AD-A182 343 CONCEPTS EVALUATION MODEL VI (CEM VI) VOLUME 2 CEM USER'S HANDBOOK(U) ARMY CONCEPTS ANALYSIS AGENCY BETHESDA MD W T ALLISON AUG 85 CAA-D-85-1-VOL-1 1/3

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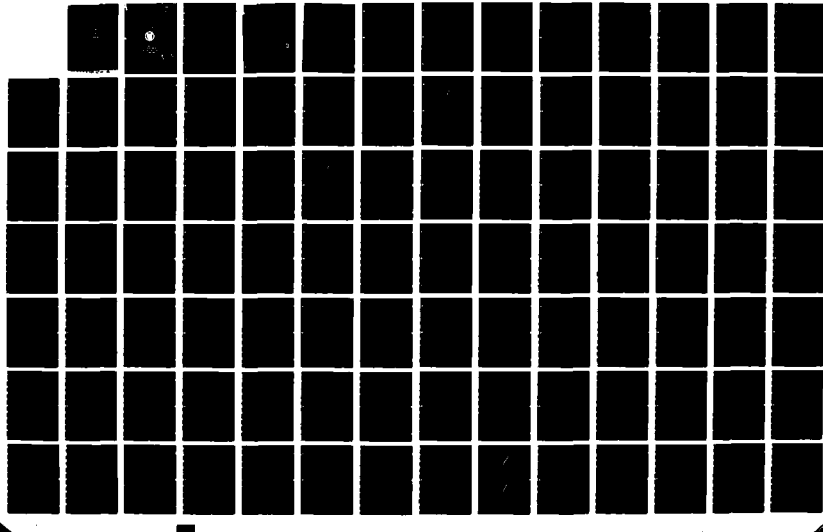

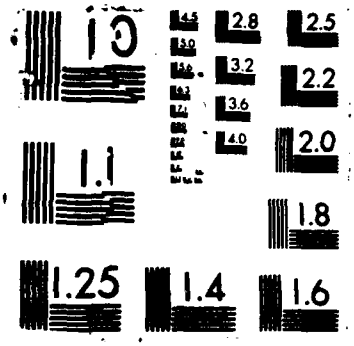
2.8
2.5
3.2
2.2
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4.0
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1.6

DOCUMENTATION
CAA-D-85-1

CONCEPTS EVALUATION MODEL VI
(CEM VI)

VOLUME II - USER'S HANDBOOK

AUGUST 1985

PREPARED BY
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20. ABSTRACT (Continue on reverse side if necessary and identify by block number)

The Concepts Evaluation Model (CEM) is a fully automated, deterministic combat simulation that can simulate months of theater land and air combat in a few hours on a computer. A unique feature of the CEM is the simulation and automation of the commanders' decision processes and utilization of resources at all echelons from division through theater. Results of combat are sensitive to the mix of major weapons within the combat forces, and the pace of combat depends on the expenditure and attrition of resources along with the associated resupply. (continued)

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This document provides a complete description of the input (other than the killer/victim data) and their formats required for the CEM VI, as well as a description of the reports generated by the CEM VI, and its post processor. The structure of the CEM VI input data is indicated along with an explanation of the error diagnostic messages generated by the CEM VI preprocessors is included. References are provided to both Volumes I and II where more complete explanations are provided as to the input data used by CEM VI.

Keywords: input; command and control systems; message processing

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(CEM VI)

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AUGUST 1985

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CONTENTS

FIGURES

CONCEPTS EVALUATION MODEL VI (CEM VI)

VOLUME II - USER'S HANDBOOK

CHAPTER 1

CEM VI INPUT DATA STRUCTURE

1-1. DATA INPUTS. Data inputs required by CEM are organized into six sections: RUN, SCENARIO, UNITS, CONSTANT, AIR, and TABLES (see Figure 1-1). The presentation format and the structure of each of these sections moves from macro through micro description. Individual sample card formats providing parameter inputs and their description are included. For more information concerning the utilization of some input parameters in CEM, page references to other parts of this report are included. Each input data section and logical subsections, if any, are illustrated. Card columns designated as "Blank" must remain free of any punched information.

1-2. ILLUSTRATIVE ERROR MESSAGES. Illustrative error messages that may be generated by the data inputs in the preprocessor (not by the operating system) and diagnostics for each section are presented. In addition, Section Card, Sequence Check, and Data Subroutine errors applicable to each of the six section decks have been included under a separate, concluding heading.

1-3. DATA ERROR MESSAGES. It should be noted that the data error messages produced by the CEM preprocessor are printed immediately following the input card containing the error. The user can determine from the preprocessor listing the section--RUN, SCENARIO, etc.--in which the error has been detected. It is for this reason that the error messages/diagnostics pertinent to a particular section deck are included herein with the descriptive material for the appropriate section rather than under a separate "Error Message/ Diagnostics" subheading.

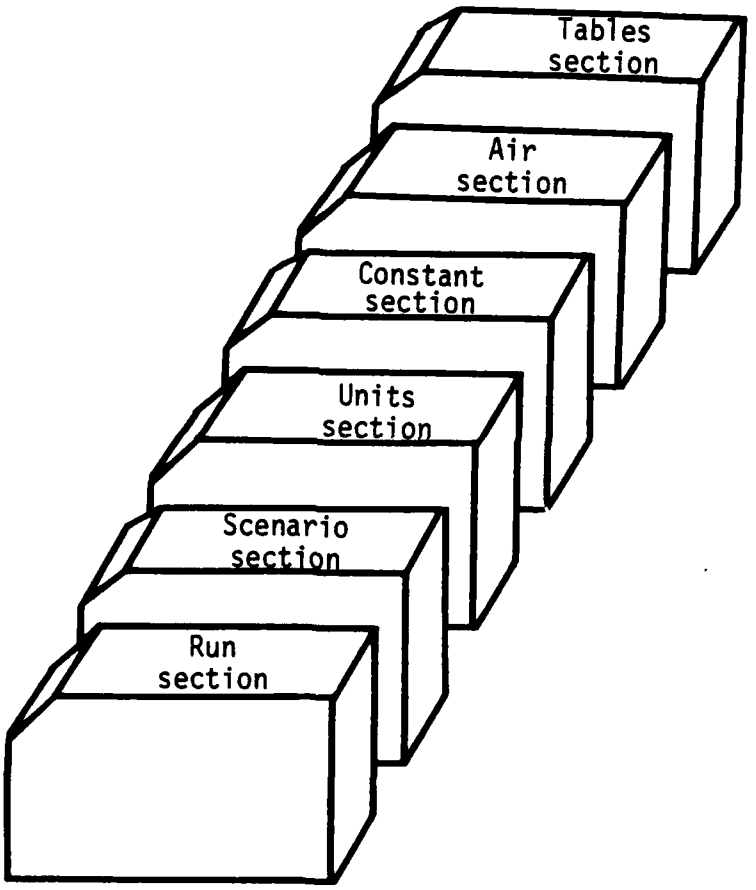
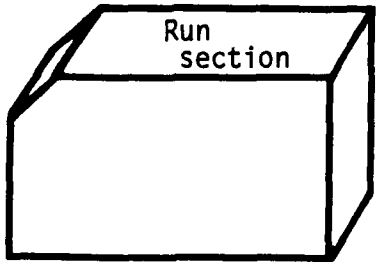


Figure 1-1. Input Data Deck Structure

RUN SECTION



The Run Section sets up limits and levels of resolution that control the execution of the CEM program. Formats and descriptions are included as follows:

Input Data Card Listing
Run Section Card
Run Title Card
Run Cycle Specification Card
Report Options Card
Error Options Card
TOS Options Card
Input Count Cards
Run Section Error Messages/Diagnostics

```
SECTION    RUN        SEWIGNOR       5
RUNTITLE   TITLE OF THIS SIMULATION IS ENTERED HERE
RUNLIMIT       2     2     2     0     1
PRNTOPTN   STANDARD        1     SCAL THTR    10                 1     1 1 1 1
ERROPTN    DUMP
BLUE TOS        NO
COUNTS         5     1     0     0     1   5 5  1  2  1  2.52      1
COUNTS         3     2    30     3     2   6 5  1  2  1  2 21      4
```

RUN SECTION CARD

FORMAT 2A4,2X,2A4,2X,2A4,2X,I5,37X,A3,I5

Col 1- 8	"SECTION" first card of section 1 (left justified)
Col 9-10	Blank
Col 11-18	"RUN" section name (left justified)
Col 19-20	Blank
Col 21-28	"SEQCOMNT" ignore out of sequence cards, but comment (does not terminate preprocessor) (left justified) "SEQABORT" abort preprocessor run if Col 76-80 not in "SEQIGNOR" sequence (ascending order) ignore and do not comment on any out of sequence cards
Col 29-30	Blank
Col 31-35	Logical input unit from which this section of data can be read by preprocessor (right justified)
Col 36-72	Optional comments
Col 73-75	Hollerith sequence label (not checked by preprocessor)
Col 76-80	Sequence number

Notes:

Col 21-28 options deal with cards in this section only.

Col 31-35: if logical input unit is zero or missing, input will be read from logical unit 5.

RUN TITLE CARD

FORMAT 2A4,2X,15A4,2X,A3,I5

Col 1- 8	"RUNTITLE"
Col 9-10	Blank
Col 11-70	Title user wishes to be printed with reports
Col 71-72	Blank
Col 73-75	Hollerith sequence label (not checked by preprocessor)
Col 76-80	Sequence number

RUN CYCLE AND OPTIONS CARD

FORMAT 2A4,2X,6I5,32X,A3,I5

Col 1- 8	"RUNLIMIT"
Col 9-10	Blank
Col 11-15	Number of theater cycles model is to run, > 0
Col 16-20	Number of army cycles per theater cycle, > 0, ≤ 7
Col 21-25	Number of corps cycles per army cycle, 0
Col 26-30	Number of division cycles per corps cycle, > 0
Col 31-35	ON/OFF for disjoint FEBA logic, OFF = "0" or "blank," ON = "1"
Col 36-40	Not used
Col 41-45	Equipment interchangeability switch: 1 = Blue only 2 = Red only 3 = Both Blue and Red
Col 46-72	Optional comments
Col 73-75	Sequence label
Col 76-80	Sequence number

REPORT OPTIONS CARD

FORMAT 2A4,2X,2A4,2X,I5,5X,A4,1X,A4,1X,I5,10X,2I5,3I2,I1,A3,I5

Col 1- 8	"PRNTOPTN"
Col 9-10	Blank
Col 11-18	"STANDARD"-Standard Theater Summary Report
Col 19-20	Blank
Col 21-25	Number of theater cycles which each theater report will cover, > 0*
Col 26-30	Blank
Col 31-34	Blank = Both scaled and fixed scale FEBA maps reported
Col 35	Blank
Col 36-39	"DIV" = Logistic report at end of each division cycle and theater cycle "THTR" = Logistic report at end of last division cycle per theater cycle and theater cycle
Col 40	Blank
Col 41-45	Vertical scale value for theater FEBA map in minisectors per line of print (a zero or blank will default to 5 minisectors per line)
Col 46-55	Not used
Col 56-60	Division cycles covered for FEBA and tactical reports
Col 61-65	Time interval in days for bde freq report
Col 66-67	ON/OFF for combat unit trace**
Col 68-69	Not used
Col 70-71	ON/OFF for ADDCOP system**
Col 72	ON/OFF for WARF data***
Col 73-75	Sequence label
Col 76-80	Sequence number

---

*Not presently operational in CEM postprocessor. CEM preprocessor requires input card as shown above.

**Blank = OFF, 1 = ON.

***Blank = No WARF data generated.
1,2,3 = Partition for WARF data (authorized levels).

ERROR OPTIONS CARD

FORMAT	2A4,2X,2A4,54X,A3,I5
Col 1- 8	"ERROPTN"
Col 9-10	Blank
Col 11-18	"NODUMP" = If error detected by CEM, no core dump will be given. "DUMP" = if error detected by CEM, core will be dumped.
Col 19-72	Blank
Col 73-75	Sequence label
Col 76-80	Sequence number

Note: These options concern CEM-detected errors only, not system-detected errors.

