WEAPONS: PHASE LEVEL
NUMBER TUBES: PHASE LEVEL
TYPE AMMO: PHASE LEVEL
ROUNDS PER GUN: PHASE LEVEL
NUMBER ROUNDS: PHASE LEVEL
FIRE DURATION: ??
----- RESULTS DATA -----
ATTACK DELAY TIME: SERIAL LEVEL
TIME TO OBJECTIVE: SERIAL LEVEL
CASUALTIES: SERIAL LEVEL
EQUIPMENT DAMAGE: SERIAL LEVEL
OTHER FACTORS: SERIAL LEVEL

OTHER RESULTS: SERIAL LEVEL
SUPPRESSION: SERIAL LEVEL

----- CALCULATED DATA -----
RDS/SQ YD: PHASE LEVEL
RDS/SQ YD/MIN: PHASE LEVEL
LBS/SQ YD: PHASE LEVEL
LBS/SQ YD/MIN: PHASE LEVEL
LBS/SQ YD (EQ): PHASE LEVEL
LBS/SQ YD/MIN (EQ): PHASE LEVEL
    
```

## PHASE

```

SERIAL: 34
TARGET NUMBER: 1
PHASE NUMBER: 1
TIME: 0900
----- TARGET DATA -----
TARGET: ENTIRE ISLAND TO INCLUDE ASSAULT BEACH

TARGET AREA: 880000
PHASE TACTICS: ??
----- FIRING DATA -----
FIRE UNIT: NAVAL/AERIAL/ARTY
TYPE WEAPONS: O.M.N.P/??/??
NUMBER TUBES: ??, ??M, ??N, ??P/??/??
TYPE AMMO: ??Q, ??M, ??N, ??P/??/??
ROUNDS PER GUN: ??Q, ??M, ??N, ??P/??/??
NUMBER ROUNDS: 140Q, 750M, 800N, 8050P/??/??
FIRE DURATION: ??
----- RESULTS DATA -----
ATTACK DELAY TIME: SERIAL LEVEL
TIME TO OBJECTIVE: SERIAL LEVEL
CASUALTIES: SERIAL LEVEL
EQUIPMENT DAMAGE: SERIAL LEVEL
OTHER FACTORS: SERIAL LEVEL

OTHER RESULTS: SERIAL LEVEL
SUPPRESSION: SERIAL LEVEL

----- CALCULATED DATA -----
RDS/SQ YD: .000159Q, .000892M, .00102N, .0113P/??/??
RDS/SQ YD/MIN: ??Q, ??M, ??N, ??P/??/??
LBS/SQ YD: .302Q, 1.086M, .256N, .577P/.225/.418
LBS/SQ YD/MIN: ??Q, ??M, ??N, ??P/??/??
LBS/SQ YD (EQ): .0285Q, .141M, .105N, .375P/.225/.418
LBS/SQ YD/MIN (EQ): ??Q, ??M, ??N, ??P/??/??
    
```

SERIAL

SERIAL: 35  
 REF NUMBER: A31,A32,A33,A34  
 ORIG REF: DOR 44/117,44/120,45/31,45/37  
 REF TITLE: INVASION OF THE MARSHALL ISLANDS (AND 3 OTHER TITLES)  
 DATA SOURCE: ACTION REPORTS

----- SERIAL DATA -----

SIDE 1 COUNTRY: US  
 SIDE 1 UNITS: 20800 MARINES  
 SIDE 1 POSTURE: ATTACKING  
 SIDE 2 COUNTRY: JAPAN  
 SIDE 2 UNITS: EST 3700 MEN  
 SIDE 2 POSTURE: DEFENDING

DATE OF ACTION: 02/01/44  
 COUNTRY: KWAJALEIN ATOLL, MARSHALL ISL  
 REGION: ROI & NAMUR ISLANDS  
 TERRAIN: PACIFIC ISLANDS  
 WEATHER: ??  
 TIME: 1157

SERIAL TACTICS: NAVAL, AERIAL, AND ARTY BOMBARDMENT IN SUPPORT OF AMPHIBIOUS LANDING

NO. BMBRD TARGETS: 1  
 NO. PHASES/TGT: 1

----- TARGET DATA -----

BOMBARD TARGET: PHASE LEVEL

BOMBARD TGT AREA: PHASE LEVEL  
 BOMBARD TACTICS: TARGET LEVEL

----- FIRING DATA -----

FIRE UNIT: PHASE LEVEL  
 TYPE WEAPONS: PHASE LEVEL  
 NUMBER TUBES: PHASE LEVEL  
 TYPE AMMO: PHASE LEVEL  
 ROUNDS PER GUN: PHASE LEVEL  
 NUMBER ROUNDS: PHASE LEVEL  
 FIRE DURATION: TARGET LEVEL AND PHASE LEVEL

----- RESULTS DATA -----

ATTACK DELAY TIME: ??  
 TIME TO OBJECTIVE: 9 HOURS (ROI), 26 HOURS (NAMUR)  
 CASUALTIES: EST 3700 KIA (JAPANESE); 194 KIA, 438 WIA (US)  
 EQUIPMENT DAMAGE: PILLBOXES AND 5 IN GUNS DESTROYED (JAPANESE); ?? (US)  
 OTHER FACTORS: JAPANESE ON SMALL ISLAND, SURROUNDED BY HOSTILE FORCES, WITH NO AVENUE OF ESCAPE  
 OTHER RESULTS: ASSAULT WAVES HAD NO REAL OPPOSITION BUT CONSIDERABLE OPPOSITION IN NORTH NAMUR  
 SUPPRESSION: NO ESTIMATES GIVEN BUT CASUALTIES CONSIDERED LIGHT FOR THE NUMBER OF DEFENDERS

----- CALCULATED DATA -----

RDS/SQ YD: PHASE LEVEL  
 RDS/SQ YD/MIN: PHASE LEVEL  
 LBS/SQ YD: PHASE LEVEL  
 LBS/SQ YD/MIN: PHASE LEVEL  
 LBS/SQ YD (EQ): PHASE LEVEL  
 LBS/SQ YD/MIN (EQ): PHASE LEVEL

## TARGET

SERIAL:	35
TARGET NUMBER:	1
NUMBER PHASES:	1
TIME:	1157
----- TARGET DATA -----	
TARGET:	PHASE LEVEL
TARGET AREA:	PHASE LEVEL
TARGET TACTICS:	NAVAL, AERIAL, AND ARTY BOMBARDMENT IN SUPPORT OF AMPHIBIOUS ASSAULT AND SUBSEQUENT OPERATIONS
----- FIRING DATA -----	
FIRE UNIT:	PHASE LEVEL
TYPE WEAPONS:	PHASE LEVEL
NUMBER TUBES:	PHASE LEVEL
TYPE AMMO:	PHASE LEVEL
ROUNDS PER GUN:	PHASE LEVEL
NUMBER ROUNDS:	PHASE LEVEL
FIRE DURATION:	4 DAYS
----- RESULTS DATA -----	
ATTACK DELAY TIME:	SERIAL LEVEL
TIME TO OBJECTIVE:	SERIAL LEVEL
CASUALTIES:	SERIAL LEVEL
EQUIPMENT DAMAGE:	SERIAL LEVEL
OTHER FACTORS:	SERIAL LEVEL
OTHER RESULTS:	SERIAL LEVEL
SUPPRESSION:	SERIAL LEVEL
----- CALCULATED DATA -----	
RDS/SQ YD:	PHASE LEVEL
RDS/SQ YD/MIN:	PHASE LEVEL
LBS/SQ YD:	PHASE LEVEL
LBS/SQ YD/MIN:	PHASE LEVEL
LBS/SQ YD (EQ):	PHASE LEVEL
LBS/SQ YD/MIN (EQ):	PHASE LEVEL

## PHASE

SERIAL:	35
TARGET NUMBER:	1
PHASE NUMBER:	1
TIME:	1157
----- TARGET DATA -----	
TARGET:	ENTIRE ISLANDS OF ROI AND NAMUR TO INCLUDE ASSAULT BEACHES
TARGET AREA:	1120000 (ROI) AND 750000 (NAMUR)
PHASE TACTICS:	??
----- FIRING DATA -----	
FIRE UNIT:	NAVAL/AERIAL/ARTY
TYPE WEAPONS:	Q, M, N, R, S, P, V, ??/FF, J
NUMBER TUBES:	??Q, M, N, R, S, P, V, ??/38FF, 12J
TYPE AMMO:	HC&AP Q, HE M, HC&AP M, HC R, AP S, AP P, RCKT V, ??/??FF, ??J
ROUNDS PER GUN:	??Q, ??M, ??N, ??R, ??S, ??P, ??V, ??/??FF, ??J
NUMBER ROUNDS:	1582Q, 783M, 1414N, 3143R, 210S, 20891P, 2400V, ??/4572FF, 107J
FIRE DURATION:	4 DAYS
----- RESULTS DATA -----	
ATTACK DELAY TIME:	SERIAL LEVEL
TIME TO OBJECTIVE:	SERIAL LEVEL
CASUALTIES:	SERIAL LEVEL
EQUIPMENT DAMAGE:	SERIAL LEVEL
OTHER FACTORS:	SERIAL LEVEL
OTHER RESULTS:	SERIAL LEVEL
SUPPRESSION:	SERIAL LEVEL
----- CALCULATED DATA -----	
RDS/SQ YD:	.000848Q, .000419M, .000756M, .00168R, .000112S, .0111P, .00128V, ??/.00244F, .00245J
RDS/SQ YD/MIN:	??Q, ??M, ??N, ??R, ??S, ??P, ??V, ??/??FF, ??J
LBS/SQ YD:	1.618Q, .534M, .1932N, .176R, .0118S, .609P, .0321V, .191/.0449(FF&J)
LBS/SQ YD/MIN:	??Q, ??M, ??N, ??R, ??S, ??P, ??V, ??/??FF, ??J
LBS/SQ YD (EQ):	.1618Q, .0695M, .07697N, .0888R, .00642S, .396P, .0481V, .191/.0449(FF&J)
LBS/SQ YD/MIN (EQ):	??Q, ??M, ??N, ??R, ??S, ??P, ??V, ??/??FF, ??J

## SERIAL

SERIAL: 36  
 REF NUMBER: A31,A32,A33,A34  
 ORIG REF: DOR 44/117,44/120,45/31,45/37  
 REF TITLE: INVASION OF THE MARSHALL ISLANDS (AND 3 OTHER TITLES)  
 DATA SOURCE: ACTION REPORTS

### ----- SERIAL DATA -----

SIDE 1 COUNTRY: US  
 SIDE 1 UNITS: EST 15000 MEN  
 SIDE 1 POSTURE: ATTACKING  
 SIDE 2 COUNTRY: JAPAN  
 SIDE 2 UNITS: 3778 MEN  
 SIDE 2 POSTURE: DEFENDING

DATE OF ACTION: 02/01/44  
 COUNTRY: KWAJALEIN ATOLL, MARSHALL ISL  
 REGION: KWAJALEIN ISLAND  
 TERRAIN: PACIFIC ISLAND  
 WEATHER: ??  
 TIME: 1157

SERIAL TACTICS: NAVAL, AERIAL, AND ARTY BOMBARDMENT IN SUPPORT OF AMPHIBIOUS LANDINGS

NO. BMBRD TARGETS: 2  
 NO. PHASES/TGT: 1/1

### ----- TARGET DATA -----

BOMBARD TARGET: PHASE LEVEL

BOMBARD TGT AREA: PHASE LEVEL  
 BOMBARD TACTICS: TARGET LEVEL

### ----- FIRING DATA -----

FIRE UNIT: PHASE LEVEL  
 TYPE WEAPONS: PHASE LEVEL  
 NUMBER TUBES: PHASE LEVEL  
 TYPE AMMO: PHASE LEVEL  
 ROUNDS PER GUN: PHASE LEVEL  
 NUMBER ROUNDS: PHASE LEVEL  
 FIRE DURATION: TARGET LEVEL AND PHASE LEVEL

### ----- RESULTS DATA -----

ATTACK DELAY TIME: ??  
 TIME TO OBJECTIVE: 78 HOURS TO CAPTURE ISLAND  
 CASUALTIES: 3612 KIA, 126 POW (JAPANESE); 157 KIA, 712 WIA, 17 MIA (US)  
 EQUIPMENT DAMAGE: MOST POSITIONS DESTROYED (JAPANESE); ?? (US)  
 OTHER FACTORS: JAPANESE ON SMALL ISLAND, SURROUNDED BY HOSTILE FORCES WITH NO AVENUE OF ESCAPE  
 OTHER RESULTS: SLIGHT OPPOSITION ON BEACHES - DESPERATE DEFENSE MET INLAND  
 SUPPRESSION: NO ESTIMATES GIVEN BUT CASUALTIES CONSIDERED LIGHT FOR NUMBER OF DEFENDERS

### ----- CALCULATED DATA -----

RDS/SQ YD: PHASE LEVEL  
 RDS/SQ YD/MIN: PHASE LEVEL  
 LBS/SQ YD: PHASE LEVEL  
 LBS/SQ YD/MIN: PHASE LEVEL  
 LBS/SQ YD (EQ): PHASE LEVEL  
 LBS/SQ YD/MIN (EQ): PHASE LEVEL

## TARGET

SERIAL:	36
TARGET NUMBER:	1
NUMBER PHASES:	1
TIME:	D-1 TO D+4
----- TARGET DATA -----	
TARGET:	PHASE LEVEL
TARGET AREA:	PHASE LEVEL
TARGET TACTICS:	NAVAL, AERIAL, AND ARTY BOMBARDMENT IN SUPPORT OF AMPHIBIOUS ASSAULT A NO SUBSEQUENT OPERATIONS
----- FIRING DATA -----	
FIRE UNIT:	PHASE LEVEL
TYPE WEAPONS:	PHASE LEVEL
NUMBER TUBES:	PHASE LEVEL
TYPE AMMO:	PHASE LEVEL
ROUNDS PER GUN:	PHASE LEVEL
NUMBER ROUNDS:	PHASE LEVEL
FIRE DURATION:	5 DAYS
----- RESULTS DATA -----	
ATTACK DELAY TIME:	SERIAL LEVEL
TIME TO OBJECTIVE:	SERIAL LEVEL
CASUALTIES:	SERIAL LEVEL
EQUIPMENT DAMAGE:	SERIAL LEVEL
OTHER FACTORS:	SERIAL LEVEL
OTHER RESULTS:	SERIAL LEVEL
SUPPRESSION:	SERIAL LEVEL
----- CALCULATED DATA -----	
RDS/SQ YD:	PHASE LEVEL
RDS/SQ YD/MIN:	PHASE LEVEL
LBS/SQ YD:	PHASE LEVEL
LBS/SQ YD/MIN:	PHASE LEVEL
LBS/SQ YD (EQ):	PHASE LEVEL
LBS/SQ YD/MIN (EQ):	PHASE LEVEL

## PHASE

SERIAL:	36
TARGET NUMBER:	1
PHASE NUMBER:	1
TIME:	D-1 TO D+4
----- TARGET DATA -----	
TARGET:	ENTIRE ISLAND, INCLUDING TARGET 2 ASSAULT BEACH
TARGET AREA:	2590000
PHASE TACTICS:	??
----- FIRING DATA -----	
FIRE UNIT:	NAVAL/AERIAL/ARTY
TYPE WEAPONS:	Q, M, N, P, ??/??/??
NUMBER TUBES:	??Q, M, N, P, ??/1200, 48J
TYPE AMMO:	MC Q, HCBAP M, MC M, ?? P, ??/??/??
ROUNDS PER GUN:	??Q, ??M, ??N, ??P, ??/??/??
NUMBER ROUNDS:	627Q, 2736M, 766N, 18467P, ??/249400, 51845J
FIRE DURATION:	5 DAYS
----- RESULTS DATA -----	
ATTACK DELAY TIME:	SERIAL LEVEL
TIME TO OBJECTIVE:	SERIAL LEVEL
CASUALTIES:	SERIAL LEVEL
EQUIPMENT DAMAGE:	SERIAL LEVEL
OTHER FACTORS:	SERIAL LEVEL
OTHER RESULTS:	SERIAL LEVEL
SUPPRESSION:	SERIAL LEVEL
----- CALCULATED DATA -----	
RDS/SQ YD:	.0002420, .00135M, .0003N, .0081P, ??/.00098300, .02J
RDS/SQ YD/MIN:	??Q, ??M, ??N, ??P, ??/??/??
LBS/SQ YD:	.46Q, 1.349M, .0757N, .372P, .185/.097300, .861J
LBS/SQ YD/MIN:	??Q, ??M, ??N, ??P, ??/??/??
LBS/SQ YD (EQ):	.046Q, .1753M, .0301N, .242P, .185/.048600, .529J
LBS/SQ YD/MIN (EQ):	??Q, ??M, ??N, ??P, ??/??/??

## TARGET

```

SERIAL:          36
TARGET NUMBER:   2
NUMBER PHASES:   1
TIME:            H-1 TO H
----- TARGET DATA -----
TARGET:          PHASE LEVEL

TARGET AREA:     PHASE LEVEL
TARGET TACTICS:  NAVAL, AERIAL, AND ARTY BOMBARDMENT IN SUPPORT OF AMPHIBIOUS ASSAULT

----- FIRING DATA -----
FIRE UNIT:       PHASE LEVEL
TYPE WEAPONS:    PHASE LEVEL
NUMBER TUBES:    PHASE LEVEL
TYPE AMMO:       PHASE LEVEL
ROUNDS PER GUN: PHASE LEVEL
NUMBER ROUNDS:  PHASE LEVEL
FIRE DURATION:   60

----- RESULTS DATA -----
ATTACK DELAY TIME: SERIAL LEVEL
TIME TO OBJECTIVE: SERIAL LEVEL
CASUALTIES:       SERIAL LEVEL
EQUIPMENT DAMAGE: SERIAL LEVEL
OTHER FACTORS:    SERIAL LEVEL

OTHER RESULTS:   SERIAL LEVEL
SUPPRESSION:     SERIAL LEVEL

----- CALCULATED DATA -----
RDS/SQ YD:       PHASE LEVEL
RDS/SQ YD/MIN:   PHASE LEVEL
LBS/SQ YD:       PHASE LEVEL
LBS/SQ YD/MIN:   PHASE LEVEL
LBS/SQ YD (EQ):  PHASE LEVEL
LBS/SQ YD/MIN (EQ): PHASE LEVEL
    
```

## PHASE

```

SERIAL:          36
TARGET NUMBER:   2
PHASE NUMBER:    1
TIME:            H-1 TO H
----- TARGET DATA -----
TARGET:          LANDING BEACH

TARGET AREA:     300000
PHASE TACTICS:   ??