TOS OPTIONS CARD

FORMAT 2A4,6X,A4,54X,A3,I5

Col 1- 8	"BLUE TOS"
Col 9-14	Blank
Col 15-18	"YES" = Blue will have increased ability to detect Red upcoming situation. (This switch permits Blue to examine Red's upcoming deployment/estimate as a function of the intelligence coefficients (e and f) where e = 1.0 gives perfect information on upcoming cycle, and f = 1.0 gives perfect information of last cycle.) "NO" = no TOS simulated
Col 19-20	Blank
Col 21-72	Optional comments
Col 73-75	Sequence label
Col 76-80	Sequence number

INPUT COUNT CARD*

FORMAT 2A4,2X,6I5,7I3,11X,A3,I5

Col 1- 8	"COUNTS"
Col 9-10	Blank
Col 11-15	Quantity of maneuver unit bn types for this side
Col 16-20	Quantity of armies for this side**
Col 21-25	Quantity of reinforcing divisions
Col 26-30	Quantity of cards "ARRVDVSN" which specify the arrival schedule of the reinforcing divisions in theater (max 50 cards)
Col 31-35	Quantity of cards "ARRVARTY" which specify the arrival schedule of the reinforcing artillery in theater (max 50 cards)
Col 36-40	Quantity of cards "LOGISTIC" which specify the arrival schedule of the replacement to resupply in theater (max 50 different theater cycles)
Col 41-43	Count of tank type weapons, ≤ 12
Col 44-46	Count of light armor type weapons, ≤ 12
Col 47-49	Count of helicopter type weapons (Blue side only), ≤ 5
Col 50-52	Count of antitank/mortar type weapons, ≤ 12
Col 53-58	Not used
Col 59-61	Number of cards "ARRMAINT" which specify the time-phased maintenance capacity
Col 62-72	Optional comments
Col 73-75	Sequence label
Col 76-80	Sequence number

---

*Two cards (Blue and Red); Red follows Blue.

**Quantity Blue armies, $> 0, \leq 6$.
Quantity Red armies, $> 0, \leq 12$.

RUN SECTION ERROR MESSAGES/DIAGNOSTICS

"***ILLEGAL ERROR OPTION"

The "ERROPTN" card may only contain one of the following options in Col 11-18. The entry must start in Col 11.

1. "NODUMP"
2. "DUMP"

"***NONPOSITIVE CYCLE COUNT"

An entry on the "RUNLIMIT" card is less than or equal to zero (0).

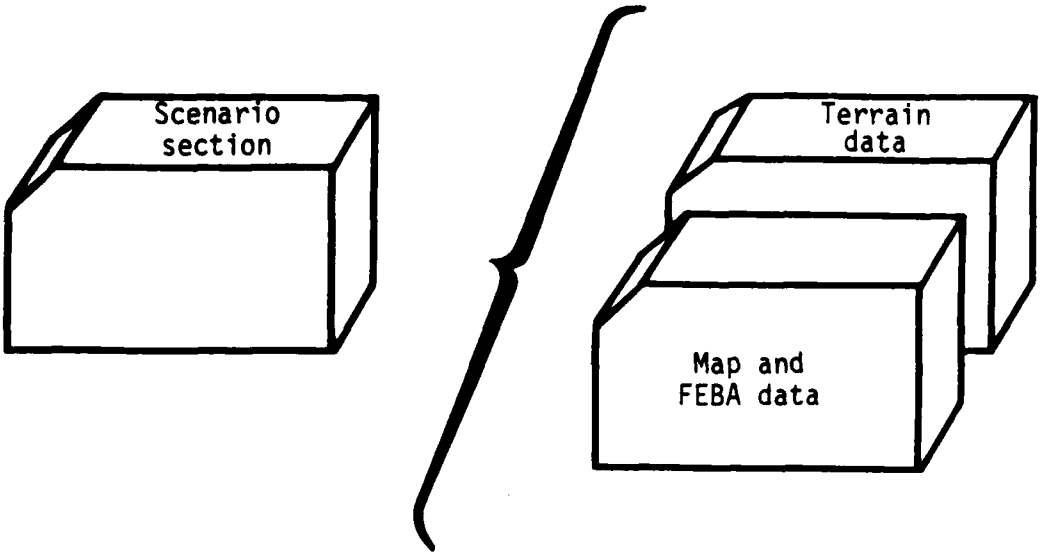
"***NUMBER OF ARMY CYCLES PER THEATER CYCLE GREATER THAN SEVEN"

On the "RUNLIMIT" card the user has specified more than seven (7) army cycles per theater cycle.

"***ILLEGAL TOS OPTION"

The "BLUE TOS" card may have only "YES" or "NO" in Col 15-18, right justified.

SCENARIO SECTION



The Scenario Section defines the theater battlefield size, level of resolution of terrain, and the initial FEBA. The following descriptions are included:

Sample Terrain Data Layout
Sample Input Data Card Listing*
Scenario Section Card
Minisector Description Card
Initial FEBA Location Card
Map End Points Card
Movement Factors Card
Default Terrain Card
Terrain Description Card
Additional Terrain Description
Scenario Section Error Messages/Diagnostics Description

---

*This listing details a portion of the input data cards required to "Code" the terrain as illustrated on the Sample Terrain Data Layout ("map").

```
SECTION    SCENARIO  SEQIGNOR        5
MINISCTR    273    21     5     3   .02   200      9   3.0   2.0      9
FEBALOCN      1   273  7201
ENDPNTS     500  7351   500  7351   500  7351
MOVEFCTR     .6   4.8   4.8   1.0
OFLTTERN      8
TERRAIN    2300  2500  C  2501  3200  A  4200  4300  A  4301  4799  C   1
TERRAIN       4  4800  D  5000  5600  A  6200  6399  A    20  6400  D   1
TERRAIN    6401  7199  A  7200  7900  A  7901  8100  C  8500  8700  C   1
TERRAIN    9300  9500  C     0     0        0     0        0     0      1
TERRAIN    4300  4400  A  4401  4899  C     4  4900  D  4901  5300  C   2
TERRAIN    5500  6300  A    20  6500  D  6501  6700  A  7100  7199  A   2
TERRAIN    7200  8600  A  9300  9400  A     0     0        0     0      2
TERRAIN    2500  3500  A  4000  4600  C     4  4800  D  4801  5500  C   3
TERRAIN    5501  6100  A    20  6400  D  6500  6900  C  7100  7199  C   3
TERRAIN    7200  7500  C  7501  8300  A  9000  9100  A     0     0      3
TERRAIN    2600  3400  A  3600  4000  A  4001  4799  C     4  4800  D   4
TERRAIN    4801  5800  C  5801  6200  A  6400  6499  A    20  6500  D   4
TERRAIN    6501  6800  A  6801  7000  C  7001  7199  A  7200  8000  C   4
TERRAIN    8001  9800  A     0     0        0     0        0     0      4
TERRAIN    3700  3900  A  3901  4799  C     4  4800  D  4801  6299  C   5
TERRAIN      20  6300  D  6301  6700  A  7100  7199  A  7200  7600  A   5
TERRAIN    7700  8100  C  8101  8900  A  9200  9300  A     0     0      5
TERRAIN    3400  3800  A  3801  4899  C     4  4900  D  4901  6399  C   6
TERRAIN      20  6400  D  6401  7000  A  7001  7200  C  7400  7600  A   6
TERRAIN    8000  8800  A  8801  9000  C  9001  9400  A     0     0      6
TERRAIN    3100  3900  A  3901  4100  C  4500  4999  C     4  5000  D   7
TERRAIN    5001  6499  C    20  6500  D  6700  7100  A  7101  7199  C   7
TERRAIN    7200  7500  C  7700  9900  A     0     0        0     0      7
TERRAIN    3200  4000  A  5000  5099  C     4  5100  D  5101  5800  C   8
TERRAIN    5801  6599  A    20  6600  D  6601  7200  A  7301  7600  A   8
TERRAIN    7900  9400  A 10100 10200  C     0     0        0     0      8
TERRAIN    3900  4400  A  4401  4800  C  4801  5000  A     4  5200  D   9
TERRAIN    5700  6499  A    20  6500  D  6501  7199  A  7200  7400  A   9
TERRAIN    7900  8000  C  8001  9600  A  9000  9800  A     0     0      9
TERRAIN    2900  3700  A  3701  3900  C  4900  5199  C     4  5200  D  10
TERRAIN    5201  5500  C    20  6300  D  6600  7100  A  7600  7900  C  10
TERRAIN    7901  8500  A  9000  9100  A  9400  9500  A     0     0     10
TERRAIN    2800  3400  A  4800  5200  A  5201  5399  C     4  5400  D  11
TERRAIN    5401  6000  C  6001  6399  A    20  6400  D  6401  6600  A  11
TERRAIN    7100  7200  A  7700  7800  C  8500  8800  A  9700 10000  A  11
TERRAIN       0     0        0     0        0     0        0     0     11
TERRAIN    3700  4900  C  4901  5399  A     4  5400  D  5401  5700  A  12
TERRAIN    5701  6299  C    20  6300  D  6301  6500  A  6501  6700  C  12
TERRAIN    7000  7200  A  7201  7500  A  7700  8100  C  8101  8700  A  12
TERRAIN    8701  9300  C  9301  9900  A     0     0        0     0     12
TERRAIN    3500  4200  C  4201  4400  A  5100  5499  A    11  5700  D  13
TERRAIN    5701  5800  A  5801  6199  C    20  6200  D  6201  6800  C  13
TERRAIN    6801  7200  A  7201  7600  A  7900  8000  C  8900  9000  A  13
TERRAIN    9300  9800  A     0     0        0     0        0     0     13
```

SCENARIO SECTION CARD

FORMAT	2A4,2X,2A4,2X,2A4,2X,I5,37X,A3,I5
Col 1- 8	"SECTION" first card of section 2
Col 9-10	Blank
Col 11-18	"SCENARIO" section name
Col 19-20	Blank
Col 21-28	"SEQCOMNT" ignore out of sequence cards, but comment (does not terminate preprocessor) "SEQABORT" abort preprocessor run if Col 76-80 not in sequence (ascending order) "SEQIGNOR" ignore and do not comment on any out of sequence cards
Col 29-30	Blank
Col 31-35	Logical input unit where this section of data will be read by preprocessor
Col 36-72	Optional comments
Col 73-75	Sequence label
Col 76-80	Sequence number

MINISECTOR/WEAK DIVISION CARD

FORMAT 2A4,2X,4I5,F5.2,2I5,2F5.0,I5,F5.0,7X,A3,I5

Col 1- 8	"MINISCTR"
Col 9-10	Blank
Col 11-15	Number of minisectors in theater, $>$ 0, $\leq$ 1,000
Col 16-20	Number of minisectors per terrain band, $>$ 0*
Col 21-25	Minimum Blue division frontage, $\geq$ 3 minisectors
Col 26-30	Minimum Red division frontage, $\geq$ 1 minisector
Col 31-35	Force density ratio of flanks to front
Col 36-40	Maximum allowable flank in hectometers
Col 41-45	Maximum number of divisions which can exist in a Blue army reserve pool,** max $\leq$ 9
Col 46-50	If the defense switch is "on" (cols 41-45 $>$ 0), and the Blue divisions's atk/def DRIFP is greater than this entry, and the Blue division is at minimum frontage +1 minisector, the Blue division is "tagged" as a weak division
Col 51-55	If the ratio of COMBAT WORTH X STATE of the strongest army's reserve division to the Army's weakest on-line division is greater than this entry, the strongest Army reserve division will replace the weakest on-line division
Col 56-60	Maximum number of divisions which can exist in a Red army reserve pool, maximum number is 9
Col 61-65	Number of minisectors per kilometer frontage
Col 66-72	Blank
Col 73-75	Sequence label
Col 76-80	Sequence number

---

*Number of minisectors/terrain band $<$ number of minisectors in the theater. There may not be more than 100 terrain bands in the theater.

**If this entry is zero (0), the defense switch is considered off. If this entry is negative, it indicates the maximum size of the army reserve pools, while weak on-line division replacement is prevented.

INITIAL FEBA LOCATION CARD

FORMAT 2A4,2X,3(3I5,5X),2X,A3,I5

Col 1- 8	"FEBALOCN"
Col 9-10	Blank
Col 11-15	Low minisector boundary (minisectors are numbered from top (low) to bottom (high)
Col 16-20	High minisector boundary
Col 21-25	FEBA coordinates which fall between the high and low minisector coordinates defined in Col 11-15, 16-20
Col 26-30	Blank
Col 31-35	Low minisector boundary for segment 2 of the FEBA (should there be more than 1 segment)
Col 36-40	High minisector boundary for segment 2
Col 41-45	FEBA coordinate for segment 2
Col 46-50	Blank
Col 51-55	Same as Col 31-35 (for segment 3)
Col 56-60	Same as Col 36-40 (for segment 3)
Col 61-65	Same as Col 41-45 (for segment 3)
Col 66-72	Blank
Col 73-75	Sequence label
Col 76-80	Sequence numbers

Notes:

Additional "FEBALOCN" card would be for segments 4-6, 7-9, etc., until all minisectors in the theater have been assigned a FEBA coordinate.

Up to three FEBA locations may be defined on one card and there may be more than one card defining the FEBA for the theater.

MAP END POINTS CARD

FORMAT 2A4,2X,12I5,2X,A3,I5

Col 1- 8	"ENDPNTS" This card describes the edge of the battlefield (for each 100 minisectors) in basic terrain coordinates, such as hectometers
Col 9-10	Blank
Col 11-15	Minisector 1-100 western edge of battlefield
Col 16-20	Minisector 1-100 eastern edge of battlefield
Col 21-25	Minisector 101-200 western edge
Col 26-30	Minisector 101-200 eastern edge
Col 31-35	Minisector 201-300 western edge
Col 36-40	Minisector 201-300 eastern edge
Col 41-45	Minisector 301-400 western edge
Col 46-50	Minisector 301-400 eastern edge
Col 51-55	Minisector 401-500 western edge
Col 56-60	Minisector 401-500 eastern edge
Col 61-65	Minisector 501-600 western edge
Col 66-70	Minisector 501-600 eastern edge
Col 71-72	Blank
Col 73-75	Sequence label
Col 76-80	Sequence number

Notes:

Should there be more than 600 minisectors to the theater frontage an additional card "ENDPNTS" must be used. This card specifies the FEBA coordinates beyond which the FEBA will not advance. A pair of coordinates is specified for each hundred minisectors of the theater. If the FEBA within those minisectors falls below the first (lower) coordinate, Red will not advance further. Similarly, if the FEBA within those minisectors exceeds the second (higher) coordinate, Blue will not advance further within those minisectors.

$500 \leq$ end pt $\leq 16,383$.

MOVEMENT FACTORS CARD

FORMAT	2A4,2X,4F5.0,42X,A3,I5
Col 1- 8	"MOVEFCTR"
Col 9-10	Blank
Col 11-15	Exponential smoothing coefficient, W*
Col 16-20	Threshold used only by Red to estimate whether Blue has prepared defense (or barrier). If the computed average FEBA movement rate is less than this threshold, Red estimates that Blue is in a prepared defense (or barrier), otherwise Red estimates the defense as hasty*
Col 21-25	Threshold to determine if Red is in a prepared or hasty defense for both estimation and actual engagement. Comparison is made as described above*
Col 26-30	FEBA movement modifier applied when assessing outcome and Blue mission is delay with a barrier**
Col 31-72	Optional comments
Col 73-75	Sequence label
Col 76-80	Sequence number

---

*See para 5-2c in Volume I for explanation of defensive position determinations.

**See para 5-4h in Volume I for explanation of this modifier.

DEFAULT TERRAIN CARD

FORMAT	2A4,3X,A4,57X,A3,I5
Col 1- 8	"DFLTTERN"
Col 9-14	Blank
Col 15	Default terrain Type A or B or C. On subsequent cards the terrain type(s) within each terrain band will be specified; where terrain is not specified the default terrain type will be assumed
Col 16-72	Optional comments
Col 73-75	Sequence label
Col 76-80	Sequence number

Notes:

Type D terrain may not be default type.

On subsequent "TERRAIN" cards the default terrain may not appear.

TERRAIN DESCRIPTION CARD

FORMAT 2A4,2X,4(2I5,1X,A4),2X,A3,I5

Col 1- 8	"TERRAIN"
Col 9-10	Blank
Col 11-15	Low FEBA coordinate* (if Type D terrain enter index number)
Col 16-20	High FEBA coordinate* (Type D terrain is always 1 hm wide)
Col 21-24	Blank
Col 25	Terrain class A, B, C, or D (may not be default terrain)
Col 26-30	Same as Col 11-15
Col 31-35	Same as Col 16-20
Col 36-39	Blank
Col 40	Same as Col 25
Col 41-45	Same as Col 11-15
Col 46-50	Same as Col 16-20
Col 51-54	Blank
Col 55	Same as Col 25
Col 56-60	Same as Col 11-15
Col 61-65	Same as Col 16-20
Col 66-69	Blank
Col 70	Same as Col 25
Col 71-72	blank
Col 73-75	Sequence label
Col 76-80	Sequence number

---

*Low FEBA coordinate--west, high FEBA coordinate--east.

Notes:

Entries for a single terrain band must be in ascending FEBA coordinate order.

See following page for additional information.

TERRAIN DESCRIPTION CARD (continued)

The preprocessor recognizes the start and end of each terrain band as follows:

1. Each terrain band coded must begin in the first field of a card (Col 11-15, low FEBA coordinate).

2. The end of a terrain band is recognized when a blank entry is encountered.

The type D terrain previously mentioned is considered the roughest terrain (mountains, rivers, etc.) with Type A terrain considered the best suited for travel. When coding Type D terrain each continuous river and/or mountain is coded with an identifying index number so as to differentiate it from other Type D terrain. Each indexed Type D terrain may be one terrain band in length or several ($\leq$ quantity of terrain bands defined in the "MINISCTR" card).

SCENARIO SECTION ERROR MESSAGES/DIAGNOSTICS

"***FEBA NOT SPECIFIED FOR MINISECTOR _____"
"TOTAL _____"

In defining the initial FEBA one or more minisectors within the theater frontage have not been assigned FEBA locations.

"***INPUT VALUE OUT OF RANGE ON ABOVE CARD"

Number of terrain bands in the theater is less than zero (0) or greater than one hundred (100).

"***INCONSISTENCY IN ENTRY XX ON ABOVE CARD"

In defining the initial FEBA location one of the following has occurred:

1. Low minisector coordinate is $\leq$ 0.
2. Low minisector coordinate is $>$ number of minisector coordinates defined on the "MINISCTR" card, Col 11-15.
3. High minisector coordinate is $\leq$ 0.
4. High minisector coordinate is $>$ number of minisector coordinates defined on the "MINISCTR" card, Col 11-15.
5. Low minisector coordinate is $>$ high minisector coordinate.

"***NUMBER OF ENTRIES FOR THIS TERRAIN BAND EXCEEDS MAXIMUM"

A maximum fifty (50) variations per terrain band has been exceeded.

"***DATA INCONSISTENCY ON ABOVE CARD"

A low minisector coordinate on card image listed above this message is greater than the high minisector coordinate defined for this terrain type.

"***ENTRIES FOR THIS TERRAIN BAND NOT IN ASCENDING KM ORDER"

The coordinates given for a terrain type are not in ascending sequence from left to right, i.e.,:

1. The low coordinate is $\leq$ the high coordinate for the previous terrain type within this terrain band.
2. The high coordinate is $\leq$ the high coordinate for the previous terrain type within the terrain band.

"***NUMBER OF TERRAIN BANDS REQUIRED EXCEEDS 100"

A maximum of 100 terrain bands has been exceeded. The "MINISCTR" card defines:

1. The total minisectors in the theater.
2. The quantity of minisectors per terrain band.

Item 1 divided by item 2 = terrain band in theater.

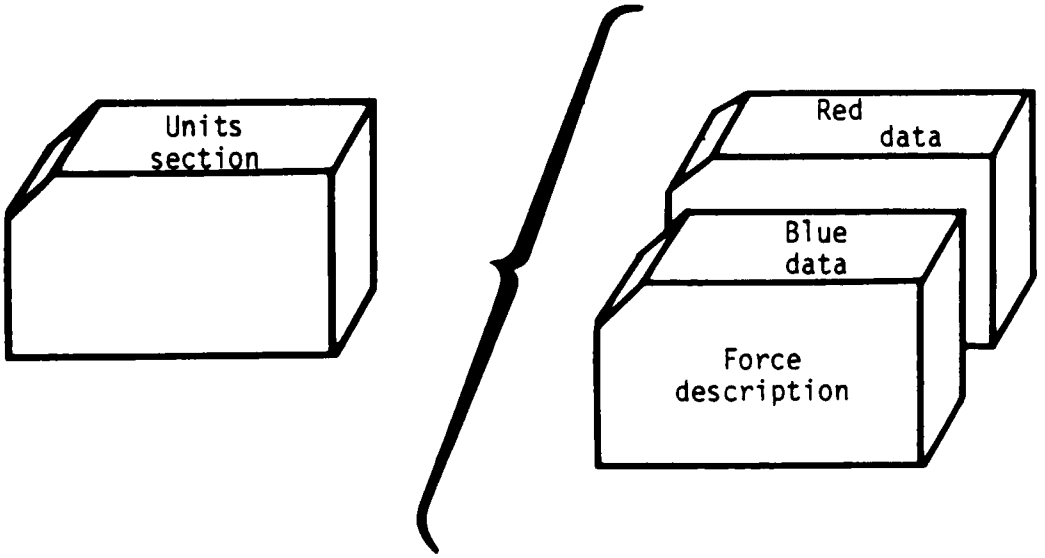
"***DEFAULT TERRAIN NOT A, B, OR C"

The default terrain specified on the "DFLTTERN" card Col 15 must be either A, B, or C. (D type terrain may not be default terrain.)

"***MAP END PTS. INCONSISTENT WITH FEBA"

The initial FEBA has some segment located outside the boundaries of the map end points.

UNITS SECTION



The Units Section describes the composition, organization, and initial deployment of the Red and Blue forces. Formats and descriptions are as follows:

Blue Force Input Deck Structure, Figure 1-2
Sample Blue Force Input Data Card Listing
Red Force Input Deck Structure, Figure 1-3
Sample Red Force Input Data Card Listing
Unit Section Card
Initial Mission Card
Artillery Type Card
Reserve Vulnerability Factor Card
Artillery Cannon Type Cards
Artillery Battalion Type Cards
Artillery Intelligence Card
Weapon Description Cards
Maneuver Bn Description Cards
Maneuver Bn Intelligence Cards
Initial Nondivisional Artillery Counts Cards
Army Description Card
Corps Description Card
Blue Division Description Card
Blue Brigade Description Card (1)
Blue Brigade Description Card (2)
Red Division Description Card
Red Regiment Description Card
On Hand Equipment Card

Reinforcing Division Arrival Card
Artillery Reinforcing Schedule Card
Logistical Arrival Card
Maintenance Capacity Card
Unit Section Error Message/Diagnostics Description