----- FIRING DATA -----
FIRE UNIT:       NAVAL/AERIAL/ARTY
TYPE WEAPONS:    M, N, P/??/??/??/??
NUMBER TUBES:    ??M, N, P/??/1200, 48J
TYPE AMMO:       HCBAP M, HC N, ?? P/??/??
ROUNDS PER GUN: ??M, ??N, ??P/??/??/??/??
NUMBER ROUNDS:  1611M, 482N, 6000P/??/130000, 18000J
FIRE DURATION:   60

----- RESULTS DATA -----
ATTACK DELAY TIME: SERIAL LEVEL
TIME TO OBJECTIVE: SERIAL LEVEL
CASUALTIES:       SERIAL LEVEL
EQUIPMENT DAMAGE: SERIAL LEVEL
OTHER FACTORS:    SERIAL LEVEL

OTHER RESULTS:   SERIAL LEVEL
SUPPRESSION:     SERIAL LEVEL

----- CALCULATED DATA -----
RDS/SQ YD:       .00537M, .0015M, .02P/??/.004300, .06J
RDS/SQ YD/MIN:   ??M, ??N, ??P/??/??/??/??
LBS/SQ YD:       6.92M, .343N, 0.92P/.287/.43800, 1.981J
LBS/SQ YD/MIN:   ??M, ??N, ??P/??/??/??/??
LBS/SQ YD (EQ):  .792M, .137N, .598P/.287/.21900, 1.585J
LBS/SQ YD/MIN (EQ): ??M, ??N, ??P/??/??/??/??
    