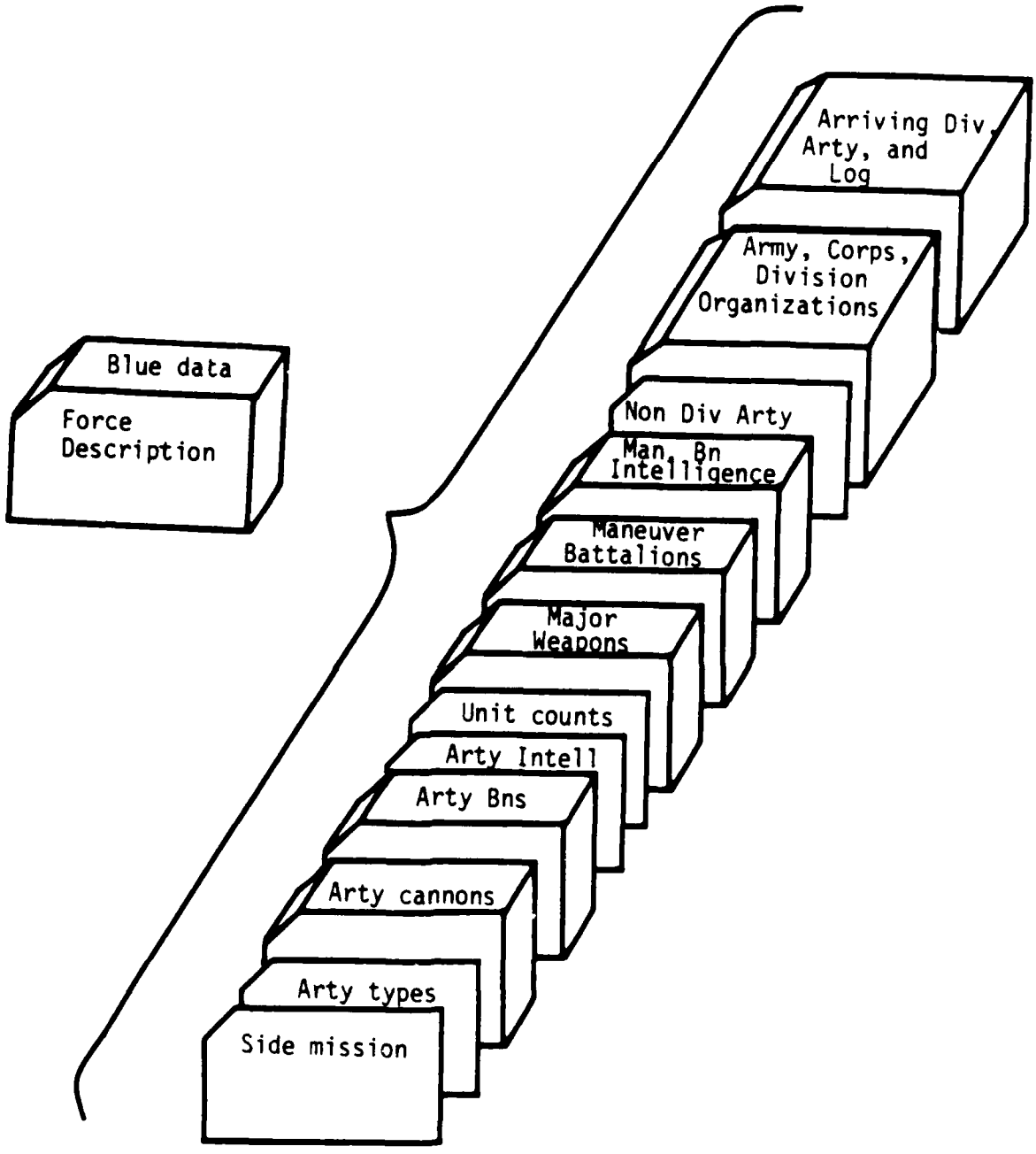
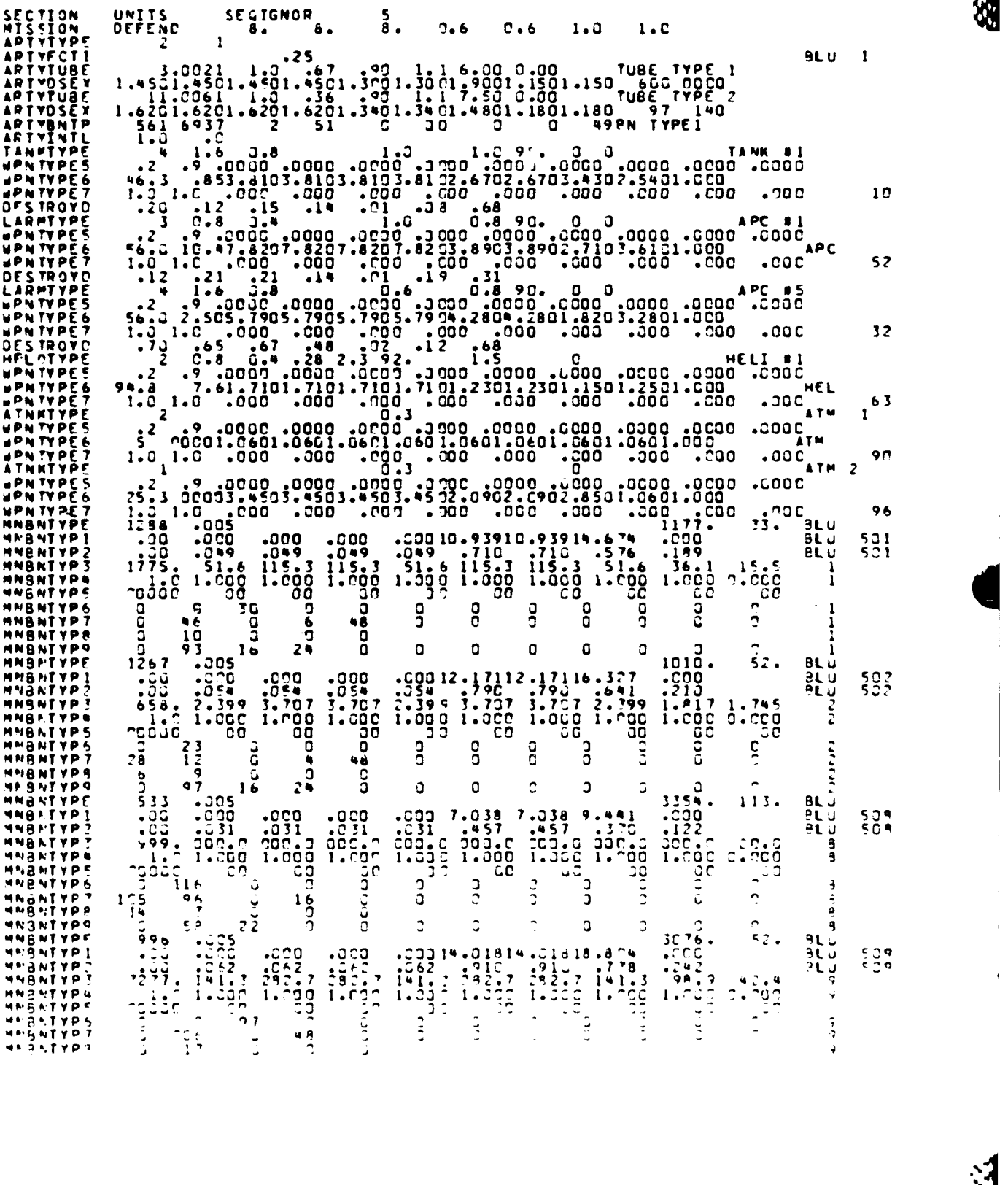
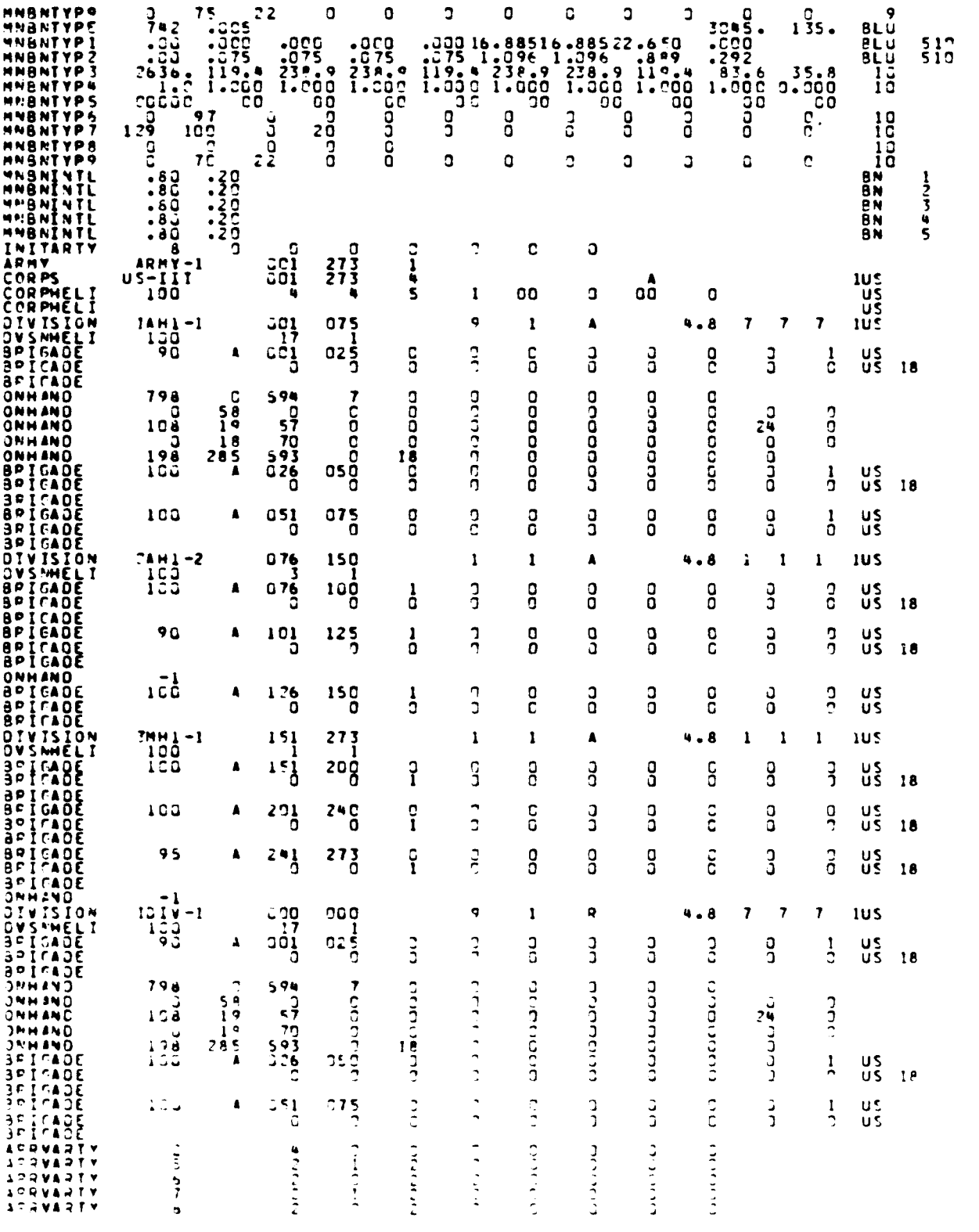
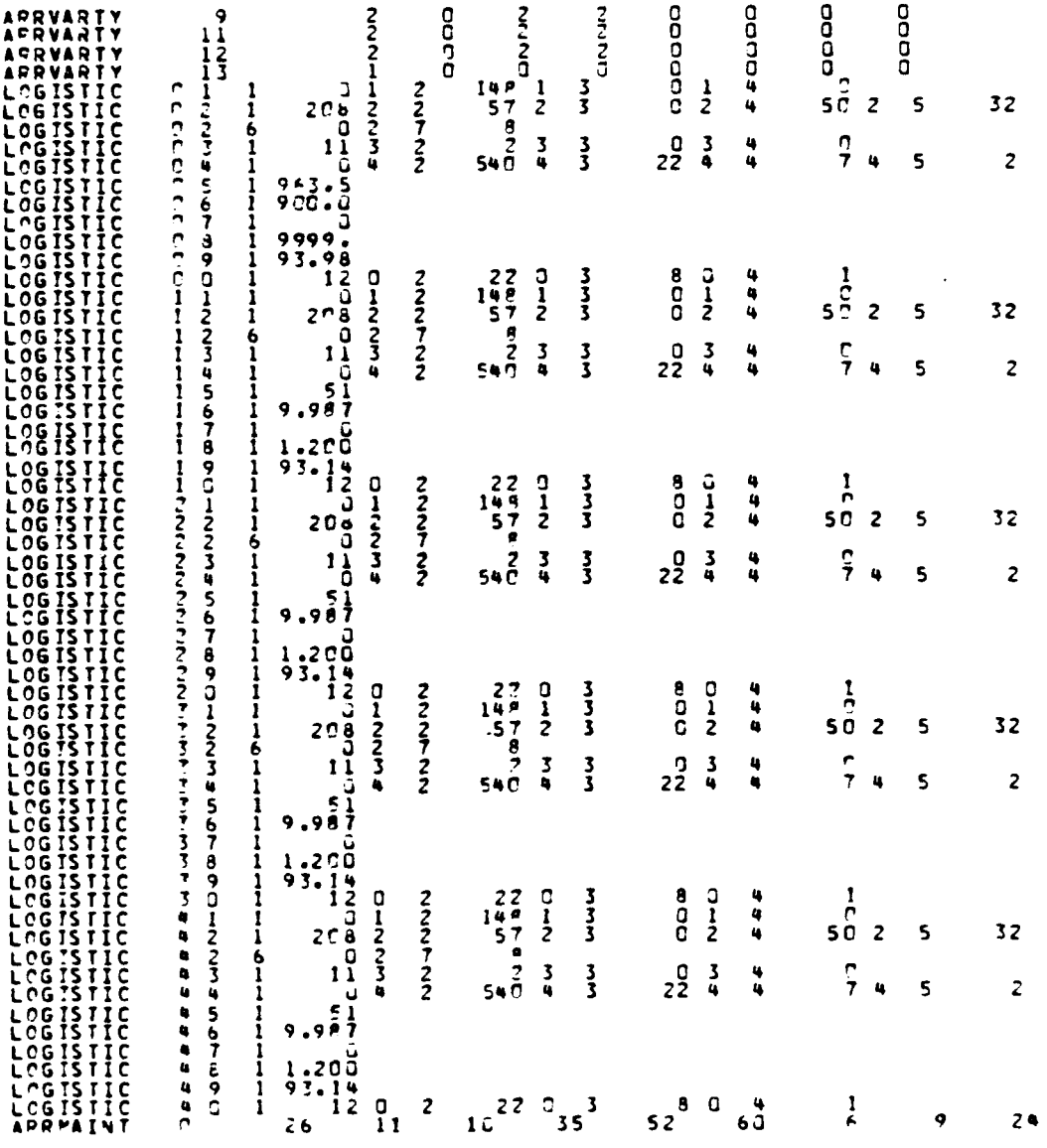


Figure 1-2. Blue Force Input Deck Structure







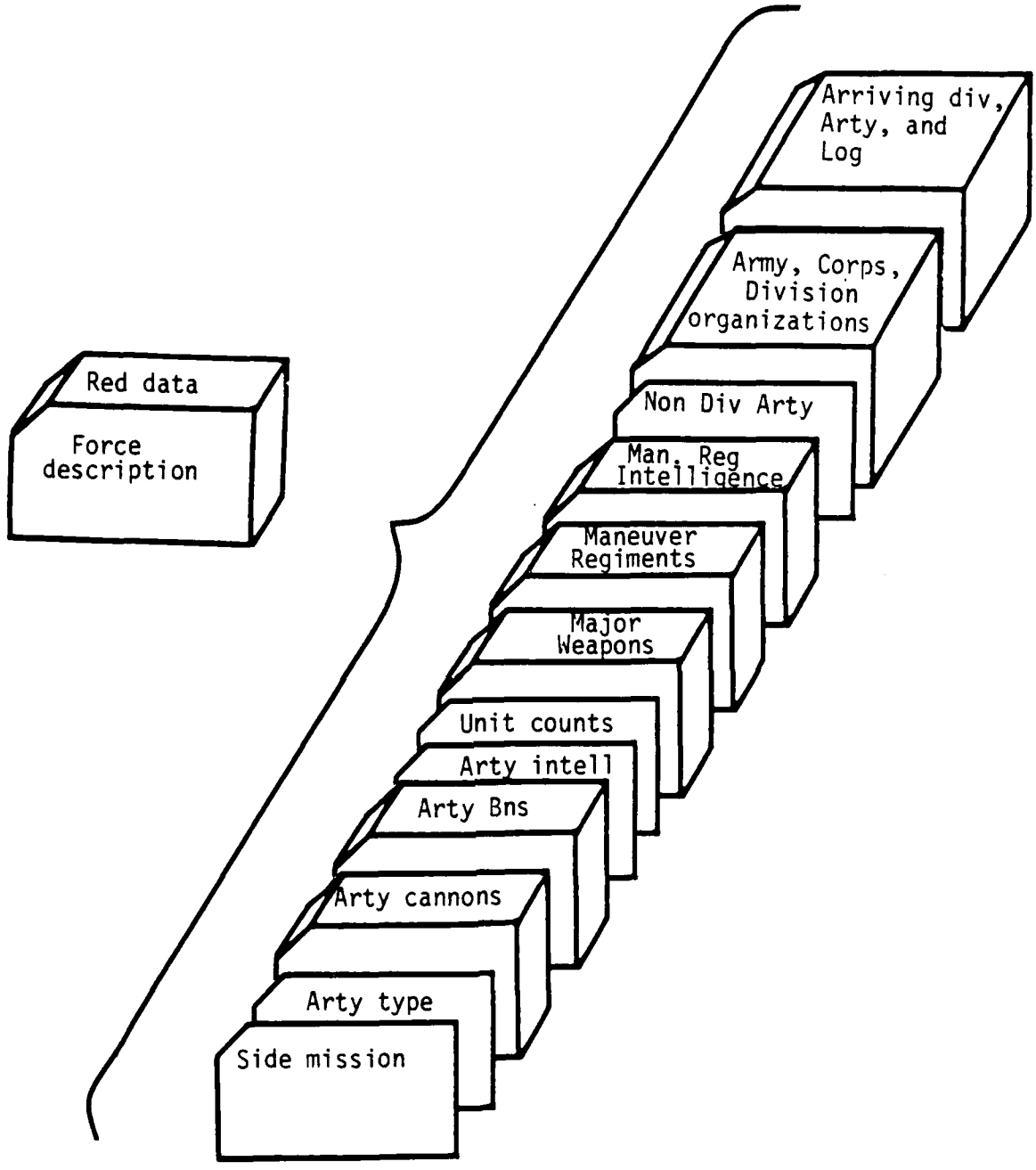
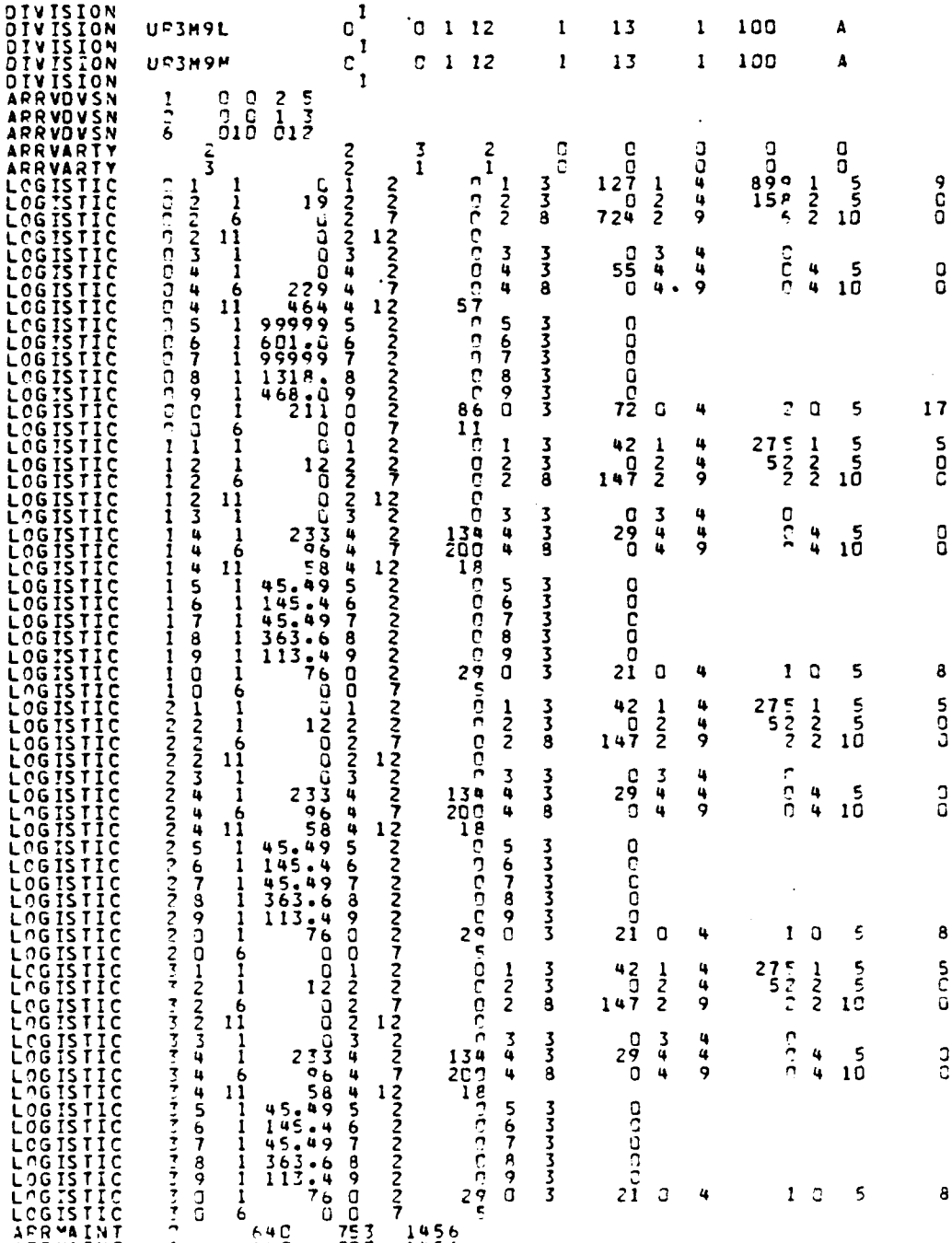


Figure 1-3. Red Force Input Deck Structure

```
MISSION    ATTACK      8.     8.     8.    0.6    0.6    0.8    0.4
ARTYTYPE      4     2
ARTYFCTI                  .25                                                  RED  1
ARTYTUBE      8.0016  1.0    .3   .90   1.1 1.00 1.00              TUBE1
ARTYDSEX   1.4001.4001.4001.4001.2501.2501.2401.1201.120     48 0000
ARTYTUBE      6.0277  1.0    .5   .90   1.1 6.50 1.00              TUBE2
ARTYDSEX   1.4001.4001,4001.4001.2501.2501.2401.1201.120    135 0000
ARTYBNTP    405661907    2    36     3   384     0     0     0 ARTY BN 1
ARTYBNTP    216 6783     7    36     0    00     0     0     0 ARTY BN 2
ARTYBNTP    96011840     3    96     0     0     0     0     0 ARTY BN 3
ARTYBNTP    864 2001     1   108     0    00     0     0     0 ARTY BN 4
ARTYINTL    1.0    .0
TANKTYPE      3  1.6    .8          1.0       0.6 98.  2  3   4 TANK 1
WPNTYPE5     .2   .9 .0000 .0000 .0000 .0000 .0000 .0000 .0000 .0000 .0000
WPNTYPE6     50   1.44.0204.0204.0204.0204.3204.3205.7503.4400.100
WPNTYPE7
DESTROYD    .60   .68   .61   .64   .01   .24   .68
LARMTYPE      3  1.2    .6          0.6       0.6 98.  2 05 00 TYPE 1 LARM
WPNTYPE5     .2   .9 .0000 .0000 .0000 .0000 .0000 .0000 .0000 .0000 .0000
WPNTYPE6   15.8   .285.7905.7905.7905.7904.2804.2801.8203.2800.100
WPNTYPE7
DESTROYD    .75   .70   .70   .64   .01   .44   .68
LARMTYPE      3  1.2    .6          0.6       0.6 98. 00 00 00 TYPE 2 LARM
WPNTYPE5     .2   .9 .0000 .0000 .0000 .0000 .0000 .0000 .0000 .0000 .0000
WPNTYPE6  40.78 2.055.7905.7905.7905.7904.2804.2801.8203.2800.100
WPNTYPE7
DESTROYD    .75   .70   .70   .64   .01   .44   .68
HELOTYPE      4  0.8   0.4  .28 2.3 92.0.00 1.5      00 00 00 HELI 1
WPNTYPE5     .2   .9 .0000 .0000 .0000 .0000 .0000 .0000 .0000 .0000 .0000
WPNTYPE6  66.00   9.91.7701.7701.7701.7701.2801.2801.1601.3000.100          HEL
WPNTYPE7
ATNKTYPE      3                     0.3                00 00 00 ATM 1
WPNTYPE5     .2   .9 .0000 .0000 .0000 .0000 .0000 .0000 .0000 .0000 .0000
WPNTYPE6   24.9 00001.6701.6701.6701.6701.3301.3301.5101.1000.100
WPNTYPE7
ATNKTYPE      2                     0.3                00 00 00 ATM 2
WPNTYPE5     .2   .9 .0000 .0000 .0000 .0000 .0000 .0000 .0000 .0000 .0000
WPNTYPE6  88.18 00001.6701.6701.6701.6701.3301.3301.5101.1000.100
WPNTYPE7
MNBNTYPE   3257   .005                                      5257. 1712.  RED
MNBNTYP1    .00 1.395 1.395 1.395   .000    .000    .000    .000   .000    RED   551
MNBNTYP2    .00   .521   .521   .521   .104    .104    .104    .000 1.123    RED   551
MNBNTYP3   1000.00000000000000000000000000000000000000000000000000000000000     1
MNBNTYP4      1.0 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 0.000        1
MNBNTYP5                                                                        1
MNBNTYP6   328     0     0     0     0     0     0     0     0     0     0     0   1
MNBNTYP7     0     0    29    26     0     0     9     0     9     0    36     0   1
MNBNTYP8     8     8     8     0     0     0     0     0     0     0     0     0   1
MNBNTYP9     0     0     9     0     0     0    27     0     0     0     0     0   1
MNBNTYPE   7204   .005                                      6077. 1770.  RED
MNBNTYP1    .00 1.372 1.372 1.372   .003    .000    .000    .000   .000    RED   552
MNBNTYP2    .00   .512   .512   .512   .102    .102    .102    .000 1.105    RED   552
MNBNTYP3   1000.00000000000000000000000000000000000000000000000000000000000     2
MNBNTYP4      1.0 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 0.000        2
MNBNTYP5                                                                        2
MNBNTYP6   378     0     0     0     0     0     0     0     0     0     0     0   2
MNBNTYP7   217     0    29    26     0     0     9     0     9     0    40     0   2
MNBNTYP8     0     0     0     0     0     0     0     0     0     0     0     0   2
MNBNTYP9     0     0     9     0     0     0    27     0     0     0     0     0   2
MNBNTYPE   3070   .005                                      6757. 1931.  RED
MNBNTYP1    .00 1.315 1.315 1.315   .000    .000    .000    .000   .000    RED   553
MNBNTYP2    .00   .491   .491   .491   .098    .098    .098    .000 1.059    RED   553
MNBNTYP3   1000.00000000000000000000000000000000000000000000000000000000000     3
MNBNTYP4      1.0 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 0.000        3
MNBNTYP5                                                                        3
MNBNTYP6   255    64     0     0     0     0     0     0     0     0     0     0   3
MNBNTYP7   154    90    29    23     0     0     9     0     9     0    40     0   3
MNBNTYP8     0     0     0     0     0     0     0     0     0     0     0     0   3
MNBNTYP9     0     0     4     0     0    27     0     0     0     0     0     0   3
MNBNINTL     .8    .2                                                          1
MNBNINTL     .8    .2                                                          2
MNBNINTL     .8    .2                                                          3
INITARTY      4     3     5     0     0     0     0     0
ARMY       FRONT-1      001   056     2
CORPS      ARMY 1-1     001   056     2                      A
DIVISION   UPITZF       001   028  1   7      1    14     1  100     A
DIVISION              1                      1
DIVISION   UPITZF       029   056  1   7      1    14     1  100     A
DIVISION              1                      1
CORPS      ARMY 1-2       0     0     2                      9
DIVISION   UPITZI       000   000  1   7      1    14     1  100     A
```