```



SERIAL

SERIAL: 37  
 REF NUMBER: A31,A32,A33,A34  
 ORIG REF: DOR 44/117.44/120.45/31.45/37  
 REF TITLE: INVASION OF THE MARSHALL ISLANDS (AND 3 OTHER TITLES)  
 DATA SOURCE: ACTION REPORTS

----- SERIAL DATA -----

SIDE 1 COUNTRY: US  
 SIDE 1 UNITS: EST 7000 MEN  
 SIDE 1 POSTURE: ATTACKING  
 SIDE 2 COUNTRY: JAPAN  
 SIDE 2 UNITS: 454 MEN  
 SIDE 2 POSTURE: DEFENDING

DATE OF ACTION: 02/03/44  
 COUNTRY: KWAJALEIN ATOLL, MARSHALL ISL  
 REGION: EBEYE (BURTON) ISLAND  
 TERRAIN: PACIFIC ISLAND  
 WEATHER: ??  
 TIME: ??

SERIAL TACTICS: NAVAL, AERIAL, AND ARTY BOMBARDMENT IN SUPPORT OF AMPHIBIOUS LANDING

NO. BMBRD TARGETS: 1  
 NO. PHASES/TGT: 1

----- TARGET DATA -----

BOMBARD TARGET: PHASE LEVEL  
 BOMBARD TGT AREA: PHASE LEVEL  
 BOMBARD TACTICS: TARGET LEVEL

----- FIRING DATA -----

FIRE UNIT: PHASE LEVEL  
 TYPE WEAPONS: PHASE LEVEL  
 NUMBER TUBES: PHASE LEVEL  
 TYPE AMMO: PHASE LEVEL  
 ROUNDS PER GUN: PHASE LEVEL  
 NUMBER ROUNDS: PHASE LEVEL  
 FIRE DURATION: TARGET LEVEL AND PHASE LEVEL

----- RESULTS DATA -----

ATTACK DELAY TIME: ??  
 TIME TO OBJECTIVE: 2 DAYS  
 CASUALTIES: 445 KIA, 9 POW (JAPANESE); 7 KIA, 51 WIA (US)  
 EQUIPMENT DAMAGE: ??; ??  
 OTHER FACTORS: JAPANESE ON SMALL ISLAND, SURROUNDED BY HOSTILE FORCES WITH NO AVENUE  
 OF ESCAPE  
 OTHER RESULTS: ??  
 SUPPRESSION: NO ESTIMATES GIVEN

----- CALCULATED DATA -----

RDS/SQ YD: PHASE LEVEL  
 RDS/SQ YD/MIN: PHASE LEVEL  
 LBS/SQ YD: PHASE LEVEL  
 LBS/SQ YD/MIN: PHASE LEVEL  
 LBS/SQ YD (EQ): PHASE LEVEL  
 LBS/SQ YD/MIN (EQ): PHASE LEVEL

## TARGET

SERIAL	37
TARGET NUMBER	1
NUMBER PHASES	1
TIME	??
----- TARGET DATA -----	
TARGET	PHASE LEVEL
TARGET AREA	PHASE LEVEL
TARGET TACTICS	NAVAL, AERIAL, AND ARTY BOMBARDMENT IN SUPPORT OF AMPHIBIOUS ASSAULT AND SUBSEQUENT OPERATIONS
----- FIRING DATA -----	
FIRE UNIT	PHASE LEVEL
TYPE WEAPONS	PHASE LEVEL
NUMBER TUBES	PHASE LEVEL
TYPE AMMO	PHASE LEVEL
ROUNDS PER GUN	PHASE LEVEL
NUMBER ROUNDS	PHASE LEVEL
FIRE DURATION	??
----- RESULTS DATA -----	
ATTACK DELAY TIME	SERIAL LEVEL
TIME TO OBJECTIVE	SERIAL LEVEL
CASUALTIES	SERIAL LEVEL
EQUIPMENT DAMAGE	SERIAL LEVEL
OTHER FACTORS	SERIAL LEVEL
OTHER RESULTS	SERIAL LEVEL
SUPPRESSION	SERIAL LEVEL
----- CALCULATED DATA -----	
RDS/SQ YD	PHASE LEVEL
RDS/SQ YD/MIN	PHASE LEVEL
LBS/SQ YD	PHASE LEVEL
LBS/SQ YD/MIN	PHASE LEVEL
LBS/SQ YD (EQ)	PHASE LEVEL
LBS/SQ YD/MIN (EQ)	PHASE LEVEL

## PHASE

SERIAL	37
TARGET NUMBER	1
PHASE NUMBER	1
TIME	??
----- TARGET DATA -----	
TARGET	ENTIRE ISLAND TO INCLUDE /
TARGET AREA	450000
PHASE TACTICS	??
----- FIRING DATA -----	
FIRE UNIT	NAVAL/AERIAL/ARTY
TYPE WEAPONS	Q,M,N,P/??/??/??
NUMBER TUBES	?? Q,M,N,P/??/1200, 40J
TYPE AMMO	MC O, MC M, AP, MC W, ?? P/??/??/??, ??J
ROUNDS PER GUN	??Q, ??M, ??N, ??P/??/??/??, ??J
NUMBER ROUNDS	124Q, 467M, 1230N, 3755P/??/135200, 8540J
FIRE DURATION	??
----- RESULTS DATA -----	
ATTACK DELAY TIME	SERIAL LEVEL
TIME TO OBJECTIVE	SERIAL LEVEL
CASUALTIES	SERIAL LEVEL
EQUIPMENT DAMAGE	SERIAL LEVEL
OTHER FACTORS	SERIAL LEVEL
OTHER RESULTS	SERIAL LEVEL
SUPPRESSION	SERIAL LEVEL
----- CALCULATED DATA -----	
RDS/SQ YD	.000278Q, .00103M, .00274N, .00834P/??/.00200, .019J
RDS/EQ YD/MIN	??Q, ??M, ??N, ??P/??/??/??, ??J
LBS/SQ YD	.524Q, 1.324M, .702N, .436P/ .387/.30200, .627J
LBS/SQ YD/MIN	??Q, ??M, ??N, ??P/??/??/??, ??J
LBS/SQ YD (EQ)	.0524Q, .172M, .2136N, .281P/ .387/ .15100, .501J
LBS/SQ YD/MIN (EQ)	??Q, ??M, ??N, ??P/??/??/??, ??J

## SERIAL

SERIAL: 38  
 REF NUMBER: A33  
 ORIG REF: OOR 45/31  
 REF TITLE: LANDINGS ON PACIFIC ISLANDS  
 DATA SOURCE: ACTION REPORTS

### ----- SERIAL DATA -----

SIDE 1 COUNTRY: US  
 SIDE 1 UNITS: 2 ASSAULT FORCES: 1) 2 DIV (48,400 MEN) AND 2) ??  
 SIDE 1 POSTURE: ATTACKING  
 SIDE 2 COUNTRY: JAPAN  
 SIDE 2 UNITS: EST 21,000 TROOPS  
 SIDE 2 POSTURE: DEFENDING

DATE OF ACTION: 10/20/44  
 COUNTRY: PHILIPPINES  
 REGION: LEYTE  
 TERRAIN: PACIFIC BEACHES  
 WEATHER: ??  
 TIME: 1000

SERIAL TACTICS: AMPHIBIOUS LANDINGS BY TWO ASSAULT FORCES 15 MILES APART SUPPORTED BY NAVAL AND AERIAL BOMBARDMENT

NO. BMBRD TARGETS: 2  
 NO. PHASES/TGT: 1/1

### ----- TARGET DATA -----

BOMBARD TARGET: PHASE LEVEL

BOMBARD TGT AREA: PHASE LEVEL  
 BOMBARD TACTICS: TARGET LEVEL

### ----- FIRING DATA -----

FIRE UNIT: PHASE LEVEL  
 TYPE WEAPONS: PHASE LEVEL  
 NUMBER TUBES: PHASE LEVEL  
 TYPE AMMO: PHASE LEVEL  
 ROUNDS PER GUN: PHASE LEVEL  
 NUMBER ROUNDS: PHASE LEVEL  
 FIRE DURATION: TARGET LEVEL AND PHASE LEVEL

### ----- RESULTS DATA -----

ATTACK DELAY TIME: TARGET LEVEL  
 TIME TO OBJECTIVE: TARGET LEVEL  
 CASUALTIES: TARGET LEVEL  
 EQUIPMENT DAMAGE: TARGET LEVEL  
 OTHER FACTORS: TARGET LEVEL

OTHER RESULTS: TARGET LEVEL  
 SUPPRESSION: TARGET LEVEL

### ----- CALCULATED DATA -----

RDS/SQ YD: PHASE LEVEL  
 RDS/FO YD/MIN: PHASE LEVEL  
 LBS/SQ YD: PHASE LEVEL  
 LBS/SQ YD/MIN: PHASE LEVEL  
 LBS/SQ YD (EQ): PHASE LEVEL  
 LBS/SQ YD/MIN (EQ): PHASE LEVEL

## TARGET

SERIAL	30
TARGET NUMBER	1
NUMBER PHASES:	1
TIME	1000
----- TARGET DATA -----	
TARGET	PHASE LEVEL
TARGET AREA	PHASE LEVEL
TARGET TACTICS	NAVAL AND AERIAL BOMBARDMENT FOR 3 HOURS PRIOR TO ASSAULT LANDING BY 2 DIV (48,400 MEN)
----- FIRING DATA -----	
FIRE UNIT	PHASE LEVEL
TYPE WEAPONS	PHASE LEVEL
NUMBER TUBES	PHASE LEVEL
TYPE AMMO	PHASE LEVEL
ROUNDS PER GUN	PHASE LEVEL
NUMBER ROUNDS	PHASE LEVEL
FIRE DURATION	180
----- RESULTS DATA -----	
ATTACK DELAY TIME	??
TIME TO OBJECTIVE	??
CASUALTIES	87 KIA, 1 POW (JAPANESE), 6 KIA, 12 MIA (US)
EQUIPMENT DAMAGE	??, ??
OTHER FACTORS	ONLY 100 JAPANESE OPPOSED LANDINGS WITH SOME MORTAR, MG, ARTY, AND RIFL E FIRE
OTHER RESULTS	BEACHES CLEARED BY H-33
SUPPRESSION	??
----- CALCULATED DATA -----	
ROS/SQ YD	PHASE LEVEL
ROS/SQ YD/MIN	PHASE LEVEL
LBS/SQ YD	PHASE LEVEL
LBS/SQ YD/MIN	PHASE LEVEL
LBS/SQ YD (EQ)	PHASE LEVEL
LBS/SQ YD/MIN (EQ)	PHASE LEVEL

## PHASE

SERIAL	30
TARGET NUMBER	1
PHASE NUMBER	1
TIME	1000
----- TARGET DATA -----	
TARGET	2 BEACHES, EACH 2000 YDS WIDE AND 800 YDS DEEP, AND DEFENDING JAPANESE POSITIONS
TARGET AREA	3200000
TARGET TACTICS	??
----- FIRING DATA -----	
FIRE UNIT	NAVAL FIRE SUPPORT/AERIAL BOMBING SUPPORT
TYPE WEAPONS	O, M, N, R, P, U, V/AA, BB
NUMBER TUBES	???, M, N, R, P, U, V/??AA, ??BB
TYPE AMMO	MC O, MC M, MC N, MC R, ?? P, ?? U, RCAT V/??AA, ??BB
ROUNDS PER GUN	???, M, N, R, P, U, V/??AA, ??BB
NUMBER ROUNDS	2400, 210M, 1024N, 3000R, 6900P, 1200U, 6500V/??AA, ??BB
FIRE DURATION	180
----- RESULTS DATA -----	
ATTACK DELAY TIME	TARGET LEVEL
TIME TO OBJECTIVE	TARGET LEVEL
CASUALTIES	TARGET LEVEL
EQUIPMENT DAMAGE	TARGET LEVEL
OTHER FACTORS	TARGET LEVEL
OTHER RESULTS	TARGET LEVEL
SUPPRESSION	TARGET LEVEL
----- CALCULATED DATA -----	
ROS/SQ YD	000075Q, 000080M, 0003B, 0011R, 0022P, 0003BU, 002V/??AA, ??BB
ROS/SQ YD/MIN	???, M, N, R, P, U, V/??AA, ??BB
LBS/SQ YD	140, 080M, 081M, 12R, 11P, 014U, 051V/??AA, ??BB
LBS/SQ YD/MIN	???, M, N, R, P, U, V/??AA, ??BB
LBS/SQ YD (EQ)	014Q, 011M, 033N, 050P, 073P, 011U, 076V/??AA, ??BB
LBS/SQ YD/MIN (EQ)	???, M, N, R, P, U, V/??AA, ??BB

## TARGET

SERIAL:	38
TARGET NUMBER:	2
NUMBER PHASES:	1
TIME:	1000
----- TARGET DATA -----	
TARGET:	PHASE LEVEL
TARGET AREA:	PHASE LEVEL
TARGET TACTICS:	NAVAL AND AERIAL BOMBARDMENT FOR 3 HOURS PRIOR TO ASSAULT LANDING BY ?? DIV (?? MEN)
----- FIRING DATA -----	
FIRE UNIT:	PHASE LEVEL
TYPE WEAPONS:	PHASE LEVEL
NUMBER TUBES:	PHASE LEVEL
TYPE AMMO:	PHASE LEVEL
ROUNDS PER GUN:	PHASE LEVEL
NUMBER ROUNDS:	PHASE LEVEL
FIRE DURATION:	180
----- RESULTS DATA -----	
ATTACK DELAY TIME:	??
TIME TO OBJECTIVE:	??
CASUALTIES:	??;??
EQUIPMENT DAMAGE:	??;??
OTHER FACTORS:	JAPANESE OPPOSED LANDINGS WITH MORTAR, SMIPING, MG, ARTY, AND RIFLE FIRE
OTHER RESULTS:	E BEACHES CLEARED BY M-3.5
SUPPRESSION:	??
----- CALCULATED DATA -----	
RDS/SQ YD:	PHASE LEVEL
RDS/SQ YD/MIN:	PHASE LEVEL
LBS/SQ YD:	PHASE LEVEL
LBS/SQ YD/MIN:	PHASE LEVEL
LBS/SQ YD (EQ):	PHASE LEVEL
LBS/SQ YD/MIN (EQ):	PHASE LEVEL

## PHASE

SERIAL:	38
TARGET NUMBER:	2
PHASE NUMBER:	1
TIME:	1000
----- TARGET DATA -----	
TARGET:	1 BEACH, 2400 YDS WIDE AND 800 YDS DEEP
TARGET AREA:	1920000
PHASE TACTICS:	??
----- FIRING DATA -----	
FIRE UNIT:	NAVAL FIRE SUPPORT/AERIAL BOMBING SUPPORT
TYPE WEAPONS:	M, N, R, CC, V, W/AA, 80
NUMBER TUBES:	??M, N, R, CC, V, W/??AA, ??BB
TYPE AMMO:	MC M, MC N, MC R, AAC CC, RCKT V, MORTAR W/??AA, ??BB
ROUNDS PER GUN:	??M, N, R, CC, V, W/??AA, ??BB
NUMBER ROUNDS:	682M, 882N, 1308R, 7056CC, 1870V, 2840W/??AA, ??BB
FIRE DURATION:	180
----- RESULTS DATA -----	
ATTACK DELAY TIME:	TARGET LEVEL
TIME TO OBJECTIVE:	TARGET LEVEL
CASUALTIES:	TARGET LEVEL
EQUIPMENT DAMAGE:	TARGET LEVEL
OTHER FACTORS:	TARGET LEVEL
OTHER RESULTS:	TARGET LEVEL
SUPPRESSION:	TARGET LEVEL
----- CALCULATED DATA -----	
RDS/SQ YD:	00034M, 0003N, 00068R, 0037CC, 00087V, 0014W/??AA, ??BB
RDS/SQ YD/MIN:	??M, N, R, CC, V, W/??AA, ??BB
LBS/SQ YD:	.44M, .078N, .072N, .19CC, .022V, .028W/??AA, ??BB
LBS/SQ YD/MIN:	??M, N, R, CC, V, W/??AA, ??BB
LBS/SQ YD (EQ):	.057M, .031N, .038R, .12CC, .033V, .021W/??AA, ??BB
LBS/SQ YD/MIN (EQ):	??M, N, R, CC, V, W/??AA, ??BB



## SERIAL

SERIAL: 39  
 REF NUMBER: A32,A33  
 ORIG REF: DOR 44/120.DOR 45/31  
 REF TITLE: COMPARISON OF LANDING OPERATIONS  
 DATA SOURCE: ACTION REPORTS

----- SERIAL DATA -----

SIDE 1 COUNTRY: US  
 SIDE 1 UNITS: TWO MARINE DIVISIONS AND LANDING SUPPORT FORCES  
 SIDE 1 POSTURE: ATTACKING  
 SIDE 2 COUNTRY: JAPAN  
 SIDE 2 UNITS: EST. 29,000 TROOPS  
 SIDE 2 POSTURE: DEFENDING

DATE OF ACTION: 06/15/44  
 COUNTRY: MARIANA ISLANDS  
 REGION: SAIPAN  
 TERRAIN: PACIFIC BEACH  
 WEATHER: ??  
 TIME: 0840

SERIAL TACTICS: AMPHIBIOUS LANDING SUPPORTED BY NAVAL AND AERIAL BOMBARDMENT

NO. BMBRD TARGETS: 1  
 NO. PHASES/TGT: 3

----- TARGET DATA -----

BOMBARD TARGET: TARGET LEVEL  
 BOMBARD TGT AREA: TARGET LEVEL  
 BOMBARD TACTICS: TARGET LEVEL

----- FIRING DATA -----

FIRE UNIT: PHASE LEVEL  
 TYPE WEAPONS: PHASE LEVEL  
 NUMBER TUBES: PHASE LEVEL  
 TYPE AMMO: PHASE LEVEL  
 ROUNDS PER GUN: PHASE LEVEL  
 NUMBER ROUNDS: PHASE LEVEL  
 FIRE DURATION: TARGET LEVEL AND PHASE LEVEL

----- RESULTS DATA -----

ATTACK DELAY TIME: ??  
 TIME TO OBJECTIVE: ??  
 CASUALTIES: ?? (JAPAN):142 KIA, 711 WIA (US)  
 EQUIPMENT DAMAGE: ?? (JAPANESE):LCIS AND LVTS DAM BY ARTY FIRE (US)  
 OTHER FACTORS: NAVAL AND AERIAL BOMBARDMENT FROM D-4 TO D

OTHER RESULTS: INITIAL ASSAULT WAVES MET NO RESISTANCE, WAVE 4 HIT HEAVY BY ARTY  
 SUPPRESSION: FORCE CMOR SAID "BMBRD DESTR OR NEUTR GREAT MANY IMPORTANT TARGETS AN  
 D NEUTRALIZED BEACHES SUFFICIENTLY THAT ASSAULT FORCES WERE ABLE TO  
 EFFECT A LANDING BUT ARTY IN REAR OF BEACHES NOT SILENCED"

----- CALCULATED DATA -----

RDS/SQ YD: PHASE LEVEL  
 RDS/SQ YD/MIN: PHASE LEVEL  
 LBS/SQ YD: PHASE LEVEL  
 LBS/SQ YD/MIN: PHASE LEVEL  
 LBS/SQ YD (EQ): PHASE LEVEL  
 LBS/SQ YD/MIN (EQ):PHASE LEVEL

## TARGET

SERIAL:	39
TARGET NUMBER:	1
NUMBER PHASES:	3
TIME:	0840
----- TARGET DATA -----	
TARGET:	PACIFIC BEACH (6000 YDS WIDE X 1000 YDS DEEP) AND DEFENDING JAPANESE POSITIONS
TARGET AREA:	5000000
TARGET TACTICS:	NAVAL AND AERIAL BOMBARDMENT FOR 100 MINUTES PRIOR TO ASSAULT LANDING BY 2 MARINE DIV (48,388 MEN)
----- FIRING DATA -----	
FIRE UNIT:	PHASE LEVEL
TYPE WEAPONS:	PHASE LEVEL
NUMBER TUBES:	PHASE LEVEL
TYPE AMMO:	PHASE LEVEL
ROUNDS PER GUN:	PHASE LEVEL
NUMBER ROUNDS:	PHASE LEVEL
FIRE DURATION:	100
----- RESULTS DATA -----	
ATTACK DELAY TIME:	SERIAL LEVEL
TIME TO OBJECTIVE:	SERIAL LEVEL
CASUALTIES:	SERIAL LEVEL
EQUIPMENT DAMAGE:	SERIAL LEVEL
OTHER FACTORS:	SERIAL LEVEL
OTHER RESULTS:	SERIAL LEVEL
SUPPRESSION:	SERIAL LEVEL
----- CALCULATED DATA -----	
RDS/SQ YD:	PHASE LEVEL
RDS/SQ YD/MIN:	PHASE LEVEL
LBS/SQ YD:	PHASE LEVEL
LBS/SQ YD/MIN:	PHASE LEVEL
LBS/SQ YD (EQ):	PHASE LEVEL
LBS/SQ YD/MIN (EQ):	PHASE LEVEL

## PHASE

SERIAL:	39
TARGET NUMBER:	1
PHASE NUMBER:	1
TIME:	0700
----- TARGET DATA -----	
TARGET:	TARGET LEVEL
TARGET AREA:	TARGET LEVEL
PHASE TACTICS:	??
----- FIRING DATA -----	
FIRE UNIT:	NAVAL AIRCRAFT FROM CARRIERS
TYPE WEAPONS:	STRIKE BOMBERS/TORPEDO BOMBER
NUMBER TUBES:	51/5A
TYPE AMMO:	MISC BOMBS
ROUNDS PER GUN:	??/??
NUMBER ROUNDS:	78500 LB/108000 LB
FIRE DURATION:	25
----- RESULTS DATA -----	
ATTACK DELAY TIME:	SERIAL LEVEL
TIME TO OBJECTIVE:	SERIAL LEVEL
CASUALTIES:	SERIAL LEVEL
EQUIPMENT DAMAGE:	SERIAL LEVEL
OTHER FACTORS:	SERIAL LEVEL
OTHER RESULTS:	SERIAL LEVEL
SUPPRESSION:	SERIAL LEVEL
----- CALCULATED DATA -----	
RDS/SQ YD:	??/??
RDS/SQ YD/MIN:	??/??
LBS/SQ YD:	0120/.0180
LBS/SQ YD/MIN:	??/??
LBS/SQ YD (EQ):	0120/.0180
LBS/SQ YD/MIN (EQ):	??/??

PHASE

SERIAL: 39  
 TARGET NUMBER: 1  
 PHASE NUMBER: 2  
 TIME: 0740

----- TARGET DATA -----  
 TARGET: TARGET LEVEL

TARGET AREA: TARGET LEVEL  
 PHASE TACTICS: ??

----- FIRING DATA -----  
 FIRE UNIT: NAVAL FIRE SUPPORT  
 TYPE WEAPONS: M.N.R.P.V  
 NUMBER TUBES: ??M, ??N, ??R, ??P, ??V  
 TYPE AMMO: ??M, ??N, ??R, ??P, ??V  
 ROUNDS PER GUN: ??M, ??N, ??R, ??P, ??V  
 NUMBER ROUNDS: 960M, 450N, 1080R, 11820P, 13200V  
 FIRE DURATION: 60

----- RESULTS DATA -----  
 ATTACK DELAY TIME: SERIAL LEVEL  
 TIME TO OBJECTIVE: SERIAL LEVEL  
 CASUALTIES: SERIAL LEVEL  
 EQUIPMENT DAMAGE: SERIAL LEVEL  
 OTHER FACTORS: SERIAL LEVEL

OTHER RESULTS: SERIAL LEVEL  
 SUPPRESSION: SERIAL LEVEL

----- CALCULATED DATA -----  
 RDS/SQ YD: .00016M, .000075N, .00018R, .00197P, .0022V  
 RDS/SQ YD/MIN: ??M, ??N, ??R, ??P, ??V  
 LBS/SQ YD: .204M, .0197N, .019R, .108P, .055V  
 LBS/SQ YD/MIN: ??M, ??N, ??R, ??P, ??V  