DIVISION										
DIVISION	UP1T2J	000	000	1	7	1	14	1	100	A
DIVISION										
ARMY	FRONT-2	057	273		3					
CORPS	ARMY 2-1A	057	100		3				A	
DIVISION	GC1M3A	057	077	1	5	1	6	1	100	A
DIVISION										
DIVISION	GC1M3B	078	100	1	5	1	6	1	100	A
DIVISION										
DIVISION	GC1T3C	000	000	1	4	1	6	1	100	R
DIVISION										
CORPS	ARMY 2-1B	101	200		3				A	
DIVISION	GC1M3A	101	150	1	5	1	6	1	100	A
DIVISION										
DIVISION	GC1M3A	151	200	1	5	1	6	1	100	A
DIVISION										
DIVISION	GC1M3A	0	0	1	5	1	6	1	100	R
DIVISION										
CORPS	ARMY 2-2	0	0		4				R	
DIVISION	UP1T3D	000	000	1	7	1	14	1	100	A
DIVISION										
DIVISION	UP1T3E	000	000	1	7	1	14	1	100	A
DIVISION										
DIVISION	UP1M3F	000	000	1	10	1	14	1	100	A
DIVISION										
DIVISION	UP1M3G	000	000	1	10	1	14	1	100	A
DIVISION										
DIVISION	UP3M5D	0	0	1	12	1	13	1	100	A
DIVISION										
DIVISION	UR3M5H	0	0	1	12	1	13	1	100	A
DIVISION										
DIVISION	UP2T1K	0	0	1	8	1	14	1	100	A
DIVISION										
DIVISION	UR3T1L	0	0	1	9	1	14	1	100	A
DIVISION										
DIVISION	UR3T2O	0	0	1	9	1	14	1	100	A
DIVISION										
DIVISION	UR3T2P	0	0	1	9	1	14	1	100	A
DIVISION										
DIVISION	UR3T2Q	0	0	1	9	1	14	1	100	A
DIVISION										
DIVISION	UR3T7O	0	0	1	9	1	14	1	100	A
DIVISION										
DIVISION	UR3T7P	0	0	1	9	1	14	1	100	A
DIVISION										
DIVISION	UR3T1S	0	0	1	9	1	14	1	100	A
DIVISION										
DIVISION	UR3T6H	0	0	1	9	1	14	1	100	A
DIVISION										
DIVISION	UR3TQA	0	0	1	9	1	14	1	100	A
DIVISION										
DIVISION	UP3TQB	0	0	1	9	1	14	1	100	A
DIVISION										
DIVISION	UR3TQC	0	0	1	9	1	14	1	100	A
DIVISION										
DIVISION	UP3M0I	0	0	1	12	1	13	1	100	A
DIVISION										
DIVISION	UP3M0J	0	0	1	12	1	13	1	100	A
DIVISION										
DIVISION	UP3M0K	0	0	1	12	1	13	1	100	A
DIVISION										
DIVISION	UR3T9E	0	0	1	9	1	14	1	100	A
DIVISION										
DIVISION	UP3M9C	0	0	1	12	1	13	1	100	A
DIVISION										
DIVISION	UP3M9D	0	0	1	12	1	13	1	100	A
DIVISION										
DIVISION	UP1M3F	0	0	1	10	1	14	1	100	A
DIVISION										
DIVISION	UP3M9G	0	0	1	12	1	13	1	100	A
DIVISION										
DIVISION	UP3M9H	0	0	1	12	1	13	1	100	A
DIVISION										
DIVISION	UP3M9I	0	0	1	12	1	13	1	100	A
DIVISION										
DIVISION	UP3M9J	0	0	1	12	1	13	1	100	A
DIVISION										
DIVISION	UP2T1K	0	0	1	8	1	14	1	100	A
DIVISION										
DIVISION	UR3TQC	0	0	1	9	1	14	1	100	A
DIVISION										
DIVISION	UP3M9K	0	0	1	12	1	13	1	100	A



UNITS SECTION CARD

FORMAT 2A4,3X,2A4,2X,2A4,2X,I5,387X,A3,I5

Col 1- 8	"SECTION"
Col 9-10	Blank
Col 11-18	"UNITS"
Col 19-20	Blank
Col 21-28	SEQCOMNT" ignore out of sequence cards, but comment (does not terminate preprocessor) "SEQABORT" abort preprocessor run if out of sequenced cards encountered "SEQIGNOR" ignore and do not comment on out of sequenced cards
Col 29-30	Blank
Col 31-35	Logical input unit for this section of data
Col 36-72	Blank
Col 73-75	Sequence label
Col 76-80	Sequence number

INITIAL MISSION/SUPPLY PARAMETER CARD

FORMAT 2A4,2X,2A4,3F6.0,4F6.3,3F4.2,A3,I5

Col 1- 8	"MISSION"
Col 9-10	Blank
Col 11-18	Initial mission of theater (by side-Blue, then side-Red) "DELAY", "ATTACK" (left justified)
Col 19-24	Supply rationing "n" for POL*
Col 25-30	Supply rationing "n" for AMMO*
Col 31-36	Supply rationing "n" for OTHER*
Col 37-42	Firepower constraint "P" for personnel POL**
Col 43-48	Firepower constraint "Q" for personnel POL**
Col 49-54	Firepower constraint "P" for personnel OTHER**
Col 55-60	Firepower constraint "Q" for personnel OTHER**
Col 61-64	POL availability factor, $\leq$ 1.0***
Col 65-68	AMMO availability factor, $\leq$ 1.0***
Col 69-72	OTHER availability factor, $\leq$ 1.0***
Col 73-75	Sequence label
Col 76-80	Sequence number

---

*Enter whole number with decimal; cannot be less than 1.0.

**Values for "Q" must be greater than zero and less than or equal to one. Values for "P" may range from zero to one. "P" and "Q" for AMMO are hard-wired as zero and one, respectively. See para 5-3c of Volume I for explanation of these factors.

***Applies to Blue only. Example, if Blue is to be restricted to use at most 90 percent of this available supply, then the value should be .90. Designed for use where "P" and "Q" values are "0" and "1," respectively, and n = 1.0. Default = 1.0.

ARTILLERY TYPE/GENERAL SUPPORT (GS) PARTITIONING CARD

FORMAT 2A4,2X,2I5,3F5.2,37X,A3,I5

Col 1- 8	"ARTYTYPE"
Col 9-10	Blank
Col 11-15	Quantity of artillery bn types (1-15)
Col 16-20	Quantity of artillery cannon types (1-8)
Col 21-25	Fraction of nondiv GS arty drawing ammo resupply from Blue partition 1 (e.g., 0.52)*
Col 26-30	Fraction of nondiv GS arty drawing ammo resupply from Blue partition 2*
Col 31-35	Fraction of nondiv GS arty drawing ammo resupply from Blue partition 3*
Col 36-72	Optional comments
Col 73-75	Sequence label
Col 76-80	Sequence number

---

*Fields may be left blank, or 1, 2, or 3 entries may be made. Ammunition drawdown will be from the source partition according to these percentages. Blank causes the model to function in the 1-0-0 mode, i.e., no partitioning.

RESERVE VULNERABILITY FACTOR

(One card required for each side)

FORMAT	2A4,2X,5F5.0,I5,32X,A3,I5
Col 1- 8	"ARTYFCT1"
Col 9-25	Blank
Col 26-30	Factor p, representing the ratio of the area occupied by a Blue brigade or Red division in reserve to the total area over which enemy GS fire would be distributed
Col 31-40	Blank
Col 41-72	Optional comments
Col 73-75	Sequence label
Col 76-80	Sequence number

ARTY CANNON TYPE CARD, Card 1 of 2

(One card required for artillery cannon type)

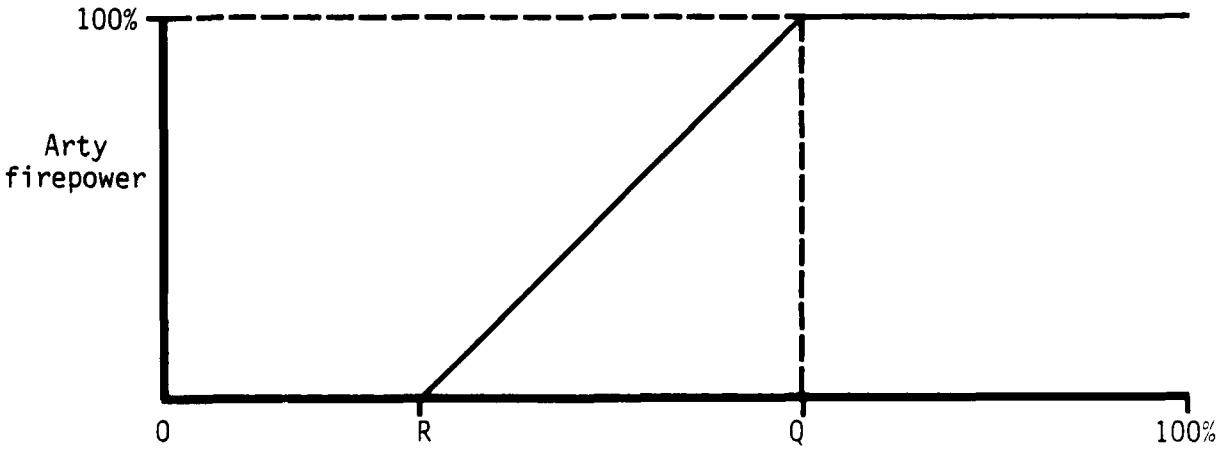
FORMAT 2A4,2X,9F5.0,17X,A3,I5

Col 1- 8	"ARTYTUBE"
Col 9-10	Blank
Col 11-15	Personnel per cannon (normal crew)
Col 16-20	Breakdown rate - nonrepairable at site
Col 21-25	Tube value*
Col 26-30	R constraint - fraction of normal crew personnel below which cannon cannot be effectively employed**
Col 31-35	Q constraint - fraction of normal crew personnel below which cannon firepower becomes less effective**
Col 36-40	Factor to represent increased expenditure for direct support (DS) artillery (see para 6-2a of Volume I)
Col 41-45	Expenditure rate (rounds) of Type 1 ammo vs. reserve units
Col 46-50	Expenditure rate (rounds) of Type 2 ammo vs reserve units
Col 51-72	Optional comments
Col 73-75	Sequence label
Col 76-80	Sequence number

---

*The tube value is used to determine the "combat capability" of artillery battalions.

**Should a shortage of personnel exist within an artillery bn, a constraint on firepower is applied as suggested in the following graph:



ARTY DS AMMO EXPENDITURE CARD, Card 2 of 2

(One card required for each artillery cannon type)

FORMAT 2A4,2X,11F5.0,2X,A3,I5

Col 1- 8	"ARTYDSEX"
Col 9-10	Blank
Col 11-15	Ammo expenditure factor* for Blue attack Delay
Col 16-20	Ammo expenditure factor* for Blue attack Prepared Defense
Col 21-25	Ammo expenditure factor* for Blue attack Hasty Defense
Col 26-30	Ammo expenditure factor* for Meeting Engagement
Col 31-35	Ammo expenditure factor* for Red attack Hasty Defense
Col 36-40	Ammo expenditure factor* for Red attack Prepared Defense
Col 41-45	Ammo expenditure factor* for Red attack Delay
Col 46-50	Ammo expenditure factor* for Static Engagement
Col 51-55	Ammo expenditure factor* for Reserve
Col 56-60	Average round weight (in lbs) of ammo Type 1
Col 61-65	Average round weight (in lbs) of ammo Type 2
Col 66-72	Blank
Col 73-75	Sequence label
Col 76-80	Sequence number

---

*Per division cycle (12 hours). Factor is applied to number of rounds x rounds weight expended in the engagement to determine tons expended.

ARTY BN TYPE CARD

(One card required for each artillery bn type)

FORMAT 2A4,2X,9F5.0,17X,A3,I5

Col 1- 8	"ARTYBNTP"
Col 9-10	Blank
Col 11-15	Total cannon crew personnel authorized for the arty bn
Col 16-20	Total tons of artillery ammo Type 1 in arty bn
Col 21-25	Tube type "X" in arty bn
Col 26-30	Quantity of tube type "X" in arty bn
Col 31-35	Tube type "Y" in arty bn
Col 36-40	Quantity of tube type "Y" in arty bn
Col 41-45	Tube type "Z" in arty bn
Col 46-50	Quantity of tube type "Z" in arty bn
Col 51-55	Total tons of artillery ammo type 2 in arty bn
Col 56-72	Optional comments
Col 73-75	Sequence label
Col 76-80	Sequence number

ARTILLERY INTELLIGENCE CARD

FORMAT 2A4,2X,3F5.0,47X,A3,I5

Col 1- 8	"ARTYINTL"
Col 9-10	Blank
Col 11-15	This entry is for estimating DS artillery firepower. The "a" coefficient in Col 11-15 (see detailed write-up on intelligence equation, para 6-2d in Volume I)
Col 16-20	The "b" coefficient
Col 21-25	The "c" coefficient
Col 26-72	Blank
Col 73-75	Sequence label
Col 76-80	Sequence number

Note:

These entries, a, b, and c, represent the enemy's ability to detect and estimate the amount of effective artillery firepower in direct support. The sum of a, b, and c is not required to be 1; but a warning is issued if the sum is not 1.

WEAPON DESCRIPTION (Tank) CARD

FORMAT 2A4,2X,3F5.0,6F4.2,3(1X,I2),14X,A3,I5

Col 1- 8	"TANKTYPE"
Col 9-10	Blank
Col 11-15	Quantity of personnel in crew
Col 16-20	Quantity of casualties to crew, given a kill
Col 21-25	Quantity of crew casualties wounded, given a kill*
Col 26-33	Not used
Col 34-37	Weapon value**
Col 38-41	Level (fraction of authorized) to which temporary losses will be replaced (Blue only)
Col 42-45	Breakdowns per 100 weapons engaged
Col 46-49	Percent of breakdowns repairable***
Col 50-52	Type number of tank preferred as a substitute for this tank type
Col 53-55	Type number of tank, second priority, as a substitute for this tank type
Col 56-58	Type number of tank, third priority, as a substitute for this tank type
Col 59-72	Optional comments
Col 73-75	Sequence label
Col 76-80	Sequence number

*Crew KIA equals total crew casualties minus crew casualties wounded.

**The weapon values are used to determine "combat capability" of units. See Volume 1, paragraph 1-9e, for how these values are used.

***All other breakdowns are nonrepairable and are counted as permanent losses. Example of entry, 95., not .95 or 95

NOTE:

See para 5-4k of Volume I for algorithm employing the above damage factors.

WEAPON DESCRIPTION (Light Armor) CARD

FORMAT 2A4,2X,3F5.0,6F4.2,3(1X,I2),14X,A3,I5

Col 1- 8	"LARMTYPE"
Col 9-10	Blank
Col 11-15	Quantity of personnel in crew
Col 16-20	Quantity of casualties to crew, given a kill
Col 21-25	Quantity of crew casualties wounded, given a kill*
Col 26-33	Blank
Col 34-37	Weapon value
Col 38-41	Fraction of authorized to which temporary losses will be replaced (Blue only)
Col 42-45	Breakdowns per 100 weapons engaged
Col 46-49	Percent of breakdowns repairable**
Col 50-52	Type number of light armor weapon preferred as a substitute for this light armor type
Col 53-55	Type number of light armor weapon, second priority, as a substitute for this light armor type
Col 56-58	Type number of light armor weapon, third priority, as a substitute for this light armor type
Col 59-72	Optional comments
Col 73-75	Sequence label
Col 76-80	Sequence number

---

*Crew KIA equals total crew casualties minus crew casualties wounded.

**All other breakdowns are nonrepairable and are counted as permanent losses. Example of entry, 95., not .95 or 95

Note:

See para 5-4k of Volume I for algorithm employing the above damage factors.

WEAPON DESCRIPTION (Helicopter) CARD

FORMAT 2A4,2X,3F5.0,5F4.2,4X,3(1X,I2),14X,A3,I5

Col 1- 8	"HELOTYPE"
Col 9-10	Blank
Col 11-15	Quantity of personnel in crew
Col 16-20	Quantity of casualties to crew, given a kill
Col 21-25	Quantity of crew casualties wounded, given a kill
Col 26-29	Fraction of helicopters downed that may be retrievable
Col 30-33	Breakdown rate/100 weapons
Col 34-37	Percent of breakdowns repairable
Col 38-41	Fraction of authorized to which temporary losses will be replaced (Blue only)
Col 42-45	Weapon value
Col 46-49	Blank
Col 50-52	Type number of helicopter preferred as a substitute for this helicopter type
Col 53-55	Type number of helicopter, second priority, as a substitute for this helicopter type
Col 56-58	Type number of helicopter, third priority, as a substitute for this helicopter type
Col 59-72	Optional comments
Col 73-75	Sequence label
Col 76-80	Sequence number

WEAPON DESCRIPTION (Antitank, Mortar) CARD

FORMAT 2A4,2X,3F5.0,6F4.2,3(1X,I2),14X,A3,I5

Col 1- 8	"ATNKTYPE"
Col 9-10	Blank
Col 11-15	Quantity of personnel in crew*
Col 16-33	Not used
Col 34-37	Weapon value
Col 50-52	Type number of AT/M preferred as a substitute for this AT/M type
Col 53-55	Type number of AT/M, second priority, as a substitute for this AT/M type
Col 56-58	Type number of AT/M, third priority, as a substitute for this AT/M type
Col 59-72	Blank
Col 73-75	Sequence label
Col 76-80	Sequence number

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*In order for a replacement AT/M weapon to be issued to a unit, sufficient personnel must be present in the unit's status file to provide crews for the replacement weapons.

WEAPON DESCRIPTION (POL Rqmts) CARD

FORMAT 2A4,2X,2F4.2,9F6.2,A3,I5

Col 1- 8	"WPNTYPE5"
Col 9-10	Blank
Col 11-14	POL "P" modifier for rationing POL, if required
Col 15-18	POL "Q" modifier for rationing POL, if required
Col 19-24	POL requirements (in tons)* for BAD
Col 25-30	POL requirements (in tons)* for BAPD
Col 31-36	POL requirements (in tons)* for BAHD
Col 37-42	POL requirements (in tons)* for ME
Col 43-48	POL requirements (in tons)* for RAHD
Col 49-54	POL requirements (in tons)* for RAPD
Col 55-60	POL requirements (in tons)* for RAD
Col 61-66	POL requirements (in tons)* for QUIET
Col 67-72	POL requirements (in tons)* for RESERVE
Col 73-75	Sequence label
Col 76-80	Sequence number

*Per division cycle (12 hours).

WEAPON DESCRIPTION (Ammo Rqmts) CARD

FORMAT 2A4,2X,12F5.0,2X,A3,I5

Col 1- 8	"WPNTYPE6"
Col 9-10	Blank
Col 11-15	Average weight (in lbs) of one round of ammo type 1
Col 16-20	Average weight (in lbs) of one round of ammo type 2
Col 21-25	Ammo expenditure factor* for BAD
Col 26-30	Ammo expenditure factor* for BAPD
Col 31-35	Ammo expenditure factor* for BAHD
Col 36-40	Ammo expenditure factor* for ME
Col 41-45	Ammo expenditure factor* for RAHD
Col 46-50	Ammo expenditure factor* for RAPD
Col 51-55	Ammo expenditure factor* for RAD
Col 56-60	Ammo expenditure factor* for QUIET
Col 61-65	Ammo requirements (in tons)* for RESERVE ammo type 1
Col 66-70	Ammo requirements (in tons)* for Ammo 2 for RESERVE
Col 71-72	Blank
Col 73-75	Sequence label
Col 76-80	Sequence number

*Per division cycle (12 hours).

WEAPON DESCRIPTION (Other Supply Rqmts) CARD

FORMAT 2A4,2X,2F4.2,9F6.2,A3,I5

Col 1- 8	"WPNTYPE7"
Col 9-10	Blank
Col 11-14	OTHER SUPPLY "P" modifier for rationing OTHER SUPPLY, if required
Col 15-18	OTHER SUPPLY "Q" modifier for rationing OTHER SUPPLY, if required
Col 19-24	OTHER SUPPLY requirement (in tons)* for BAD
Col 25-30	OTHER SUPPLY requirement (in tons)* for BAPD
Col 31-36	OTHER SUPPLY requirement (in tons)* for BAHD
Col 37-42	OTHER SUPPLY requirement (in tons)* for ME
Col 43-48	OTHER SUPPLY requirement (in tons)* for RAHD
Col 49-54	OTHER SUPPLY requirement (in tons)* for RAPD
Col 55-60	OTHER SUPPLY requirement (in tons)* for RAD
Col 61-66	OTHER SUPPLY requirement (in tons)* for QUIET
Col 67-72	OTHER SUPPLY requirement (in tons)* for RESERVE
Col 73-75	Sequence label
Col 76-80	Sequence number

*Per division cycle (12 hours).

DESTROYED WEAPONS CARD

FORMAT 2A4,2X,7F5.0,2X,A3,I5

Col 1- 8	"DESTROYD"
Col 9-10	Blank
Col 11-15	Fraction of the weapons hit by tanks which are totally destroyed
Col 16-20	Fraction of the weapons hit by light armor which are totally destroyed
Col 21-25	Fraction of the weapons hit by helicopters which are totally destroyed
Col 26-30	Fraction of the weapons hit by AT/M which are totally destroyed
Col 31-35	Fraction of the weapons hit by personnel which are totally destroyed
Col 36-40	Fraction of the weapons hit by artillery which are totally destroyed
Col 41-45	Fraction of the weapons hit by CAS which are totally destroyed
Col 46-72	Blank
Col 73-75	Sequence label
Col 76-80	Sequence number

MANEUVER BN TYPE DEFINITION CARD

FORMAT 2A4,2X,2F6.1,37X,2F6.1,2X,A3,I5

Col 1- 8	"MNBNTYPE"
Col 9-10	Blank
Col 11-16	Quantity of personnel (not weapon crews) assigned to this type bn
Col 17-22	MNBN personnel value (value per person)
Col 23-58	Blank
Col 59-64	Total tons of ammo type 1 in maneuver bn
Col 65-70	Total tons of ammo type 2 in maneuver bn
Col 71-72	Blank
Col 73-75	Sequence label
Col 76-80	Sequence number

Note:

This card and the next nine cards define a maneuver bn type. A 10-card deck must be submitted for each maneuver by type required.

MANEUVER BN TYPE DEFINITION CARD

FORMAT	2A4,2X,F5.0,7F6.2,15X,A3,I5
Col 1- 8	"MNBNTYP1"
Col 9-10	Blank
Col 11-15	Personnel shortage factor "Q" (full effectiveness fraction for AT/M wpns)*
Col 16-57	Blank
Col 58-72	Optional comments
Col 73-75	Sequence label
Col 76-80	Sequence number

*Should a shortage of personnel exist within the noncrew personnel pool of the maneuver unit status file, a constraint on AT/M effectiveness is applied.

MANEUVER BN TYPE DEFINITION CARD

FORMAT 2A4,2X,F5.0,7F6.2,15X,A3,I5

Col 1- 8	"MNBNTYP2"
Col 9-10	Blank
Col 11-15	Personnel shortage factor "R" (zero effectiveness fraction for AT/M wpns)*
Col 16-57	Blank
Col 58-72	Optional comments
Col 73-75	Sequence label
Col 76-80	Sequence number

*See MNBNTYP1 card for explanation.

MANEUVER BN TYPE DEFINITION CARD

(POL On Hand and Consumption by Personnel)

FORMAT 2A4,2X,10F6.2,2X,A3,I5

Col 1- 8	"MNBNTYP3"
Col 9-10	Blank
Col 11-16	Tons of POL on hand for this maneuver bn type for total bn use
Col 17-22	Tons of POL requirement for BAD per division cycle*
Col 23-28	Tons of POL requirement for BAPD per division cycle*
Col 29-34	Tons of POL requirement for BAHD per division cycle*
Col 35-40	Tons of POL requirement for ME per division cycle*
Col 41-46	Tons of POL requirement for RAHD per division cycle*
Col 47-52	Tons of POL requirement for RAPD per division cycle*
Col 53-58	Tons of POL requirement for RAD per division cycle*
Col 59-64	Tons of POL requirement for QUIET per division cycle*
Col 65-70	Tons of POL requirement for RESERVE per division cycle*
Col 71-72	Blank
Col 73-75	Sequence label
Col 76-80	Sequence number

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*Total bn requirement except for weapons defined on WPNTYPE5 cards. The CEM preprocessor divides this figure by personnel on MNBNTYPE card to arrive at POL requirement/man for brigade consumption calculations.