 LBS/SQ YD (EQ): .0287M, .008N, .0097R, .069P, .0823V  
 LBS/SQ YD/MIN (EQ): ??M, ??N, ??R, ??P, ??V

PHASE

SERIAL: 39  
 TARGET NUMBER: 1  
 PHASE NUMBER: 3  
 TIME: 0840

----- TARGET DATA -----  
 TARGET: TARGET LEVEL

TARGET AREA: TARGET LEVEL  
 PHASE TACTICS: ??

----- FIRING DATA -----  
 FIRE UNIT: NAVAL AIRCRAFT FROM CARRIERS  
 TYPE WEAPONS: TORPEDO BOMBERS  
 NUMBER TUBES: 24  
 TYPE AMMO: STRAFING  
 ROUNDS PER GUN: ??  
 NUMBER ROUNDS: ??  
 FIRE DURATION: ??

----- RESULTS DATA -----  
 ATTACK DELAY TIME: SERIAL LEVEL  
 TIME TO OBJECTIVE: SERIAL LEVEL  
 CASUALTIES: SERIAL LEVEL  
 EQUIPMENT DAMAGE: SERIAL LEVEL  
 OTHER FACTORS: SERIAL LEVEL

OTHER RESULTS: SERIAL LEVEL  
 SUPPRESSION: SERIAL LEVEL

----- CALCULATED DATA -----  
 RDS/SQ YD: ??  
 RDS/SQ YD/MIN: ??  
 LBS/SQ YD: ??  
 LBS/SQ YD/MIN: ??  
 LBS/SQ YD (EQ): ??  
 LBS/SQ YD/MIN (EQ): ??



## SERIAL

SERIAL: 40  
 REF NUMBER: A32  
 ORIG REF: DOR 44/120  
 REF TITLE: COMPARISON OF LANDING OPERATIONS  
 DATA SOURCE: ACTION REPORTS

### ----- SERIAL DATA -----

SIDE 1 COUNTRY: US  
 SIDE 1 UNITS: 4TH MARINE DIV  
 SIDE 1 POSTURE: ATTACKING  
 SIDE 2 COUNTRY: JAPAN  
 SIDE 2 UNITS: 8309 TROOPS (3929 ARMY AND 4110 NAVY)  
 SIDE 2 POSTURE: DEFENDING

DATE OF ACTION: 07/24/44  
 COUNTRY: MARIANA ISLANDS  
 REGION: TINIAN  
 TERRAIN: PACIFIC BEACH  
 WEATHER: ??  
 TIME: 0800

SERIAL TACTICS: AMPHIBIOUS LANDING SUPPORTED BY NAVAL, AERIAL, AND ARTILLERY BOMBARDMENT

NO. BMBRD TARGETS: 1  
 NO. PHASES/TGT: 1

### ----- TARGET DATA -----

BOMBARD TARGET: PHASE LEVEL  
 BOMBARD TGT AREA: PHASE LEVEL  
 BOMBARD TACTICS: TARGET LEVEL

### ----- FIRING DATA -----

FIRE UNIT: PHASE LEVEL  
 TYPE WEAPONS: PHASE LEVEL  
 NUMBER TUBES: PHASE LEVEL  
 TYPE AMMO: PHASE LEVEL  
 ROUNDS PER GUN: PHASE LEVEL  
 NUMBER ROUNDS: PHASE LEVEL  
 FIRE DURATION: TARGET LEVEL AND PHASE LEVEL

### ----- RESULTS DATA -----

ATTACK DELAY TIME: ??  
 TIME TO OBJECTIVE: D+8  
 CASUALTIES: 5700 (JAPANESE); 328 KIA, 1571 WIA (US)  
 EQUIPMENT DAMAGE: ?? (JAPANESE); 2 SHIPS DESTROYED (US)  
 OTHER FACTORS: ENTIRE ISLAND WAS TARGET - NO SPECIAL EFFORT TO COVER LANDING BEACHES EXCEPT ON D DAY  
 OTHER RESULTS: OPPOSITION TO LANDING WAS LIGHT; COUNTERATTACK LAUNCHED, THEN DEFEATED  
 SUPPRESSION: JAPANESE COASTAL DEFENSE GUNS WERE NOT NEUTRALIZED

### ----- CALCULATED DATA -----

RDS/SQ YD: PHASE LEVEL  
 RDS/SQ YD/MIN: PHASE LEVEL  
 LBS/SQ YD: PHASE LEVEL  
 LBS/SQ YD/MIN: PHASE LEVEL  
 LBS/SQ YD (EQ): PHASE LEVEL  
 LBS/SQ YD/MIN (EQ): PHASE LEVEL

## TARGET

SERIAL:	40
TARGET NUMBER:	1
NUMBER PHASES:	1
TIME:	0800
----- TARGET DATA -----	
TARGET:	PHASE LEVEL
TARGET AREA:	PHASE LEVEL
TARGET TACTICS:	NAVAL, AERIAL, AND ARTILLERY BOMBARDMENT FROM D-41 TO CAPTURE OF ISLAND ON D+8
----- FIRING DATA -----	
FIRE UNIT:	PHASE LEVEL
TYPE WEAPONS:	PHASE LEVEL
NUMBER TUBES:	PHASE LEVEL
TYPE AMMO:	PHASE LEVEL
ROUNDS PER GUN:	PHASE LEVEL
NUMBER ROUNDS:	PHASE LEVEL
FIRE DURATION:	49 DAYS
----- RESULTS DATA -----	
ATTACK DELAY TIME:	SERIAL LEVEL
TIME TO OBJECTIVE:	SERIAL LEVEL
CASUALTIES:	SERIAL LEVEL
EQUIPMENT DAMAGE:	SERIAL LEVEL
OTHER FACTORS:	SERIAL LEVEL
OTHER RESULTS:	SERIAL LEVEL
SUPPRESSION:	SERIAL LEVEL
----- CALCULATED DATA -----	
RDS/SQ YD:	PHASE LEVEL
RDS/SQ YD/MIN:	PHASE LEVEL
LBS/SQ YD:	PHASE LEVEL
LBS/SQ YD/MIN:	PHASE LEVEL
LBS/SQ YD (EQ):	PHASE LEVEL
LBS/SQ YD/MIN (EQ):	PHASE LEVEL

## PHASE

SERIAL:	40
TARGET NUMBER:	1
PHASE NUMBER:	1
TIME:	0800
----- TARGET DATA -----	
TARGET:	TINIAN ISLAND AND LANDING BEACHES ON D-DAY
TARGET AREA:	APPROX. 50 SQ MILES
PHASE TACTICS:	??
----- FIRING DATA -----	
FIRE UNIT:	NAVAL FIRE SUPPORT/NAVAL AIRCRAFT/ARTILLERY
TYPE WEAPONS:	NAVAL GUNS/NAVAL AIRCRAFT/DDJ
NUMBER TUBES:	??/??/??D, ??J
TYPE AMMO:	??/??/??D, ??J
ROUNDS PER GUN:	??/350/??D, ??J
NUMBER ROUNDS:	??/??/24536 COMBINED
FIRE DURATION:	49 DAYS
----- RESULTS DATA -----	
ATTACK DELAY TIME:	SERIAL LEVEL
TIME TO OBJECTIVE:	SERIAL LEVEL
CASUALTIES:	SERIAL LEVEL
EQUIPMENT DAMAGE:	SERIAL LEVEL
OTHER FACTORS:	SERIAL LEVEL
OTHER RESULTS:	SERIAL LEVEL
SUPPRESSION:	SERIAL LEVEL
----- CALCULATED DATA -----	
RDS/SQ YD:	??/??/??D, ??J
RDS/SQ YD/MIN:	??/??/??D, ??J
LBS/SQ YD:	??/??/??D, ??J
LBS/SQ YD/MIN:	??/??/??D, ??J
LBS/SQ YD (EQ):	??/??/??D, ??J
LBS/SQ YD/MIN (EQ):	??/??/??D, ??J

## SERIAL

SERIAL: 41  
 REF NUMBER: A31, A32, A33, A34  
 ORIG REF: DOR 44/117, 44/120, 45/31, 45/37  
 REF TITLE: COMPARISON OF LANDING OPERATIONS  
 DATA SOURCE: ACTION REPORTS

----- SERIAL DATA -----

SIDE 1 COUNTRY: US  
 SIDE 1 UNITS: 2 ASSAULT FORCES (56534 MEN)  
 SIDE 1 POSTURE: ATTACKING  
 SIDE 2 COUNTRY: JAPAN  
 SIDE 2 UNITS: 18500 TROOPS (13000 ARMY, 5500 NAVY)  
 SIDE 2 POSTURE: DEFENDING

DATE OF ACTION: 07/21/44  
 COUNTRY: MARIANA ISLANDS  
 REGION: GUAM  
 TERRAIN: PACIFIC BEACHES  
 WEATHER: ??  
 TIME: 0830

SERIAL TACTICS: AMPHIBIOUS LANDINGS ON 2 BEACHES SUPPORTED BY NAVAL AND AERIAL BOMBARDMENT  
 NO. BMBRD TARGETS: 1  
 NO. PHASES/TGT: 1

----- TARGET DATA -----

BOMBARD TARGET: PHASE LEVEL  
 BOMBARD TGT AREA: PHASE LEVEL  
 BOMBARD TACTICS: TARGET LEVEL

----- FIRING DATA -----

FIRE UNIT: PHASE LEVEL  
 TYPE WEAPONS: PHASE LEVEL  
 NUMBER TUBES: PHASE LEVEL  
 TYPE AMMO: PHASE LEVEL  
 ROUNDS PER GUN: PHASE LEVEL  
 NUMBER ROUNDS: PHASE LEVEL  
 FIRE DURATION: TARGET LEVEL AND PHASE LEVEL

----- RESULTS DATA -----

ATTACK DELAY TIME: ??  
 TIME TO OBJECTIVE: ??  
 CASUALTIES: ?? (JAPANESE); 105 KIA, 538 WIA, 58 MISSING (US)  
 EQUIPMENT DAMAGE: ?? (JAPANESE); 11 LNDNG CRFT DAMAGED (US)  
 OTHER FACTORS: ??

OTHER RESULTS: 13 DAY BOMBARDMENT PRIOR TO D-DAY DEMORALIZED DEFENDERS  
 SUPPRESSION: BOMBARDMENT ALMOST SILENCED THE DEFENSES

----- CALCULATED DATA -----

RDS/SQ YD: PHASE LEVEL  
 RDS/SQ YD/MIN: PHASE LEVEL  
 LBS/SQ YD: PHASE LEVEL  
 LBS/SQ YD/MIN: PHASE LEVEL  
 LBS/SQ YD (EQ): PHASE LEVEL  
 LBS/SQ YD/MIN (EQ): PHASE LEVEL

## TARGET

SERIAL:	41
TARGET NUMBER:	1
NUMBER PHASES:	1
TIME:	0830
----- TARGET DATA -----	
TARGET:	PHASE LEVEL
TARGET AREA:	PHASE LEVEL
TARGET TACTICS:	NAVAL AND AERIAL BOMBARDMENT IN SUPPORT OF ASSAULT FORCES EFFORT TO SECURE BEACHHEAD
----- FIRING DATA -----	
FIRE UNIT:	PHASE LEVEL
TYPE WEAPONS:	PHASE LEVEL
NUMBER TUBES:	PHASE LEVEL
TYPE AMMO:	PHASE LEVEL
ROUNDS PER GUN:	PHASE LEVEL
NUMBER ROUNDS:	PHASE LEVEL
FIRE DURATION:	??
----- RESULTS DATA -----	
ATTACK DELAY TIME:	SERIAL LEVEL
TIME TO OBJECTIVE:	SERIAL LEVEL
CASUALTIES:	SERIAL LEVEL
EQUIPMENT DAMAGE:	SERIAL LEVEL
OTHER FACTORS:	SERIAL LEVEL
OTHER RESULTS:	SERIAL LEVEL
SUPPRESSION:	SERIAL LEVEL
----- CALCULATED DATA -----	
RDS/SQ YD:	PHASE LEVEL
RDS/SQ YD/MIN:	PHASE LEVEL
LBS/SQ YD:	PHASE LEVEL
LBS/SQ YD/MIN:	PHASE LEVEL
LBS/SQ YD (EQ):	PHASE LEVEL
LBS/SQ YD/MIN (EQ):	PHASE LEVEL

## PHASE

SERIAL:	41
TARGET NUMBER:	1
PHASE NUMBER:	1
TIME:	0830
----- TARGET DATA -----	
TARGET:	2 ASSAULT BEACHES (1500 YDS X 1000 YDS AND 2000 YDS X 1000 YDS)
TARGET AREA:	3500000
PHASE TACTICS:	??
----- FIRING DATA -----	
FIRE UNIT:	NAVAL FIRE SUPPORT
TYPE WEAPONS:	Q,M,N,R,P,V
NUMBER TUBES:	??Q,M,N,R,P,V
TYPE AMMO:	??Q,M,N,R,P,V
ROUNDS PER GUN:	??Q,M,N,R,P,V
NUMBER ROUNDS:	239Q,802M,946N,172OR,939P,6944V
FIRE DURATION:	??
----- RESULTS DATA -----	
ATTACK DELAY TIME:	SERIAL LEVEL
TIME TO OBJECTIVE:	SERIAL LEVEL
CASUALTIES:	SERIAL LEVEL
EQUIPMENT DAMAGE:	SERIAL LEVEL
OTHER FACTORS:	SERIAL LEVEL
OTHER RESULTS:	SERIAL LEVEL
SUPPRESSION:	SERIAL LEVEL
----- CALCULATED DATA -----	
RDS/SQ YD:	.0000684Q,.000229M,.00027N,.000491R,.000268P,.00198V
RDS/SQ YD/MIN:	??Q,??M,??N,??R,??P,??V
LBS/SQ YD:	.130Q,.292M,.0692N,.0516R,.014P,.0496V
LBS/SQ YD/MIN:	??Q,??M,??N,??R,??P,??V
LBS/SQ YD (EQ):	.013Q,.038M,.028N,.0258R,.0091P,.0744V
LBS/SQ YD/MIN (EQ):	??Q,??M,??N,??R,??P,??V

## SERIAL

SERIAL: 42  
 REF NUMBER: A32  
 ORIG REF: DOR 44/120  
 REF TITLE: ANALYSIS OF DIFFERENT LANDING OPERATIONS  
 DATA SOURCE: ACTION REPORTS

----- SERIAL DATA -----

SIDE 1 COUNTRY: UK/CANAD  
 SIDE 1 UNITS: ASSAULT FORCE OF 6086 MEN WITH TANKS  
 SIDE 1 POSTURE: ATTACKING  
 SIDE 2 COUNTRY: GERMANY  
 SIDE 2 UNITS: 1700 MEN IN PREP PILLBOXES, MG & ARTY POSITION WITH AERL SPT  
 SIDE 2 POSTURE: DEFENDING

DATE OF ACTION: 08/19/42  
 COUNTRY: FRANCE  
 REGION: DIEPPE  
 TERRAIN: ??  
 WEATHER: ??  
 TIME: 0520

SERIAL TACTICS: LARGE SCALE AMPHIB RAID TO DISRUPT ENEMY, NOT TO CAPTURE AND HOLD DI  
 EPPE. AERIAL SPT WAS PROVIDED  
 NO. BMBRD TARGETS: 1  
 NO. PHASES/TGT: 2

----- TARGET DATA -----

BOMBARD TARGET: TARGET LEVEL

BOMBARD TGT AREA: TARGET LEVEL  
 BOMBARD TACTICS: TARGET LEVEL

----- FIRING DATA -----

FIRE UNIT: PHASE LEVEL  
 TYPE WEAPONS: PHASE LEVEL  
 NUMBER TUBES: PHASE LEVEL  
 TYPE AMMO: PHASE LEVEL  
 ROUNDS PER GUN: PHASE LEVEL  
 NUMBER ROUNDS: PHASE LEVEL  
 FIRE DURATION: TARGET LEVEL AND PHASE LEVEL

----- RESULTS DATA -----

ATTACK DELAY TIME: NONE  
 TIME TO OBJECTIVE: ??  
 CASUALTIES: EST 500 (GERMAN); 80% OF ASSAULT FORCE (UK/CANADA)  
 EQUIPMENT DAMAGE: ?? (GERMAN); 1 DESTR SUNK, 47 LC SUNK/DAMAGED (UK)  
 OTHER FACTORS: UNEXPECTED GERMAN MGS CAUSED MANY CASUALTIES

OTHER RESULTS: BRITISH WITHDRAWAL STARTED AT 1100 AND ENDED AT 1310  
 SUPPRESSION: ATTACKERS GAINED LITTLE OR NO BENEFIT FROM FIRE SUPPORT. GERMAN MORT  
 ARS WERE EFFECTIVE

----- CALCULATED DATA -----

RDS/SQ YD: TARGET LEVEL  
 RDS/SQ YD/MIN: TARGET LEVEL  
 LBS/SQ YD: TARGET LEVEL  
 LBS/SQ YD/MIN: TARGET LEVEL  
 LBS/SQ YD (EQ): TARGET LEVEL  
 LBS/SQ YD/MIN (EQ): TARGET LEVEL

## TARGET

SERIAL:	42
TARGET NUMBER:	1
NUMBER PHASES:	2
TIME:	0520
----- TARGET DATA -----	
TARGET:	ASSAULT BEACH AREA (3000 YDS X 500 YDS)
TARGET AREA:	1500000
TARGET TACTICS:	NAVAL AND AERIAL BOMBARDMENT IN SUPPORT OF AMPHIBIOUS RAID OPERATION S
----- FIRING DATA -----	
FIRE UNIT:	PHASE LEVEL
TYPE WEAPONS:	PHASE LEVEL
NUMBER TUBES:	PHASE LEVEL
TYPE AMMO:	PHASE LEVEL
ROUNDS PER GUN:	PHASE LEVEL
NUMBER ROUNDS:	PHASE LEVEL
FIRE DURATION:	20
----- RESULTS DATA -----	
ATTACK DELAY TIME:	SERIAL LEVEL
TIME TO OBJECTIVE:	SERIAL LEVEL
CASUALTIES:	SERIAL LEVEL
EQUIPMENT DAMAGE:	SERIAL LEVEL
OTHER FACTORS:	SERIAL LEVEL
OTHER RESULTS:	SERIAL LEVEL
SUPPRESSION:	SERIAL LEVEL
----- CALCULATED DATA -----	
RDS/SQ YD:	.000748U/??
RDS/SQ YD/MIN:	??U/??
LBS/SQ YD:	.0269U/??
LBS/SQ YD/MIN:	??U/??
LBS/SQ YD (EQ):	.027U/??
LBS/SQ YD/MIN (EQ):	??U/??

## PHASE

SERIAL:	42
TARGET NUMBER:	1
PHASE NUMBER:	1
TIME:	H-10
----- TARGET DATA -----	
TARGET:	TARGET LEVEL
TARGET AREA:	TARGET LEVEL
PHASE TACTICS:	??
----- FIRING DATA -----	
FIRE UNIT:	NAVAL FIRE SPT/AERIAL BOMBARDMENT
TYPE WEAPONS:	U/??
NUMBER TUBES:	??U/??
TYPE AMMO:	??U/??
ROUNDS PER GUN:	??U/??
NUMBER ROUNDS:	612U/??
FIRE DURATION:	10
----- RESULTS DATA -----	
ATTACK DELAY TIME:	SERIAL LEVEL
TIME TO OBJECTIVE:	SERIAL LEVEL
CASUALTIES:	SERIAL LEVEL
EQUIPMENT DAMAGE:	SERIAL LEVEL
OTHER FACTORS:	SERIAL LEVEL
OTHER RESULTS:	SERIAL LEVEL
SUPPRESSION:	SERIAL LEVEL
----- CALCULATED DATA -----	
RDS/SQ YD:	TARGET LEVEL
RDS/SQ YD/MIN:	TARGET LEVEL
LBS/SQ YD:	TARGET LEVEL
LBS/SQ YD/MIN:	TARGET LEVEL
LBS/SQ YD (EQ):	TARGET LEVEL
LBS/SQ YD/MIN (EQ):	TARGET LEVEL

# PHASE

SERIAL: 42  
TARGET NUMBER: 1  
PHASE NUMBER: 2  
TIME: H

----- TARGET DATA -----

TARGET: TARGET LEVEL  
TARGET AREA: TARGET LEVEL  
PHASE TACTICS: ??

----- FIRING DATA -----

FIRE UNIT: NAVAL FIRE SPT/AERIAL BOMBARDMENT  
TYPE WEAPONS: U/??  
NUMBER TUBES: ??U/??  
TYPE AMMO: ??U/??  
ROUNDS PER GUN: ??U/??  
NUMBER ROUNDS: 510U/??  
FIRE DURATION: 10

----- RESULTS DATA -----

ATTACK DELAY TIME: SERIAL LEVEL  
TIME TO OBJECTIVE: SERIAL LEVEL  
CASUALTIES: SERIAL LEVEL  
EQUIPMENT DAMAGE: SERIAL LEVEL  
OTHER FACTORS: SERIAL LEVEL

OTHER RESULTS: SERIAL LEVEL  
SUPPRESSION: SERIAL LEVEL

----- CALCULATED DATA -----

RDS/SQ YD: TARGET LEVEL  
RDS/SQ YD/MIN: TARGET LEVEL  
LBS/SQ YD: TARGET LEVEL  
LBS/SQ YD/MIN: TARGET LEVEL  
LBS/SQ YD (EQ): TARGET LEVEL  
LBS/SQ YD/MIN (EQ): TARGET LEVEL

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## SERIAL

SERIAL: 43  
 REF NUMBER: A14  
 ORIG REF: 2 ORS 2/5  
 REF TITLE: HEAVY BOMBING IN OPERATION CHARNWOOD  
 DATA SOURCE: ACTION RPTS, AERIAL PHOTOS, GROUND RECCE

----- SERIAL DATA -----

SIDE 1 COUNTRY: BRITAIN  
 SIDE 1 UNITS: BRITISH & CANADIAN TROOPS OF 2ND ARMY  
 SIDE 1 POSTURE: ATTACKING  
 SIDE 2 COUNTRY: GERMANY  
 SIDE 2 UNITS: VARIOUS INFANTRY, ARTY & FLAK UNITS (APPROX 300 MEN)  
 SIDE 2 POSTURE: DEFENDING

DATE OF ACTION: 09/07/44  
 COUNTRY: FRANCE  
 REGION: CAEN  
 TERRAIN: ??  
 WEATHER: ??  
 TIME: ??

SERIAL TACTICS: ATTACK CAEN WITH UK & CANADIAN TROOPS OF 2ND ARMY IN OPERATION CHARNWOOD. SUPPORTED BY AERL BOMBING

NO. BMBRD TARGETS: 2  
 NO. PHASES/TGT: 1/1

----- TARGET DATA -----

BOMBARD TARGET: PHASE LEVEL  
 BOMBARD TGT AREA: PHASE LEVEL  
 BOMBARD TACTICS: TARGET LEVEL

----- FIRING DATA -----

FIRE UNIT: PHASE LEVEL  
 TYPE WEAPONS: PHASE LEVEL  
 NUMBER TUBES: PHASE LEVEL  
 TYPE AMMO: PHASE LEVEL  
 ROUNDS PER GUN: PHASE LEVEL  
 NUMBER ROUNDS: PHASE LEVEL  
 FIRE DURATION: TARGET LEVEL AND PHASE LEVEL

----- RESULTS DATA -----

ATTACK DELAY TIME: TARGET LEVEL  
 TIME TO OBJECTIVE: TARGET LEVEL  
 CASUALTIES: TARGET LEVEL  
 EQUIPMENT DAMAGE: TARGET LEVEL  
 OTHER FACTORS: TARGET LEVEL

OTHER RESULTS: TARGET LEVEL  
 SUPPRESSION: TARGET LEVEL

----- CALCULATED DATA -----

RDS/SQ YD: PHASE LEVEL  
 RDS/SQ YD/MIN: PHASE LEVEL  
 LBS/SQ YD: PHASE LEVEL  
 LBS/SQ YD/MIN: PHASE LEVEL  
 LBS/SQ YD (EQ): PHASE LEVEL  
 LBS/SQ YD/MIN (EQ): PHASE LEVEL

## TARGET

```

SERIAL: 43
TARGET NUMBER: 1
NUMBER PHASES: 1
TIME: ??
----- TARGET DATA -----
TARGET: PHASE LEVEL

TARGET AREA: PHASE LEVEL
TARGET TACTICS: AERIAL BOMBARDMENT BY 300 BOMBERS WITH AIMING POINT OF 01076946

----- FIRING DATA -----
FIRE UNIT: PHASE LEVEL
TYPE WEAPONS: PHASE LEVEL
NUMBER TUBES: PHASE LEVEL
TYPE AMMO: PHASE LEVEL
ROUNDS PER GUN: PHASE LEVEL
NUMBER ROUNDS: PHASE LEVEL
FIRE DURATION: ??

----- RESULTS DATA -----
ATTACK DELAY TIME: ??
TIME TO OBJECTIVE: ??
CASUALTIES: 2 KIA (GERMAN);?? (BRITISH)
EQUIPMENT DAMAGE: SEVERAL GUNS AND VEHICLES (GERMAN);?? (BRITISH)
OTHER FACTORS: CANADIANS DIDN'T OCCUPY TARGET AREA UNTIL 48 HOURS AFTER BOMBING

OTHER RESULTS: GERMANS EVACUATED SERVICEABLE EQUIPMENT BEFORE CANADIANS OCCUPIED TARGET AREA
SUPPRESSION: MATERIEL EFFECTS NOT SUFFICIENT TO ACCOUNT FOR SUCCESS OF THE OPERATION; VALUE WAS IN DISORGANIZING THE ENEMY; LITTLE EVIDENCE OBTAINED ON EFFECT OF BOMBING ON GERMAN MORALE

----- CALCULATED DATA -----
RDS/SQ YD: PHASE LEVEL
RDS/SQ YD/MIN: PHASE LEVEL
LBS/SQ YD: PHASE LEVEL
LBS/SQ YD/MIN: PHASE LEVEL
LBS/SQ YD (EQ): PHASE LEVEL
LBS/SQ YD/MIN (EQ): PHASE LEVEL

```

## PHASE

```

SERIAL: 43
TARGET NUMBER: 1
PHASE NUMBER: 1
TIME: ??
----- TARGET DATA -----
TARGET: GERMAN UNITS IN MEADOWS AND WHEAT FIELDS IN OVAL

TARGET AREA: 844000
PHASE TACTICS: ??

----- FIRING DATA -----
FIRE UNIT: BRITISH BOMBERS
TYPE WEAPONS: AA,EE
NUMBER TUBES: 300 BOMBERS COMBINED
TYPE AMMO: DELAYED FUSE AA, DELAYED FUSE EE
ROUNDS PER GUN: ??AA,??EE
NUMBER ROUNDS: ??AA,??EE
FIRE DURATION: ??

----- RESULTS DATA -----
ATTACK DELAY TIME: TARGET LEVEL
TIME TO OBJECTIVE: TARGET LEVEL
CASUALTIES: TARGET LEVEL
EQUIPMENT DAMAGE: TARGET LEVEL
OTHER FACTORS: TARGET LEVEL

OTHER RESULTS: TARGET LEVEL
SUPPRESSION: TARGET LEVEL

----- CALCULATED DATA -----
RDS/SQ YD: ??AA,??EE
RDS/SQ YD/MIN: ??AA,??EE
LBS/SQ YD: 3.6 COMBINED
LBS/SQ YD/MIN: ??AA,??EE
LBS/SQ YD (EQ): ??AA,??EE
LBS/SQ YD/MIN (EQ): ??AA,??EE

```

## TARGET

SERIAL:	43
TARGET NUMBER:	2
NUMBER PHASES:	1
TIME:	??
----- TARGET DATA -----	
TARGET:	PHASE LEVEL
TARGET AREA:	PHASE LEVEL
TARGET TACTICS:	AERIAL BOMBARDMENT BY 160 BOMBERS WITH AIMING POINT OF 03006944
----- FIRING DATA -----	
FIRE UNIT:	PHASE LEVEL
TYPE WEAPONS:	PHASE LEVEL
NUMBER TUBES:	PHASE LEVEL
TYPE AMMO:	PHASE LEVEL
ROUNDS PER GUN:	PHASE LEVEL
NUMBER ROUNDS:	PHASE LEVEL
FIRE DURATION:	??
----- RESULTS DATA -----	
ATTACK DELAY TIME:	??
TIME TO OBJECTIVE:	??
CASUALTIES:	??;??
EQUIPMENT DAMAGE:	??;??
OTHER FACTORS:	??
OTHER RESULTS:	BOMBING MADE TOWN MORE DIFFICULT TO TAKE BECAUSE RUBBLE DELAYED INFANTRY ADVANCE
SUPPRESSION:	MATERIEL EFFECTS NOT SUFFICIENT TO ACCOUNT FOR SUCCESS OF THE OPERAT ION; VALUE WAS IN DISORGANIZING THE ENEMY; LITTLE EVIDENCE OBTAINED ON EFFECT OF BOMBING ON GERMAN MORALE
----- CALCULATED DATA -----	
RDS/SQ YD:	PHASE LEVEL
RDS/SQ YD/MIN:	PHASE LEVEL
LBS/SQ YD:	PHASE LEVEL
LBS/SQ YD/MIN:	PHASE LEVEL
LBS/SQ YD (EQ):	PHASE LEVEL
LBS/SQ YD/MIN (EQ):	PHASE LEVEL

## PHASE

SERIAL:	43
TARGET NUMBER:	2
PHASE NUMBER:	1
TIME:	??
----- TARGET DATA -----	
TARGET:	URBAN AND SUBURBAN AREA CONTAINING REAR ELEMENTS OF 31 LUFTWAFFE REG T AND 12 SS DIVISION
TARGET AREA:	648000
PHASE TACTICS:	??
----- FIRING DATA -----	
FIRE UNIT:	BRITISH BOMBERS
TYPE WEAPONS:	AA, EE
NUMBER TUBES:	160 BOMBERS COMBINED
TYPE AMMO:	DELAYED FUSE AA, DELAYED FUSE EE
ROUNDS PER GUN:	??AA, ??EE
NUMBER ROUNDS:	??AA, ??EE
FIRE DURATION:	??
----- RESULTS DATA -----	
ATTACK DELAY TIME:	TARGET LEVEL
TIME TO OBJECTIVE:	TARGET LEVEL
CASUALTIES:	TARGET LEVEL
EQUIPMENT DAMAGE:	TARGET LEVEL
OTHER FACTORS:	TARGET LEVEL
OTHER RESULTS:	TARGET LEVEL
SUPPRESSION:	TARGET LEVEL
----- CALCULATED DATA -----	
RDS/SQ YD:	??AA, ??EE
RDS/SQ YD/MIN:	??AA, ??EE
LBS/SQ YD:	2.5 COMBINED
LBS/SQ YD/MIN:	??AA, ??EE
LBS/SQ YD (EQ):	??AA, ??EE
LBS/SQ YD/MIN (EQ):	??AA, ??EE



## SERIAL

SERIAL: 44  
 REF NUMBER: A16  
 ORIG REF: 2 ORS 2/7  
 REF TITLE: BOMBING IN OPERATION BLUECOAT  
 DATA SOURCE: ACTION REPORTS & GROUND RECCE

----- SERIAL DATA -----

SIDE 1 COUNTRY: BRITAIN  
 SIDE 1 UNITS: 15TH SCOTTISH DIVISION  
 SIDE 1 POSTURE: ATTACKING  
 SIDE 2 COUNTRY: GERMANY  
 SIDE 2 UNITS: 326 INF DIV  
 SIDE 2 POSTURE: DEFENDING

DATE OF ACTION: 07/30/44  
 COUNTRY: FRANCE  
 REGION: CAUMONT  
 TERRAIN: ??  
 WEATHER: ??  
 TIME: 0700-1800

SERIAL TACTICS: PHASED DIVISIONAL ATTACK EXPLOITED BY ARMOR AND SUPPORTED BY ARTY AND HEAVY BOMBING

NO. BMBRD TARGETS: 5  
 NO. PHASES/TGT: 1/1/1/1/1

----- TARGET DATA -----

BOMBARD TARGET: PHASE LEVEL  
 BOMBARD TGT AREA: PHASE LEVEL  
 BOMBARD TACTICS: TARGET LEVEL

----- FIRING DATA -----

FIRE UNIT: PHASE LEVEL  
 TYPE WEAPONS: PHASE LEVEL  
 NUMBER TUBES: PHASE LEVEL  
 TYPE AMMO: PHASE LEVEL  
 ROUNDS PER GUN: PHASE LEVEL  
 NUMBER ROUNDS: PHASE LEVEL  
 FIRE DURATION: TARGET LEVEL AND PHASE LEVEL

----- RESULTS DATA -----

ATTACK DELAY TIME: ??  
 TIME TO OBJECTIVE: ??  
 CASUALTIES: ?? (GERMAN); 170 (UK)  
 EQUIPMENT DAMAGE: MTRCYCL COMB & SMALL EQUIP (GERMAN); 50 TANKS (UK)  
 OTHER FACTORS: ARTY SUPPORT WAS NOT REPORTED

OTHER RESULTS: FIERCE FIGHTING ON INITIAL OBJECTIVES DISORGANIZED ENEMY  
 SUPPRESSION: NO EVIDENCE THAT BOMBING WAS DECISIVE; ANY EFFECT MUST HAVE BEEN PSYCHOLOGICAL

----- CALCULATED DATA -----

RDS/SQ YD: PHASE LEVEL  
 RDS/SQ YD/MIN: PHASE LEVEL  
 LBS/SQ YD: PHASE LEVEL  
 LBS/SQ YD/MIN: PHASE LEVEL  
 LBS/SQ YD (EQ): PHASE LEVEL  
 LBS/SQ YD/MIN (EQ): PHASE LEVEL

## TARGET

SERIAL:	44
TARGET NUMBER:	1
NUMBER PHASES:	1
TIME:	0900-1700
----- TARGET DATA -----	
TARGET:	PHASE LEVEL
TARGET AREA:	PHASE LEVEL
TARGET TACTICS:	AERIAL BOMBARDMENT OF SUCCESSIVE AREAS ALONG DIVISIONAL ROUTE OF ADVANCE
----- FIRING DATA -----	
FIRE UNIT:	PHASE LEVEL
TYPE WEAPONS:	PHASE LEVEL
NUMBER TUBES:	PHASE LEVEL
TYPE AMMO:	PHASE LEVEL
ROUNDS PER GUN:	PHASE LEVEL
NUMBER ROUNDS:	PHASE LEVEL
FIRE DURATION:	120
----- RESULTS DATA -----	
ATTACK DELAY TIME:	SERIAL LEVEL
TIME TO OBJECTIVE:	SERIAL LEVEL
CASUALTIES:	SERIAL LEVEL
EQUIPMENT DAMAGE:	SERIAL LEVEL
OTHER FACTORS:	SERIAL LEVEL
OTHER RESULTS:	SERIAL LEVEL
SUPPRESSION:	SERIAL LEVEL
----- CALCULATED DATA -----	
RDS/SQ YD:	PHASE LEVEL
RDS/SQ YD/MIN:	PHASE LEVEL
LBS/SQ YD:	PHASE LEVEL
LBS/SQ YD/MIN:	PHASE LEVEL
LBS/SQ YD (EQ):	PHASE LEVEL
LBS/SQ YD/MIN (EQ):	PHASE LEVEL

## PHASE

SERIAL:	44
TARGET NUMBER:	1
PHASE NUMBER:	1
TIME:	0900-1700
----- TARGET DATA -----	
TARGET:	THREE GERMAN POSITIONS
TARGET AREA:	6800000
PHASE TACTICS:	??
----- FIRING DATA -----	
FIRE UNIT:	BRITISH BOMBERS/ARTILLERY
TYPE WEAPONS:	AA, BB, 250 LB BOMBS/??
NUMBER TUBES:	??AA, ??BB, ??/??
TYPE AMMO:	50% INSTANTANEOUS & 50% DELAYED FUSE AA, BB, 250 LB/??
ROUNDS PER GUN:	??AA, ??BB, ??/??
NUMBER ROUNDS:	468AA, 2419BB, 3597 250 LB BOMBS/??
FIRE DURATION:	120
----- RESULTS DATA -----	
ATTACK DELAY TIME:	SERIAL LEVEL
TIME TO OBJECTIVE:	SERIAL LEVEL
CASUALTIES:	SERIAL LEVEL
EQUIPMENT DAMAGE:	SERIAL LEVEL
OTHER FACTORS:	SERIAL LEVEL
OTHER RESULTS:	SERIAL LEVEL
SUPPRESSION:	SERIAL LEVEL
----- CALCULATED DATA -----	
RDS/SQ YD:	0.000954/??
RDS/SQ YD/MIN:	??/??
LBS/SQ YD:	0.202/??
LBS/SQ YD/MIN:	??/??
LBS/SQ YD (EQ):	0.202/??
LBS/SQ YD/MIN (EQ):	??/??

## TARGET

SERIAL:	44
TARGET NUMBER:	2
NUMBER PHASES:	1
TIME:	0900
----- TARGET DATA -----	
TARGET:	PHASE LEVEL
TARGET AREA:	PHASE LEVEL
TARGET TACTICS:	AERIAL BOMBARDMENT OF AREAS ALONG DIVISIONAL ROUTE OF ADVANCE
----- FIRING DATA -----	
FIRE UNIT:	PHASE LEVEL
TYPE WEAPONS:	PHASE LEVEL
NUMBER TUBES:	PHASE LEVEL
TYPE AMMO:	PHASE LEVEL
ROUNDS PER GUN:	PHASE LEVEL
NUMBER ROUNDS:	PHASE LEVEL
FIRE DURATION:	60
----- RESULTS DATA -----	
ATTACK DELAY TIME:	SERIAL LEVEL
TIME TO OBJECTIVE:	SERIAL LEVEL
CASUALTIES:	SERIAL LEVEL
EQUIPMENT DAMAGE:	SERIAL LEVEL
OTHER FACTORS:	SERIAL LEVEL
OTHER RESULTS:	SERIAL LEVEL
SUPPRESSION:	SERIAL LEVEL
----- CALCULATED DATA -----	
RDS/SQ YD:	PHASE LEVEL
RDS/SQ YD/MIN:	PHASE LEVEL
LBS/SQ YD:	PHASE LEVEL
LBS/SQ YD/MIN:	PHASE LEVEL
LBS/SQ YD (EQ):	PHASE LEVEL
LBS/SQ YD/MIN (EQ):	PHASE LEVEL

## PHASE

SERIAL:	44
TARGET NUMBER:	2
PHASE NUMBER:	1
TIME:	0900
----- TARGET DATA -----	
TARGET:	GERMAN POSITION
TARGET AREA:	1000000
PHASE TACTICS:	??
----- FIRING DATA -----	
FIRE UNIT:	BRITISH BOMBERS/ .JTY
TYPE WEAPONS:	AA/??
NUMBER TUBES:	??AA/??
TYPE AMMO:	INSTANTANEOUS FUSE AA/??
ROUNDS PER GUN:	??AA/??
NUMBER ROUNDS:	1346AA/??
FIRE DURATION:	60
----- RESULTS DATA -----	
ATTACK DELAY TIME:	SERIAL LEVEL
TIME TO OBJECTIVE:	SERIAL LEVEL
CASUALTIES:	SERIAL LEVEL
EQUIPMENT DAMAGE:	SERIAL LEVEL
OTHER FACTORS:	SERIAL LEVEL
OTHER RESULTS:	SERIAL LEVEL
SUPPRESSION:	SERIAL LEVEL
----- CALCULATED DATA -----	
RDS/SQ YD:	0.00135AA/??
RDS/SQ YD/MIN:	??AA/??
LBS/SQ YD:	0.873AA/??
LBS/SQ YD/MIN:	??AA/??
LBS/SQ YD (EQ):	0.873AA/??
LBS/SQ YD/MIN (EQ):	??AA/??

## TARGET

SERIAL:	44
TARGET NUMBER:	3
NUMBER PHASES:	1
TIME:	0900
----- TARGET DATA -----	
TARGET:	PHASE LEVEL
TARGET AREA:	PHASE LEVEL
TARGET TACTICS:	AERIAL BOMBARDMENT OF AREAS ALONG DIVISIONAL ROUTE OF ADVANCE
----- FIRING DATA -----	
FIRE UNIT:	PHASE LEVEL
TYPE WEAPONS:	PHASE LEVEL
NUMBER TUBES:	PHASE LEVEL
TYPE AMMO:	PHASE LEVEL
ROUNDS PER GUN:	PHASE LEVEL
NUMBER ROUNDS:	PHASE LEVEL
FIRE DURATION:	60
----- RESULTS DATA -----	
ATTACK DELAY TIME:	SERIAL LEVEL
TIME TO OBJECTIVE:	SERIAL LEVEL
CASUALTIES:	SERIAL LEVEL
EQUIPMENT DAMAGE:	SERIAL LEVEL
OTHER FACTORS:	SERIAL LEVEL
OTHER RESULTS:	SERIAL LEVEL
SUPPRESSION:	SERIAL LEVEL
----- CALCULATED DATA -----	
RDS/SQ YD:	PHASE LEVEL
RDS/SQ YD/MIN:	PHASE LEVEL
LBS/SQ YD:	PHASE LEVEL
LBS/SQ YD/MIN:	PHASE LEVEL
LBS/SQ YD (EQ):	PHASE LEVEL
LBS/SQ YD/MIN (EQ):	PHASE LEVEL

## PHASE

SERIAL:	44
TARGET NUMBER:	3
PHASE NUMBER:	1
TIME:	0900
----- TARGET DATA -----	
TARGET:	GERMAN POSITION
TARGET AREA:	1000000
PHASE TACTICS:	??
----- FIRING DATA -----	
FIRE UNIT:	BRITISH BOMBERS/ARTY
TYPE WEAPONS:	AA/??
NUMBER TUBES:	??AA/??
TYPE AMMO:	INSTANTANEOUS FUSE AA/??
ROUNDS PER GUN:	??AA/??
NUMBER ROUNDS:	1327AA/??
FIRE DURATION:	60
----- RESULTS DATA -----	
ATTACK DELAY TIME:	SERIAL LEVEL
TIME TO OBJECTIVE:	SERIAL LEVEL
CASUALTIES:	SERIAL LEVEL
EQUIPMENT DAMAGE:	SERIAL LEVEL
OTHER FACTORS:	SERIAL LEVEL
OTHER RESULTS:	SERIAL LEVEL
SUPPRESSION:	SERIAL LEVEL
----- CALCULATED DATA -----	
RDS/SQ YD:	0.00133AA/??
RDS/SQ YD/MIN:	??AA/??
LBS/SQ YD:	0.664AA/??
LBS/SQ YD/MIN:	??AA/??
LBS/SQ YD (EQ):	0.664AA/??
LBS/SQ YD/MIN (EQ):	??AA/??

## TARGET

SERIAL:	44
TARGET NUMBER:	4
NUMBER PHASES:	1
TIME:	0900
----- TARGET DATA -----	
TARGET:	PHASE LEVEL
TARGET AREA:	PHASE LEVEL
TARGET TACTICS:	AERIAL BOMBARDMENT OF AREAS ALONG DIVISIONAL ROUTE OF ADVANCE
----- FIRING DATA -----	
FIRE UNIT:	PHASE LEVEL
TYPE WEAPONS:	PHASE LEVEL
NUMBER TUBES:	PHASE LEVEL
TYPE AMMO:	PHASE LEVEL
ROUNDS PER GUN:	PHASE LEVEL
NUMBER ROUNDS:	PHASE LEVEL
FIRE DURATION:	60
----- RESULTS DATA -----	
ATTACK DELAY TIME:	SERIAL LEVEL
TIME TO OBJECTIVE:	SERIAL LEVEL
CASUALTIES:	SERIAL LEVEL
EQUIPMENT DAMAGE:	SERIAL LEVEL
OTHER FACTORS:	SERIAL LEVEL
OTHER RESULTS:	SERIAL LEVEL
SUPPRESSION:	SERIAL LEVEL
----- CALCULATED DATA -----	
RDS/SQ YD:	PHASE LEVEL
RDS/SQ YD/MIN:	PHASE LEVEL
LBS/SQ YD:	PHASE LEVEL
LBS/SQ YD/MIN:	PHASE LEVEL
LBS/SQ YD (EQ):	PHASE LEVEL
LBS/SQ YD/MIN (EQ):	PHASE LEVEL

## PHASE

SERIAL:	44
TARGET NUMBER:	4
PHASE NUMBER:	1
TIME:	0900
----- TARGET DATA -----	
TARGET:	GERMAN POSITION
TARGET AREA:	1000000
PHASE TACTICS:	??
----- FIRING DATA -----	
FIRE UNIT:	BRITISH BOMBERS/ARTY
TYPE WEAPONS:	AA/??
NUMBER TUBES:	??AA/??
TYPE AMMO:	30% INSTANTANEOUS, 70% DELAYED FUSE AA/??
ROUNDS PER GUN:	??AA/??
NUMBER ROUNDS:	3277AA/??
FIRE DURATION:	60
----- RESULTS DATA -----	
ATTACK DELAY TIME:	SERIAL LEVEL
TIME TO OBJECTIVE:	SERIAL LEVEL
CASUALTIES:	SERIAL LEVEL
EQUIPMENT DAMAGE:	SERIAL LEVEL
OTHER FACTORS:	SERIAL LEVEL
OTHER RESULTS:	SERIAL LEVEL
SUPPRESSION:	SERIAL LEVEL
----- CALCULATED DATA -----	
RDS/SQ YD:	0.00328AA/??
RDS/SQ YD/MIN:	??AA/??
LBS/SQ YD:	1.634AA/??
LBS/SQ YD/MIN:	??AA/??
LBS/SQ YD (EQ):	1.634AA/??
LBS/SQ YD/MIN (EQ):	??AA/??

## TARGET

SERIAL:	44
TARGET NUMBER:	5
NUMBER PHASES:	1
TIME:	0900
----- TARGET DATA -----	
TARGET:	PHASE LEVEL
TARGET AREA:	PHASE LEVEL
TARGET TACTICS:	AERIAL BOMBARDMENT OF AREAS ALONG DIVISIONAL ROUTE OF ADVANCE
----- FIRING DATA -----	
FIRE UNIT:	PHASE LEVEL
TYPE WEAPONS:	PHASE LEVEL
NUMBER TUBES:	PHASE LEVEL
TYPE AMMO:	PHASE LEVEL
ROUNDS PER GUN:	PHASE LEVEL
NUMBER ROUNDS:	PHASE LEVEL
FIRE DURATION:	60
----- RESULTS DATA -----	
ATTACK DELAY TIME:	SERIAL LEVEL
TIME TO OBJECTIVE:	SERIAL LEVEL
CASUALTIES:	SERIAL LEVEL
EQUIPMENT DAMAGE:	SERIAL LEVEL
OTHER FACTORS:	SERIAL LEVEL
OTHER RESULTS:	SERIAL LEVEL
SUPPRESSION:	SERIAL LEVEL
----- CALCULATED DATA -----	
RDS/SQ YD:	PHASE LEVEL
RDS/SQ YD/MIN:	PHASE LEVEL
LBS/SQ YD:	PHASE LEVEL
LBS/SQ YD/MIN:	PHASE LEVEL
LBS/SQ YD (EQ):	PHASE LEVEL
LBS/SQ YD/MIN (EQ):	PHASE LEVEL

## PHASE

SERIAL:	44
TARGET NUMBER:	5
PHASE NUMBER:	1
TIME:	0900
----- TARGET DATA -----	
TARGET:	GERMAN POSITION
TARGET AREA:	1000000
PHASE TACTICS:	??
----- FIRING DATA -----	
FIRE UNIT:	BRITISH BOMBERS/ARTY
TYPE WEAPONS:	AA/??
NUMBER TUBES:	??AA/??
TYPE AMMO:	??AA/??
ROUNDS PER GUN:	??AA/??
NUMBER ROUNDS:	124AA/??
FIRE DURATION:	60
----- RESULTS DATA -----	
ATTACK DELAY TIME:	SERIAL LEVEL
TIME TO OBJECTIVE:	SERIAL LEVEL
CASUALTIES:	SERIAL LEVEL
EQUIPMENT DAMAGE:	SERIAL LEVEL
OTHER FACTORS:	SERIAL LEVEL
OTHER RESULTS:	SERIAL LEVEL
SUPPRESSION:	SERIAL LEVEL
----- CALCULATED DATA -----	
RDS/SQ YD:	0.000124AA/??
RDS/SQ YD/MIN:	??AA/??
LBS/SQ YD:	0.002AA/??
LBS/SQ YD/MIN:	??AA/??
LBS/SQ YD (EQ):	0.002AA/??
LBS/SQ YD/MIN (EQ):	??AA/??

## SERIAL

SERIAL: 45  
REF NUMBER: A17 AND A18  
ORIG REF: 2 ORS 2/8 AND 2/14  
REF TITLE: OPERATION TOTALISE AND HEAVY BOMBING IN SPT OF THE ARMY  
DATA SOURCE: ACTION REPORTS PLUS GROUND RECCE

----- SERIAL DATA -----  
SIDE 1 COUNTRY: UK,CANAD  
SIDE 1 UNITS: 2ND CDN DIV AND BRITISH AIR UNITS  
SIDE 1 POSTURE: ATTACKING  
SIDE 2 COUNTRY: GERMANY  
SIDE 2 UNITS: MISC INFANTRY AND ARMOR  
SIDE 2 POSTURE: DEFENDING

DATE OF ACTION: 08/07/44  
COUNTRY: FRANCE  
REGION: CAEN/FALAISE  
TERRAIN: ??  
WEATHER: ??  
TIME: 2330

SERIAL TACTICS: DIVISIONAL ATTACK WITH ARMOR SUPPORT,AERIAL AND ARTY BOMBARDMENT

NO. BMBRD TARGETS: 6  
NO. PHASES/TGT: 1/1/1/1/1/1

----- TARGET DATA -----  
BOMBARD TARGET: PHASE LEVEL  
BOMBARD TGT AREA: PHASE LEVEL  
BOMBARD TACTICS: TARGET LEVEL

----- FIRING DATA -----  
FIRE UNIT: PHASE LEVEL  
TYPE WEAPONS: PHASE LEVEL  
NUMBER TUBES: PHASE LEVEL  
TYPE AMMO: PHASE LEVEL  
ROUNDS PER GUN: PHASE LEVEL  
NUMBER ROUNDS: PHASE LEVEL  
FIRE DURATION: TARGET LEVEL AND PHASE LEVEL

----- RESULTS DATA -----  
ATTACK DELAY TIME: TARGET LEVEL  
TIME TO OBJECTIVE: TARGET LEVEL  
CASUALTIES: TARGET LEVEL  
EQUIPMENT DAMAGE: TARGET LEVEL  
OTHER FACTORS: TARGET LEVEL

OTHER RESULTS: TARGET LEVEL  
SUPPRESSION: TARGET LEVEL

----- CALCULATED DATA -----  
RDS/SQ YD: PHASE LEVEL  
RDS/SQ YD/MIN: PHASE LEVEL  
LBS/SQ YD: PHASE LEVEL  
LBS/SQ YD/MIN: PHASE LEVEL  
LBS/SQ YD (EQ): PHASE LEVEL  
LBS/SQ YD/MIN (EQ): PHASE LEVEL

## TARGET

SERIAL:	45
TARGET NUMBER:	1
NUMBER PHASES:	1
TIME:	2400
----- TARGET DATA -----	
TARGET:	PHASE LEVEL
TARGET AREA:	PHASE LEVEL
TARGET TACTICS:	AERIAL BOMBING FOLLOWED BY GROUND ATTACK. NO ARTY SUPPORT WAS PLANNED OR EXECUTED.
----- FIRING DATA -----	
FIRE UNIT:	PHASE LEVEL
TYPE WEAPONS:	PHASE LEVEL
NUMBER TUBES:	PHASE LEVEL
TYPE AMMO:	PHASE LEVEL
ROUNDS PER GUN:	PHASE LEVEL
NUMBER ROUNDS:	PHASE LEVEL
FIRE DURATION:	??
----- RESULTS DATA -----	
ATTACK DELAY TIME:	1 HOUR
TIME TO OBJECTIVE:	1 HOUR
CASUALTIES:	?? (GERMAN):110 (CON)
EQUIPMENT DAMAGE:	?:??
OTHER FACTORS:	GERMAN TANKS AND MOTOR TRANSPORT PULLED OUT OF VILLAGE WHEN NEIGHBORING VILLAGE WAS BOMBED
OTHER RESULTS:	GERMANS PUT UP STIFF RESISTANCE
SUPPRESSION:	BOMBING DID NOT ASSIST IN THE TAKING OF FONTENAY BECAUSE BOMBS MISSED TARGET
----- CALCULATED DATA -----	
RDS/SQ YD:	PHASE LEVEL
RDS/SQ YD/MIN:	PHASE LEVEL
LBS/SQ YD:	PHASE LEVEL
LBS/SQ YD/MIN:	PHASE LEVEL
LBS/SQ YD (EQ):	PHASE LEVEL
LBS/SQ YD/MIN (EQ):	PHASE LEVEL

## PHASE

SERIAL:	45
TARGET NUMBER:	1
PHASE NUMBER:	1
TIME:	2400
----- TARGET DATA -----	
TARGET:	FONTENAY LE MARMION
TARGET AREA:	??
PHASE TACTICS:	??
----- FIRING DATA -----	
FIRE UNIT:	BRITISH BOMBERS
TYPE WEAPONS:	AA,EE
NUMBER TUBES:	135 BOMBERS
TYPE AMMO:	DELAYED FUSE AA,DELAYED FUSE EE
ROUNDS PER GUN:	??AA,??EE
NUMBER ROUNDS:	519AA,1597EE
FIRE DURATION:	??
----- RESULTS DATA -----	
ATTACK DELAY TIME:	TARGET LEVEL
TIME TO OBJECTIVE:	TARGET LEVEL
CASUALTIES:	TARGET LEVEL
EQUIPMENT DAMAGE:	TARGET LEVEL
OTHER FACTORS:	TARGET LEVEL
OTHER RESULTS:	TARGET LEVEL
SUPPRESSION:	TARGET LEVEL
----- CALCULATED DATA -----	
RDS/SQ YD:	??AA,??EE
RDS/SQ YD/MIN:	??AA,??EE
LBS/SQ YD:	??AA,??EE
LBS/SQ YD/MIN:	??AA,??EE
LBS/SQ YD (EQ):	ALMOST ZERO, MOST BOMBS MISSED TARGET
LBS/SQ YD/MIN (EQ):	??AA,??EE

## TARGET

SERIAL:	45
TARGET NUMBER:	2
NUMBER PHASES:	1
TIME:	??
----- TARGET DATA -----	
TARGET:	PHASE LEVEL
TARGET AREA:	PHASE LEVEL
TARGET TACTICS:	AERIAL BOMBING, NO ARTY SPT, NO ATTACK PLANNED
----- FIRING DATA -----	
FIRE UNIT:	PHASE LEVEL
TYPE WEAPONS:	PHASE LEVEL
NUMBER TUBES:	PHASE LEVEL
TYPE AMMO:	PHASE LEVEL
ROUNDS PER GUN:	PHASE LEVEL
NUMBER ROUNDS:	PHASE LEVEL
FIRE DURATION:	??
----- RESULTS DATA -----	
ATTACK DELAY TIME:	N/A
TIME TO OBJECTIVE:	N/A
CASUALTIES:	??;??
EQUIPMENT DAMAGE:	TOWN'S BUILDINGS DESTROYED (GERMAN);?? (BRITISH)
OTHER FACTORS:	LA HOGUE NOT OCCUPIED AT TIME OF BOMBING. GERMANS OCCUPIED IT BETWEE N 7 AND 9 AUGUST
OTHER RESULTS:	LA HOGUE BYPASSED ON 9 AUGUST
SUPPRESSION:	??
----- CALCULATED DATA -----	
RDS/SQ YD:	PHASE LEVEL
RDS/SQ YD/MIN:	PHASE LEVEL
LBS/SQ YD:	PHASE LEVEL
LBS/SQ YD/MIN:	PHASE LEVEL
LBS/SQ YD (EQ):	PHASE LEVEL
LBS/SQ YD/MIN (EQ):	PHASE LEVEL

## PHASE

SERIAL:	45
TARGET NUMBER:	2
PHASE NUMBER:	1
TIME:	??
----- TARGET DATA -----	
TARGET:	LA HOGUE
TARGET AREA:	??
PHASE TACTICS:	??
----- FIRING DATA -----	
FIRE UNIT:	BRITISH BOMBERS
TYPE WEAPONS:	AA,EE
NUMBER TUBES:	99 BOMBERS
TYPE AMMO:	DELAYED FUSE AA, DELAYED FUSE EE
ROUNDS PER GUN:	??AA, ??EE
NUMBER ROUNDS:	379AA, 858EE
FIRE DURATION:	??
----- RESULTS DATA -----	
ATTACK DELAY TIME:	TARGET LEVEL
TIME TO OBJECTIVE:	TARGET LEVEL
CASUALTIES:	TARGET LEVEL
EQUIPMENT DAMAGE:	TARGET LEVEL
OTHER FACTORS:	TARGET LEVEL
OTHER RESULTS:	TARGET LEVEL
SUPPRESSION:	TARGET LEVEL
----- CALCULATED DATA -----	
RDS/SQ YD:	??AA, ??EE
RDS/SQ YD/MIN:	??AA, ??EE
LBS/SQ YD:	??AA, ??EE
LBS/SQ YD/MIN:	??AA, ??EE
LBS/SQ YD (EQ):	??AA, ??EE
LBS/SQ YD/MIN (EQ):	??AA, ??EE

## TARGET

SERIAL:	45
TARGET NUMBER:	3
NUMBER PHASES:	1
TIME:	??
----- TARGET DATA -----	
TARGET:	PHASE LEVEL
TARGET AREA:	PHASE LEVEL
TARGET TACTICS:	AERIAL BOMBING FOLLOWED BY GROUND ATTACK. NO ARTY SPT PLANNED OR EXECUTED
----- FIRING DATA -----	
FIRE UNIT:	PHASE LEVEL
TYPE WEAPONS:	PHASE LEVEL
NUMBER TUBES:	PHASE LEVEL
TYPE AMMO:	PHASE LEVEL
ROUNDS PER GUN:	PHASE LEVEL
NUMBER ROUNDS:	PHASE LEVEL
FIRE DURATION:	??
----- RESULTS DATA -----	
ATTACK DELAY TIME:	NONE
TIME TO OBJECTIVE:	??
CASUALTIES:	?? (GERMAN); 48 (CANADIAN)
EQUIPMENT DAMAGE:	??; ??
OTHER FACTORS:	BOMBING ALMOST ENTIRELY MISSED TARGET
OTHER RESULTS:	ATTACKERS STOPPED BY MG FIRE, RESUMED ADVANCE NEXT DAY
SUPPRESSION:	BOMBING DID NOT ASSIST IN THE TAKING OF MAY SUR ORNE, BECAUSE BOMBS MISSED THE TARGET
----- CALCULATED DATA -----	
RDS/SQ YD:	PHASE LEVEL
RDS/SQ YD/MIN:	PHASE LEVEL
LBS/SQ YD:	PHASE LEVEL
LBS/SQ YD/MIN:	PHASE LEVEL
LBS/SQ YD (EQ):	PHASE LEVEL
LBS/SQ YD/MIN (EQ):	PHASE LEVEL

## PHASE

SERIAL:	45
TARGET NUMBER:	3
PHASE NUMBER:	1
TIME:	??
----- TARGET DATA -----	
TARGET:	MAY SUR ORNE
TARGET AREA:	??
PHASE TACTICS:	??
----- FIRING DATA -----	
FIRE UNIT:	BRITISH BOMBERS
TYPE WEAPONS:	AA, EE
NUMBER TUBES:	92 BOMBERS
TYPE AMMO:	DELAYED FUSE AA, DELAYED FUSE EE
ROUNDS PER GUN:	??AA, ??EE
NUMBER ROUNDS:	321AA, 791EE
FIRE DURATION:	??
----- RESULTS DATA -----	
ATTACK DELAY TIME:	TARGET LEVEL
TIME TO OBJECTIVE:	TARGET LEVEL
CASUALTIES:	TARGET LEVEL
EQUIPMENT DAMAGE:	TARGET LEVEL
OTHER FACTORS:	TARGET LEVEL
OTHER RESULTS:	TARGET LEVEL
SUPPRESSION:	TARGET LEVEL
----- CALCULATED DATA -----	
RDS/SQ YD:	??AA, ??EE
RDS/SQ YD/MIN:	??AA, ??EE
LBS/SQ YD:	??AA, ??EE
LBS/SQ YD/MIN:	??AA, ??EE
LBS/SQ YD (EQ):	ALMOST ZERO - MOST BOMBS MISSED TARGET
LBS/SQ YD/MIN (EQ):	??AA, ??EE

## TARGET

SERIAL:	45
TARGET NUMBER:	4
NUMBER PHASES:	1
TIME:	??
----- TARGET DATA -----	
TARGET:	PHASE LEVEL
TARGET AREA:	PHASE LEVEL
TARGET TACTICS:	AERIAL BOMBING, NO ARTY SPT AND NO ATTACK PLANNED
----- FIRING DATA -----	
FIRE UNIT:	PHASE LEVEL
TYPE WEAPONS:	PHASE LEVEL
NUMBER TUBES:	PHASE LEVEL
TYPE AMMO:	PHASE LEVEL
ROUNDS PER GUN:	PHASE LEVEL
NUMBER ROUNDS:	PHASE LEVEL
FIRE DURATION:	??
----- RESULTS DATA -----	
ATTACK DELAY TIME:	N/A
TIME TO OBJECTIVE:	N/A
CASUALTIES:	N/A
EQUIPMENT DAMAGE:	N/A
OTHER FACTORS:	UNOCCUPIED AT TIME OF BOMBING AND NOT ATTACKED
OTHER RESULTS:	N/A
SUPPRESSION:	N/A
----- CALCULATED DATA -----	
RDS/SQ YD:	PHASE LEVEL
RDS/SQ YD/MIN:	PHASE LEVEL
LBS/SQ YD:	PHASE LEVEL
LBS/SQ YD/MIN:	PHASE LEVEL
LBS/SQ YD (EQ):	PHASE LEVEL
LBS/SQ YD/MIN (EQ):	PHASE LEVEL

## PHASE

SERIAL:	45
TARGET NUMBER:	4
PHASE NUMBER:	1
TIME:	??
----- TARGET DATA -----	
TARGET:	SECQUEVILLE LA CAMPAGNE
TARGET AREA:	??
PHASE TACTICS:	??
----- FIRING DATA -----	
FIRE UNIT:	BRITISH BOMBERS
TYPE WEAPONS:	AA,EE
NUMBER TUBES:	110 BOMBERS
TYPE AMMO:	DELAYED FUSE AA, DELAYED FUSE EE
ROUNDS PER GUN:	??AA, ??EE
NUMBER ROUNDS:	492AA, 1102EE
FIRE DURATION:	??
----- RESULTS DATA -----	
ATTACK DELAY TIME:	TARGET LEVEL
TIME TO OBJECTIVE:	TARGET LEVEL
CASUALTIES:	TARGET LEVEL
EQUIPMENT DAMAGE:	TARGET LEVEL
OTHER FACTORS:	TARGET LEVEL
OTHER RESULTS:	TARGET LEVEL
SUPPRESSION:	TARGET LEVEL
----- CALCULATED DATA -----	
RDS/SQ YD:	??AA, ??EE
RDS/SQ YD/MIN:	??AA, ??EE
LBS/SQ YD:	??AA, ??EE
LBS/SQ YD/MIN:	??AA, ??EE
LBS/SQ YD (EQ):	??AA, ??EE
LBS/SQ YD/MIN (EQ):	??AA, ??EE

## TARGET

```

SERIAL:          45
TARGET NUMBER:   5
NUMBER PHASES:   1
TIME:            ??
----- TARGET DATA -----
TARGET:          PHASE LEVEL

TARGET AREA:     PHASE LEVEL
TARGET TACTICS:  AERIAL BOMBING, NO ARTY SUPPORT AND NO ATTACK PLANNED

----- FIRING DATA -----
FIRE UNIT:       PHASE LEVEL
TYPE WEAPONS:    PHASE LEVEL
NUMBER TUBES:    PHASE LEVEL
TYPE AMMO:       PHASE LEVEL
ROUNDS PER GUN:  PHASE LEVEL
NUMBER ROUNDS:   PHASE LEVEL
FIRE DURATION:   ??

----- RESULTS DATA -----
ATTACK DELAY TIME: N/A
TIME TO OBJECTIVE: N/A
CASUALTIES:        N/A
EQUIPMENT DAMAGE:  N/A
OTHER FACTORS:     ATTACK NEITHER PLANNED NOR EXECUTED

OTHER RESULTS:    N/A
SUPPRESSION:      N/A

----- CALCULATED DATA -----
RDS/SQ YD:        PHASE LEVEL
RDS/SQ YD/MIN:    PHASE LEVEL
LBS/SQ YD:        PHASE LEVEL
LBS/SQ YD/MIN:    PHASE LEVEL
LBS/SQ YD (EQ):   PHASE LEVEL
LBS/SQ YD/MIN (EQ): PHASE LEVEL
  
```

## PHASE

```

SERIAL:          45
TARGET NUMBER:   5
PHASE NUMBER:    1
TIME:            ??
----- TARGET DATA -----
TARGET:          TRACK CROSSING AT 103593

TARGET AREA:     ??
PHASE TACTICS:   ??

----- FIRING DATA -----
FIRE UNIT:       BRITISH BOMBERS
TYPE WEAPONS:    AA, EE
NUMBER TUBES:    205 BOMBERS
TYPE AMMO:       DELAYED FUSE AA, DELAYED FUSE EE
ROUNDS PER GUN:  ??AA, ??EE
NUMBER ROUNDS:   747AA, 2101EE
FIRE DURATION:   ??

----- RESULTS DATA -----
ATTACK DELAY TIME: TARGET LEVEL
TIME TO OBJECTIVE: TARGET LEVEL
CASUALTIES:        TARGET LEVEL
EQUIPMENT DAMAGE:  TARGET LEVEL
OTHER FACTORS:     TARGET LEVEL

OTHER RESULTS:    TARGET LEVEL
SUPPRESSION:      TARGET LEVEL

----- CALCULATED DATA -----
RDS/SQ YD:        ??AA, ??EE
RDS/SQ YD/MIN:    ??AA, ??EE
LBS/SQ YD:        ??AA, ??EE
LBS/SQ YD/MIN:    ??AA, ??EE
LBS/SQ YD (EQ):   ??AA, ??EE
LBS/SQ YD/MIN (EQ): ??AA, ??EE
  
```

## TARGET

SERIAL:	45
TARGET NUMBER:	6
NUMBER PHASES:	1
TIME:	2345
----- TARGET DATA -----	
TARGET:	PHASE LEVEL
TARGET AREA:	PHASE LEVEL
TARGET TACTICS:	ARTY BOMBARDMENT FOLLOWED BY GROUND ATTACK
----- FIRING DATA -----	
FIRE UNIT:	PHASE LEVEL
TYPE WEAPONS:	PHASE LEVEL
NUMBER TUBES:	PHASE LEVEL
TYPE AMMO:	PHASE LEVEL
ROUNDS PER GUN:	PHASE LEVEL
NUMBER ROUNDS:	PHASE LEVEL
FIRE DURATION:	62
----- RESULTS DATA -----	
ATTACK DELAY TIME:	NONE
TIME TO OBJECTIVE:	2 HOURS
CASUALTIES:	40 POW (GERMAN); 41 (CANADIAN)
EQUIPMENT DAMAGE:	1 X 88MM DESTROYED (GERMAN); ?? (CANADIAN)
OTHER FACTORS:	??
OTHER RESULTS:	??
SUPPRESSION:	??
----- CALCULATED DATA -----	
RDS/SQ YD:	PHASE LEVEL
RDS/SQ YD/MIN:	PHASE LEVEL
LBS/SQ YD:	PHASE LEVEL
LBS/SQ YD/MIN:	PHASE LEVEL
LBS/SQ YD (EQ):	PHASE LEVEL
LBS/SQ YD/MIN (EQ):	PHASE LEVEL

## PHASE

SERIAL:	45
TARGET NUMBER:	6
PHASE NUMBER:	1
TIME:	2345
----- TARGET DATA -----	
TARGET:	ROCQUAMCOURT
TARGET AREA:	BETWEEN 1000000 AND 4000000
PHASE TACTICS:	??
----- FIRING DATA -----	
FIRE UNIT:	1 CON FD REGT
TYPE WEAPONS:	A
NUMBER TUBES:	36A
TYPE AMMO:	??A
ROUNDS PER GUN:	??A
NUMBER ROUNDS:	7500A
FIRE DURATION:	62
----- RESULTS DATA -----	
ATTACK DELAY TIME:	TARGET LEVEL
TIME TO OBJECTIVE:	TARGET LEVEL
CASUALTIES:	TARGET LEVEL
EQUIPMENT DAMAGE:	TARGET LEVEL
OTHER FACTORS:	TARGET LEVEL
OTHER RESULTS:	TARGET LEVEL
SUPPRESSION:	TARGET LEVEL
----- CALCULATED DATA -----	
RDS/SQ YD:	BETWEEN .0075 AND .00188A
RDS/SQ YD/MIN:	??A
LBS/SQ YD:	BETWEEN .188 AND .0469A
LBS/SQ YD/MIN:	??A
LBS/SQ YD (EQ):	BETWEEN .188 AND .0469A
LBS/SQ YD/MIN (EQ):	??A



## SERIAL

SERIAL: 46  
 REF NUMBER: A21  
 ORIG REF: 2 ORS MEMORANDUM 2  
 REF TITLE: BOMBING OF COMMUNICATIONS CENTERS PRIOR TO OPERATION PLUNDER  
 DATA SOURCE: OPERTL RECORDS, INTERVIEWS, GROUND RECCE

----- SERIAL DATA -----

SIDE 1 COUNTRY: BRITAIN  
 SIDE 1 UNITS: VARIOUS BOMBER COMMANDS  
 SIDE 1 POSTURE: ATTACKING  
 SIDE 2 COUNTRY: GERMANY  
 SIDE 2 UNITS: TOWNS, COMMUNICATIONS AND TRANSPORTATION CENTERS  
 SIDE 2 POSTURE: PASSIVE

DATE OF ACTION: 03/21/45 TO 03/23/45  
 COUNTRY: GERMANY  
 REGION: BOCHOLT  
 TERRAIN: ??  
 WEATHER: ??  
 TIME: ??

SERIAL TACTICS: BOMBING CAMPAIGN TO CUT GERMAN COMMUNICATIONS AND DISRUPT ROAD AND RAILWAY TRANSPORTATION

NO. BMBRD TARGETS: 1  
 NO. PHASES/TGT: 1 (LASTING 3 DAYS)

----- TARGET DATA -----

BOMBARD TARGET: PHASE LEVEL

BOMBARD TGT AREA: PHASE LEVEL  
 BOMBARD TACTICS: TARGET LEVEL

----- FIRING DATA -----

FIRE UNIT: PHASE LEVEL  
 TYPE WEAPONS: PHASE LEVEL  
 NUMBER TUBES: PHASE LEVEL  
 TYPE AMMO: PHASE LEVEL  
 ROUNDS PER GUN: PHASE LEVEL  
 NUMBER ROUNDS: PHASE LEVEL  
 FIRE DURATION: TARGET LEVEL AND PHASE LEVEL

----- RESULTS DATA -----

ATTACK DELAY TIME: SEVERAL WEEKS  
 TIME TO OBJECTIVE: ??  
 CASUALTIES: 1925 CIVILIANS AND 49 SOLDIERS (GERMAN); ?? (BRITISH)  
 EQUIPMENT DAMAGE: PHONES, RAIL USELESS, RDS BLOCKED (GERMAN); ?? (UK)  
 OTHER FACTORS: RELIANCE OF GERMANS ON HORSES & LACK OF MOTOR TRANSP MADE DESTR OF RDS & RAILS RELATIVELY UNIMPORTANT  
 OTHER RESULTS: GERMANS RESISTED SUBSEQUENT ALLIED OFFENSE STIFFLY  
 SUPPRESSION: MORALE OF GERMAN CIVILIANS AND MILITARY GREATLY LOWERED BUT NO DEFINITE EVIDENCE COULD BE FOUND OF MORALE EFFECTS

----- CALCULATED DATA -----

RDS/SQ YD: PHASE LEVEL  
 RDS/SQ YD/MIN: PHASE LEVEL  
 LBS/SQ YD: PHASE LEVEL  
 LBS/SQ YD/MIN: PHASE LEVEL  
 LBS/SQ YD (EQ): PHASE LEVEL  
 LBS/SQ YD/MIN (EQ): PHASE LEVEL

## TARGET

```

SERIAL: 46
TARGET NUMBER: 1
NUMBER PHASES: 1
TIME: ??
----- TARGET DATA -----
TARGET: PHASE LEVEL

TARGET AREA: PHASE LEVEL
TARGET TACTICS: DAILY BOMBING ATTACKS TO CUT COMMUNICATIONS AND DISRUPT ROAD AND RAILWAY TRANSPORTATION
----- FIRING DATA -----
FIRE UNIT: PHASE LEVEL
TYPE WEAPONS: PHASE LEVEL
NUMBER TUBES: PHASE LEVEL
TYPE AMMO: PHASE LEVEL
ROUNDS PER GUN: PHASE LEVEL
NUMBER ROUNDS: PHASE LEVEL
FIRE DURATION: 3 DAYS (PERIODIC)
----- RESULTS DATA -----
ATTACK DELAY TIME: SERIAL LEVEL
TIME TO OBJECTIVE: SERIAL LEVEL
CASUALTIES: SERIAL LEVEL
EQUIPMENT DAMAGE: SERIAL LEVEL
OTHER FACTORS: SERIAL LEVEL

OTHER RESULTS: SERIAL LEVEL
SUPPRESSION: SERIAL LEVEL

----- CALCULATED DATA -----
RDS/SQ YD: PHASE LEVEL
RDS/SQ YD/MIN: PHASE LEVEL
LBS/SQ YD: PHASE LEVEL
LBS/SQ YD/MIN: PHASE LEVEL
LBS/SQ YD (EQ): PHASE LEVEL
LBS/SQ YD/MIN (EQ): PHASE LEVEL

```

## PHASE

```

SERIAL: 48
TARGET NUMBER: 1
PHASE NUMBER: 1
TIME: ??
----- TARGET DATA -----
TARGET: 16 GERMAN TOWNS, INCLUDING CONNECTING COMMUNICATIONS, ROAD AND RAIL NETWORKS
TARGET AREA: ??
PHASE TACTICS: ??

----- FIRING DATA -----
FIRE UNIT: NUMEROUS BRITISH BOMBER UNITS
TYPE WEAPONS: HE, IG, GP, AND FRAG BOMBS
NUMBER TUBES: ??
TYPE AMMO: ??
ROUNDS PER GUN: ??
NUMBER ROUNDS: ??
FIRE DURATION: 3 DAYS (PERIODIC)
----- RESULTS DATA -----
ATTACK DELAY TIME: SERIAL LEVEL
TIME TO OBJECTIVE: SERIAL LEVEL
CASUALTIES: SERIAL LEVEL
EQUIPMENT DAMAGE: SERIAL LEVEL
OTHER FACTORS: SERIAL LEVEL

OTHER RESULTS: SERIAL LEVEL
SUPPRESSION: SERIAL LEVEL

----- CALCULATED DATA -----
RDS/SQ YD: ??
RDS/SQ YD/MIN: ??
LBS/SQ YD: ??
LBS/SQ YD/MIN: ??
LBS/SQ YD (EQ): ??
LBS/SQ YD/MIN (EQ): ??

```

SERIAL

SERIAL: 47  
 REF NUMBER: A22  
 ORIG REF: 2 ORS/ORS 2TAF JOINT REPORT 3  
 REF TITLE: ROCKET FIRING TYPHOONS IN CLOSE SUPPORT OF MILITARY OPERATNS  
 DATA SOURCE: INTERVIEWS, ACTION REPORTS, GROUND RECCE

----- SERIAL DATA -----

SIDE 1 COUNTRY: BRITAIN  
 SIDE 1 UNITS: CLOSE AIR SUPPORT UNITS  
 SIDE 1 POSTURE: ATTACKING  
 SIDE 2 COUNTRY: GERMANY  
 SIDE 2 UNITS: ASSORTED  
 SIDE 2 POSTURE: PASSIVE

DATE OF ACTION: 1944  
 COUNTRY: FRANCE, BELGIUM, HOLLAND  
 REGION: ??  
 TERRAIN: ??  
 WEATHER: ??  
 TIME: ??

SERIAL TACTICS: INVESTIGATION OF MATERIAL AND MORALE EFFECTS OF ROCKET ATTACKS BY AIRCRAFT

NO. BMRD TARGETS: 2  
 NO. PHASES/TGT: N/A

----- TARGET DATA -----

BOMBARD TARGET: TARGET LEVEL  
 BOMBARD TGT AREA: TARGET LEVEL  
 BOMBARD TACTICS: TARGET LEVEL

----- FIRING DATA -----

FIRE UNIT: TARGET LEVEL  
 TYPE WEAPONS: TARGET LEVEL  
 NUMBER TUBES: TARGET LEVEL  
 TYPE AMMO: TARGET LEVEL  
 ROUNDS PER GUN: TARGET LEVEL  
 NUMBER ROUNDS: TARGET LEVEL  
 FIRE DURATION: TARGET LEVEL

----- RESULTS DATA -----

ATTACK DELAY TIME: TARGET LEVEL  
 TIME TO OBJECTIVE: TARGET LEVEL  
 CASUALTIES: TARGET LEVEL  
 EQUIPMENT DAMAGE: TARGET LEVEL  
 OTHER FACTORS: TARGET LEVEL

OTHER RESULTS: TARGET LEVEL  
 SUPPRESSION: TARGET LEVEL

----- CALCULATED DATA -----

RDS/SQ YD: TARGET LEVEL  
 RDS/SQ YD/MIN: TARGET LEVEL  
 LBS/SQ YD: TARGET LEVEL  
 LBS/SQ YD/MIN: TARGET LEVEL  
 LBS/SQ YD (EQ): TARGET LEVEL  
 LBS/SQ YD/MIN (EQ): TARGET LEVEL

## TARGET

SERIAL: 47  
 TARGET NUMBER: 1  
 NUMBER PHASES: N/A  
 TIME: N/A

----- TARGET DATA -----  
 TARGET: MATERIAL TARGETS: WOODEN STRUCTURES, BRICK STRUCTURE, CONCRETE/STONE STRUCTURES, AA GUNS, TANKS  
 TARGET AREA: N/A  
 TARGET TACTICS: N/A

----- FIRING DATA -----  
 FIRE UNIT: BRITISH AIR UNITS  
 TYPE WEAPONS: TYPHM AIRCR WITH 60 LB RCKTS  
 NUMBER TUBES: N/A  
 TYPE AMMO: N/A  
 ROUNDS PER GUN: N/A  
 NUMBER ROUNDS: N/A  
 FIRE DURATION: N/A

----- RESULTS DATA -----  
 ATTACK DELAY TIME: N/A  
 TIME TO OBJECTIVE: N/A  
 CASUALTIES: N/A  
 EQUIPMENT DAMAGE: WOODEN DEMOLISHED, BRICK DAMAGED, CONCRETE UNDAMAGED  
 OTHER FACTORS: N/A

OTHER RESULTS: AA GUNS DESTROYED, TANKS SERIOUSLY DAMAGED  
 SUPPRESSION: N/A

----- CALCULATED DATA -----  
 RDS/SQ YD: ??  
 RDS/SQ YD/MIN: ??  
 LBS/SQ YD: ??  
 LBS/SQ YD/MIN: ??  
 LBS/SQ YD (EQ): ??  
 LBS/SQ YD/MIN (EQ): ??

## TARGET

SERIAL: 47  
 TARGET NUMBER: 2  
 NUMBER PHASES: N/A  
 TIME: N/A

----- TARGET DATA -----  
 TARGET: PERSONNEL TARGETS  
 TARGET AREA: N/A  
 TARGET TACTICS: N/A

----- FIRING DATA -----  
 FIRE UNIT: BRITISH AIR UNITS  
 TYPE WEAPONS: TYPHM AIRCR WITH 60 LB RCKTS  
 NUMBER TUBES: N/A  
 TYPE AMMO: N/A  
 ROUNDS PER GUN: N/A  
 NUMBER ROUNDS: N/A  
 FIRE DURATION: N/A

----- RESULTS DATA -----  
 ATTACK DELAY TIME: N/A  
 TIME TO OBJECTIVE: N/A  
 CASUALTIES: ROCKETS RARELY PRODUCE CASUALTIES BECAUSE TROOPS TAKE COVER  
 EQUIPMENT DAMAGE: N/A  
 OTHER FACTORS: FRIENDLY TROOP MORALE ENHANCED BY ROCKET ATTACKS ON ENEMY

OTHER RESULTS: N/A  
 SUPPRESSION: MAIN EFFECT ON ENEMY IS MORALE. EFFECTS LAST 1 TO 10 MINUTES AFTER ATTACK ENDS

----- CALCULATED DATA -----  
 RDS/SQ YD: ??  
 RDS/SQ YD/MIN: ??  
 LBS/SQ YD: ??  
 LBS/SQ YD/MIN: ??  
 LBS/SQ YD (EQ): ??  
 LBS/SQ YD/MIN (EQ): ??

SERIAL

SERIAL: 48  
 REF NUMBER: A22  
 ORIG REF: 2 ORS/ORS 2TAF JOINT REPORT 3  
 REF TITLE: ROCKET FIRING TYPHOONS IN CLOSE SPT OF MILITARY OPERATIONS  
 DATA SOURCE: INTERVIEWS AND ACTION REPORTS

----- SERIAL DATA -----

SIDE 1 COUNTRY: BRITAIN  
 SIDE 1 UNITS: INFANTRY BATTALION  
 SIDE 1 POSTURE: ATTACKING  
 SIDE 2 COUNTRY: GERMANY  
 SIDE 2 UNITS: ??  
 SIDE 2 POSTURE: DEFENDING

DATE OF ACTION: 10/13/44  
 COUNTRY: HOLLAND  
 REGION: OVERLOON  
 TERRAIN: WOODLINE AND OPEN FIELD  
 WEATHER: ??  
 TIME: 1400

SERIAL TACTICS: AIRSTRIKES IN SUPPORT OF INFANTRY ATTACK

NO. BMBRD TARGETS: 1  
 NO. PHASES/TGT: 1

----- TARGET DATA -----

BOMBARD TARGET: PHASE LEVEL

BOMBARD TGT AREA: PHASE LEVEL  
 BOMBARD TACTICS: TARGET LEVEL

----- FIRING DATA -----

FIRE UNIT: PHASE LEVEL  
 TYPE WEAPONS: PHASE LEVEL  
 NUMBER TUBES: PHASE LEVEL  
 TYPE AMMO: PHASE LEVEL  
 ROUNDS PER GUN: PHASE LEVEL  
 NUMBER ROUNDS: PHASE LEVEL  
 FIRE DURATION: TARGET LEVEL AND PHASE LEVEL

----- RESULTS DATA -----

ATTACK DELAY TIME: NONE  
 TIME TO OBJECTIVE: ??  
 CASUALTIES: ?? (GERMAN); PRESUMABLY NONE (UK)  
 EQUIPMENT DAMAGE: ??; ??  
 OTHER FACTORS: BRIT MORALE BEFORE AIRSTRIKES WAS LOW BECAUSE OF UNSUCCESSFUL ATK OF THE GERMAN POSITION EARLIER  
 OTHER RESULTS: OBJECTIVE CAPTURED WITHOUT OPPOSITION  
 SUPPRESSION: ROCKET ATTACK UNNERVED GERMANS AND PUT NEW HEAR INTO BRITISH TROOPS

----- CALCULATED DATA -----

RDS/SQ YD: PHASE LEVEL  
 RDS/SQ YD/MIN: PHASE LEVEL  
 LBS/SQ YD: PHASE LEVEL  
 LBS/SQ YD/MIN: PHASE LEVEL  
 LBS/SQ YD (EQ): PHASE LEVEL  
 LBS/SQ YD/MIN (EQ): PHASE LEVEL

## TARGET

SERIAL:	48
TARGET NUMBER:	1
NUMBER PHASES:	1
TIME:	1400
----- TARGET DATA -----	
TARGET:	PHASE LEVEL
TARGET AREA:	PHASE LEVEL
TARGET TACTICS:	AIRSTRIKES IN PREPARATION FOR INFANTRY ATTACK
----- FIRING DATA -----	
FIRE UNIT:	PHASE LEVEL
TYPE WEAPONS:	PHASE LEVEL
NUMBER TUBES:	PHASE LEVEL
TYPE AMMO:	PHASE LEVEL
ROUNDS PER GUN:	PHASE LEVEL
NUMBER ROUNDS:	PHASE LEVEL
FIRE DURATION:	??
----- RESULTS DATA -----	
ATTACK DELAY TIME:	SERIAL LEVEL
TIME TO OBJECTIVE:	SERIAL LEVEL
CASUALTIES:	SERIAL LEVEL
EQUIPMENT DAMAGE:	SERIAL LEVEL
OTHER FACTORS:	SERIAL LEVEL
OTHER RESULTS:	SERIAL LEVEL
SUPPRESSION:	SERIAL LEVEL
----- CALCULATED DATA -----	
RDS/SQ YD:	PHASE LEVEL
RDS/SQ YD/MIN:	PHASE LEVEL
LBS/SQ YD:	PHASE LEVEL
LBS/SQ YD/MIN:	PHASE LEVEL
LBS/SQ YD (EQ):	PHASE LEVEL
LBS/SQ YD/MIN (EQ):	PHASE LEVEL

## PHASE

SERIAL:	48
TARGET NUMBER:	1
PHASE NUMBER:	1
TIME:	1400
----- TARGET DATA -----	
TARGET:	GERMAN POSITION IN EDGE OF WOODLINE
TARGET AREA:	??
PHASE TACTICS:	??
----- FIRING DATA -----	
FIRE UNIT:	BRITISH AIR UNITS
TYPE WEAPONS:	TYPHOON AIRCRAFT WITH ROCKETS
NUMBER TUBES:	??
TYPE AMMO:	??
ROUNDS PER GUN:	??
NUMBER ROUNDS:	??
FIRE DURATION:	??
----- RESULTS DATA -----	
ATTACK DELAY TIME:	SERIAL LEVEL
TIME TO OBJECTIVE:	SERIAL LEVEL
CASUALTIES:	SERIAL LEVEL
EQUIPMENT DAMAGE:	SERIAL LEVEL
OTHER FACTORS:	SERIAL LEVEL
OTHER RESULTS:	SERIAL LEVEL
SUPPRESSION:	SERIAL LEVEL
----- CALCULATED DATA -----	
RDS/SQ YD:	??
RDS/SQ YD/MIN:	??
LBS/SQ YD:	??
LBS/SQ YD/MIN:	??
LBS/SQ YD (EQ):	??
LBS/SQ YD/MIN (EQ):	??

## SERIAL

SERIAL: 49  
REF NUMBER: A22  
ORIG REF: 2 ORS/ORS 2TAF JOINT REPORT 3  
REF TITLE: ROCKET FIRING TYPHOONS IN CLOSE SPT OF MILITARY OPERATIONS  
DATA SOURCE: INTERVIEWS AND ACTION REPORTS

----- SERIAL DATA -----

SIDE 1 COUNTRY: BRITAIN  
SIDE 1 UNITS: 15TH SCOTTISH DIVISION  
SIDE 1 POSTURE: PSYCH OPER  
SIDE 2 COUNTRY: GERMAN  
SIDE 2 UNITS: ??  
SIDE 2 POSTURE: DEFENDING

DATE OF ACTION: 09/28/44  
COUNTRY: BELGIUM AND HOLLAND  
REGION: ??  
TERRAIN: ??  
WEATHER: ??  
TIME: 1000

SERIAL TACTICS: PSYCH OPERATION (LOUDSPEAKER) TO ADVISE GERMANS OF DEADLY ACCURACY O  
F ROCKETS DELIVERED BY TYPHOONS

NO. BMBRD TARGETS: 1  
NO. PHASES/TGT: 2

----- TARGET DATA -----

BOMBARD TARGET: TARGET LEVEL

BOMBARD TGT AREA: TARGET LEVEL  
BOMBARD TACTICS: TARGET LEVEL

----- FIRING DATA -----

FIRE UNIT: PHASE LEVEL  
TYPE WEAPONS: PHASE LEVEL  
NUMBER TUBES: PHASE LEVEL  
TYPE AMMO: PHASE LEVEL  
ROUNDS PER GUN: PHASE LEVEL  
NUMBER ROUNDS: PHASE LEVEL  
FIRE DURATION: TARGET LEVEL AND PHASE LEVEL

----- RESULTS DATA -----

ATTACK DELAY TIME: PHASE LEVEL  
TIME TO OBJECTIVE: PHASE LEVEL  
CASUALTIES: PHASE LEVEL  
EQUIPMENT DAMAGE: PHASE LEVEL  
OTHER FACTORS: PHASE LEVEL

OTHER RESULTS: PHASE LEVEL  
SUPPRESSION: PHASE LEVEL

----- CALCULATED DATA -----

RDS/SQ YD: PHASE LEVEL  
RDS/SQ YD/MIN: PHASE LEVEL  
LBS/SQ YD: PHASE LEVEL  
LBS/SQ YD/MIN: PHASE LEVEL  
LBS/SQ YD (EQ): PHASE LEVEL  
LBS/SQ YD/MIN (EQ): PHASE LEVEL

## TARGET

SERIAL:	49
TARGET NUMBER:	1
NUMBER PHASES:	2
TIME:	1055
----- TARGET DATA -----	
TARGET:	GERMAN POSITIONS IN WOODLINE
TARGET AREA:	??
TARGET TACTICS:	AIRSTRIKE IN SUPPORT OF PSYCHOLOGICAL OPERATIONS
----- FIRING DATA -----	
FIRE UNIT:	PHASE LEVEL
TYPE WEAPONS:	PHASE LEVEL
NUMBER TUBES:	PHASE LEVEL
TYPE AMMO:	PHASE LEVEL
ROUNDS PER GUN:	PHASE LEVEL
NUMBER ROUNDS:	PHASE LEVEL
FIRE DURATION:	??
----- RESULTS DATA -----	
ATTACK DELAY TIME:	PHASE LEVEL
TIME TO OBJECTIVE:	PHASE LEVEL
CASUALTIES:	PHASE LEVEL
EQUIPMENT DAMAGE:	PHASE LEVEL
OTHER FACTORS:	PHASE LEVEL
OTHER RESULTS:	PHASE LEVEL
SUPPRESSION:	PHASE LEVEL
----- CALCULATED DATA -----	
RDS/SQ YD:	PHASE LEVEL
RDS/SQ YD/MIN:	PHASE LEVEL
LBS/SQ YD:	PHASE LEVEL
LBS/SQ YD/MIN:	PHASE LEVEL
LBS/SQ YD (EQ):	PHASE LEVEL
LBS/SQ YD/MIN (EQ):	PHASE LEVEL

## PHASE

SERIAL:	49
TARGET NUMBER:	1
PHASE NUMBER:	1
TIME:	1100
----- TARGET DATA -----	
TARGET:	TARGET LEVEL
TARGET AREA:	TARGET LEVEL
PHASE TACTICS:	??
----- FIRING DATA -----	
FIRE UNIT:	BRITISH AIR UNITS
TYPE WEAPONS:	TYPHOON AIRCRAFT WITH ROCKETS
NUMBER TUBES:	??
TYPE AMMO:	??
ROUNDS PER GUN:	??
NUMBER ROUNDS:	??
FIRE DURATION:	??
----- RESULTS DATA -----	
ATTACK DELAY TIME:	NO ATTACK SCHEDULED
TIME TO OBJECTIVE:	N/A
CASUALTIES:	2 POW (GERMAN);?? (BRITISH)
EQUIPMENT DAMAGE:	??;??
OTHER FACTORS:	DIVISIONAL INTELL OFFICER USED LOUDSPEAKER FOR 10 MINUTES TO WARN GE RHANS OF EFFECTS OF ROCKETS
OTHER RESULTS:	MORE GERMANS WANTED TO SURRENDER BUT WERE STOPPED BY OWN MG FIRE
SUPPRESSION:	??
----- CALCULATED DATA -----	
RDS/SQ YD:	??
RDS/SQ YD/MIN:	??
LBS/SQ YD:	??
LBS/SQ YD/MIN:	??
LBS/SQ YD (EQ):	??
LBS/SQ YD/MIN (EQ):	??

# PHASE

SERIAL: 49  
TARGET NUMBER: 1  
PHASE NUMBER: 2  
TIME: 1300

----- TARGET DATA -----  
TARGET: TARGET LEVEL

TARGET AREA: TARGET LEVEL  
PHASE TACTICS: ??

----- FIRING DATA -----  
FIRE UNIT: BRITISH AIR UNITS  
TYPE WEAPONS: TYPHOON AIRCRAFT WITH ROCKETS  
NUMBER TUBES: ??  
TYPE AMMO: ??  
ROUNDS PER GUN: ??  
NUMBER ROUNDS: ??  
FIRE DURATION: ??

----- RESULTS DATA -----  
ATTACK DELAY TIME: NO ATTACK SCHEDULED  
TIME TO OBJECTIVE: N/A  
CASUALTIES: ADDTNL GERMANS SURR TO BRIT PATROL (GERMAN):?? (BRITISH)  
EQUIPMENT DAMAGE: ??;??  
OTHER FACTORS: AFTER 1ST ATTACK AT 1100 GERMANS RETREATED TO CENTER OF WOODS TO PREVENT OWN TROOPS FROM SURRENDER  
OTHER RESULTS: ??  
SUPPRESSION: ??

----- CALCULATED DATA -----  
RDS/SQ YD: ??  
RDS/SQ YD/MIN: ??  
LBS/SQ YD: ??  
LBS/SQ YD/MIN: ??  
LBS/SQ YD (EQ): ??  
LBS/SQ YD/MIN (EQ):??

## APPENDIX F

### ACRONYMS AND ABBREVIATIONS

AP	Armor Piercing
ARI	Army Research Institute
BAS	Bombardment Analysis Sheet
CAA	Concepts Analysis Agency
CASTFOREM	Combined Arms task Force Evaluation Model
CDEC	Combat Developments Experimentation Command
CORDA	Centre for Operational Research and Defence Analysis
fd	field
FORCEM	Force Evaluation Model
HE	High Explosive
HEL	Human Engineering Laboratory
med	medium
mm	millimeter
OR	Operational Research
recce	reconnaissance
SAIC	Science Applications International Corporation
UK	United Kingdom
VIC	Vector-In-Command
WW II	World War II
25pr	25-pounder British Artillery Piece