MANEUVER BN TYPE DEFINITION CARD

(AMMO On Hand and Consumption by Personnel)

FORMAT 2A4,2X,10F6.2,2X,A3,I5

Col 1- 8	"MNBNTYP4"
Col 9-10	Blank
Col 11-16	Average wt (lbs) of ammo type 2 expended by bn pers
Col 17-22	AMMO factor for BAD per division cycle
Col 23-28	AMMO factor for BAPD per division cycle
Col 29-34	AMMO factor for BAHD per division cycle
Col 35-40	AMMO factor for ME per division cycle
Col 41-46	AMMO factor for RAHD per division cycle
Col 47-52	AMMO factor for RAPD per division cycle
Col 53-58	AMMO factor for RAD per division cycle
Col 59-64	AMMO factor for QUIET per division cycle
Col 65-70	Tons of AMMO requirement for RESERVE per division cycle*
Col 71-72	Blank
Col 73-75	Sequence label
Col 76-80	Sequence number

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*Total bn requirement except for weapons defined on WPNTYPE6 cards. The CEM preprocessor divides this figure by personnel on MNBNTYPE card at AMMO requirement/man for bde consumption calculations.

MANEUVER BN TYPE DEFINITION CARD

(OTHER SUPPLIES On Hand and Consumption by Personnel)

FORMAT 2A4,2X,10F6.2,2X,A3,I5

Col 1- 8	"MNBNTYP5"
Col 9-10	Blank
Col 11-16	Tons of OTHER SUPPLIES on hand for this maneuver bn type
Col 17-22	Tons of OTHER SUPPLIES requirement for BAD per division cycle*
Col 23-28	Tons of OTHER SUPPLIES requirement for BAPD per division cycle*
Col 29-34	Tons of OTHER SUPPLIES requirement for BAHD per division cycle*
Col 35-40	Tons of OTHER SUPPLIES requirement for ME per division cycle*
Col 41-46	Tons of OTHER SUPPLIES requirement for RAHD per division cycle*
Col 47-52	Tons of OTHER SUPPLIES requirement for RAPD per division cycle*
Col 53-58	Tons of OTHER SUPPLIES requirement for RAD per division cycle*
Col 59-64	Tons of OTHER SUPPLIES requirement for QUIET per division cycle*
Col 65-70	Tons of OTHER SUPPLIES requirement for RESERVE per division cycle*
Col 71-72	Blank
Col 73-75	Sequence label
Col 76-80	Sequence number

---

*Total bn requirement except for weapons defined on WPNTYPE7 cards. The CEM preprocessor divides this figure by personnel on MNBNTYPE card at OTHER SUPPLY requirement/man for bde consumption calculations.

MANEUVER BN TYPE DEFINITION CARD

(TANKS Assigned to Bn)

FORMAT 2A4,12(2X,F3.0),4X,A3,I5

Col 1- 8	"MNBNTYP6"
Col 9-10	Blank
Col 11-13	Quantity of type 1 tanks
Col 14-15	Blank
Col 16-18	Quantity of type 2 tanks
Col 19-20	Blank
Col 21-23	Quantity of type 3 tanks
Col 24-25	Blank
Col 26-28	Quantity of type 4 tanks

This cycle (2 columns blank followed by 3 columns for quantity of tank) continues through card column 66-68 which is quantity of type 12 tanks. Previous to this, the user must have specified data entries in weapon description for each weapon specified in a maneuver bn.

Col 69-72	Optional comments
Col 73-75	Sequence label
Col 76-80	Sequence number

MANEUVER BN TYPE DEFINITION CARD

(LIGHT ARMOR Assigned to Bn)

FORMAT 2A4,12(2X,F3.0),4X,A3,I5

Col 1- 8	"MNBNTYP7"
Col 9-10	Blank
Col 11-13	Quantity of type 1 light armor
Col 14-15	Blank
Col 16-18	Quantity of type 2 light armor
Col 19-20	Blank
Col 21-23	Quantity of type 3 light armor
Col 24-25	Blank
Col 26-28	Quantity of type 4 light armor
	This cycle (2 columns blank followed by 3 columns for quantity of light armor weapons) continues through card column 66-68 which is quantity of type 12 light armor assigned to this bn.
Col 69-72	Optional comments
Col 73-75	Sequence label
Col 76-80	Sequence number

Note:

Previously, the user must have specified data entries in weapon description for each weapon type specified in a maneuver bn.

MANEUVER BN TYPE DEFINITION CARD

(HELICOPTERS Assigned to Bn)

FORMAT 2A4,12(2X,F3.0),4X,A3,I5

Col 1- 8	"MNBNTYP8"
Col 9-10	Blank
Col 11-13	Quantity of type 1 helicopters*
Col 14-15	Blank
Col 16-18	Quantity of type 2 helicopters
Col 19-20	Blank
Col 21-23	Quantity of type 3 helicopters
Col 24-25	Blank
Col 26-28	Quantity of type 4 helicopters
Col 29-30	Blank
Col 31-33	Quantity of type 5 helicopters
Col 34-68	Blank
Col 69-72	Optional comments
Col 73-75	Sequence label
Col 76-80	Sequence number

*There is a maximum of five (5) helicopter types for each force.

MANEUVER BN TYPE DEFINITION CARD

(ANTITANK WEAPONS Assigned to Bn)

FORMAT 2A4,12(2X,F3.0),4X,A3,I5

Col 1- 8	"MNBNTYP9"
Col 9-10	Blank
Col 11-13	Quantity of type 1 antitank/mortar weapons
Col 14-15	Blank
Col 16-18	Quantity of type 2 antitank/mortar weapons
	This cycle (2 columns blank followed by 3 columns for quantity of antitank/mortars) continues through card column 66-68 which is quantity of type 12 antitank/mortar weapons assigned to this bn.
Col 69-72	Optional comments
Col 73-75	Sequence label
Col 76-80	Sequence number

Note:

The user must have previously specified data in weapon description for each type specified in a maneuver bn.

MANEUVER BN INTELLIGENCE CARD

FORMAT 2A4,2X,3F5.0,47X,A3,I5

Col 1- 8	"MNBNINTL"
Col 9-10	Blank
Col 11-15	The coefficient "a"
Col 16-20	The coefficient "b"
Col 21-72	Blank
Col 73-75	Sequence label
Col 76-80	Sequence number

Notes:

See para 6-2d of Volume I for explanation of these coefficients. Note the effect when the TOS switch is on (designed on "TOS Options" card in Run section). The sum of a and b is not required to be 1; however, a warning is issued if their sum is not equal to 1.0.

One card is required for each type of maneuver bn specified on the "COUNTS" card, and the coefficients represent the capability of the enemy in detecting the presence of each particular type of battalion.

INITIAL NONDIVISIONAL ARTILLERY COUNTS CARD

FORMAT 2A4,2X,8I5,22X,A4,I5

Col 1- 8	"INITARTY"
Col 9-10	Blank
Col 11-15	Initial count of nondivisional artillery bn of type 1
Col 16-20	Initial count of nondivisional artillery bn of type 2
Col 21-25	Initial count of nondivisional artillery bn of type 3
Col 26-30	Initial count of nondivisional artillery bn of type 4
Col 31-35	Initial count of nondivisional artillery bn of type 5
Col 36-40	Initial count of nondivisional artillery bn of type 6
Col 41-45	Initial count of nondivisional artillery bn of type 7
Col 46-50	Initial count of nondivisional artillery bn of type 8
Col 51-72	Optional comments
Col 73-75	Sequence label
Col 76-80	Sequence number

Note:

This is GS artillery assigned initially to the theater (nondivisional). Divisional GS/DS artillery is assigned on the "DIVISION" card.

ARMY DESCRIPTION CARD

FORMAT 2A4,2X,2A4,2X,3I5,5X,I10,22X,A3,I5

Col 1- 8	"ARMY"
Col 9-10	Blank
Col 11-18	Army name (user assigned - up to 8 characters)
Col 19-20	Blank
Col 21-25	Low minisector boundary (frontage coordinate - north)
Col 26-30	High minisector boundary (frontage coordinate - south)
Col 31-35	Quantity of subordinate corps assigned to this army HQ $\geq 1, \leq 5$
Col 36-50	Blank
Col 51-72	Optional comments
Col 73-75	Sequence label
Col 76-80	Sequence number

Note:

The "COUNT" card has specified the quantity of armies to be defined.

CORPS DESCRIPTION CARD

FORMAT 2A4,2X,2A4,2X,3I5,5X,I10,1X,A4,16X,I1,A3,I5

Col 1- 8	"CORPS"
Col 9-10	Blank
Col 11-18	Corps name (user assigned - 8 characters)
Col 19-20	Blank
Col 21-25	Low minisector boundary (frontage coordinate - north)
Col 26-30	High minisector boundary (frontage coordinate - south)
Col 31-35	Quantity subordinate divisions assigned to this corps*
Col 36-54	Blank
Col 55	Status of this corps: A = Active R = Reserve
Col 56-71	Optional comments
Col 72	Partition for resupply of corps cavalry (1, 2, or 3); zero or blank defaults to 1
Col 73-75	Sequence label
Col 76-80	Sequence number

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*Quantity of subordinate divisions, $> 0 \leq 5$.

CORPS CAV UNIT CARD

(Blue corps only)

FORMAT 2A4,2X,I5,5X,10I5,2X,A3,I5

Col 1- 8	"CORPHELI"
Col 9-10	Blank
Col 11-15	Initial strength
Col 16-20	Blank
Col 21-25	Maneuver bn type (as previously defined in MNBNTYPE"
Col 26-30	Quantity of maneuver bns of type designated in Col 21-25
Col 31-35	Maneuver bn type
Col 36-40	Quantity of maneuver bns of type designated in Col 31-35
Col 41-45	Maneuver bn type
Col 46-50	Quantity of maneuver bns of type designated in Col 41-45
Col 51-55	Maneuver bn type
Col 56-60	Quantity of maneuver bns of type designated in Col 51-55
Col 61-65	Maneuver bn type
Col 66-70	Quantity of maneuver bns of type designated in Col 61-65
Col 71-72	Blank
Col 73-75	Sequence label
Col 76-80	Sequence number

Note:

Initial strength columns 11-15 - this value divided by 100 will be multiplied by each full strength "authorized" load of personnel, POL, AMMO, other supplies, and all weapons to yield the "actual" initial on-hand load. If initial strength is less than 100, an "ONHAND" card input is required.

BLUE DIVISION CARD

FORMAT 2A4,2X,2A4,2X,5I5,1X,A4,4X,56.0?,3I3,2X,I1,A3,I5

Col 1- 8	"DIVISION"
Col 9-10	Blank
Col 11-18	Division name
Col 19-20	Blank
Col 21-25	Low minisector boundary (frontage coordinate - north)
Col 26-30	High minisector boundary (frontage coordinate - south)
Col 31-35	Blank
Col 36-40	Type of GS artillery battalions assigned to division* (Blank or zero implies no arty bn organic to the division)
Col 41-45	Quantity of GS artillery bns assigned to division (max = 5)
Col 46-49	Blank
Col 50	Status of this Blue division: A = Active R = Reserve (reinforcing division must be A)
Col 51-54	Blank
Col 55-60	Blue bde FEBA movement threshold for prepared defense or barrier** (same for each bde within division)
Col 61-63	1st brigade DS artillery battalion type (0-15)***
Col 64-66	2d brigade DS artillery battalion type (0-15)***
Col 67-69	3d brigade DS artillery battalion type (0-15)***
Col 70-71	Blank
Col 72	Partition for this unit (1, 2, or 3); zero or blank defaults to 1****
Col 73-75	Sequence label
Col 76-80	Sequence number

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*Only one type battalion (1-15) of artillery can be in GS mode.

**If FEBA movement exceeds this entry, the defense is considered hasty where the FEBA movement is in hectometers (hm).

***An entry of zero for any brigade means this brigade does not have any DS arty bn assigned to it.

****Partition designation determines which resupply pool this unit will access for replenishment of personnel, maneuver bn ammo, POL, other supplies, and arty ammo.

Note:

Blue division always has three brigades.

DIVISION CAV UNIT CARD

(Blue Division only)

FORMAT 2A4,2X,I5,5X,10I5,2X,A3,I5

Col 1- 8	"DVSNHELI"
Col 9-10	Blank
Col 11-15	Initial strength
Col 16-20	Blank
Col 21-25	Maneuver bn type (as previously defined in "MNBNTYPE")
Col 26-30	Quantity of maneuver bns of type designated in Col 21-25
Col 31-35	Maneuver bn type
Col 36-40	Quantity of maneuver bns of type designated in Col 31-35
Col 41-45	Maneuver bn type
Col 46-50	Quantity of maneuver bns of type designated in Col 41-45
Col 51-55	Maneuver bn type
Col 56-60	Quantity of maneuver bns of type designated in Col 51-55
Col 61-65	Maneuver bn type
Col 66-70	Quantity of maneuver bns of type designated in Col 61-65
Col 71-72	Blank
Col 73-75	Sequence label
Col 76-80	Sequence number

Note:

If this division does not have a cav unit, card columns 9-72 must be blank.

BLUE BRIGADE CARD (1)

FORMAT 2A4,2X,I5,1X,A4,10I5,2X,A3,I5

Col 1- 8	"BRIGADE"
Col 9-10	Blank
Col 11-15	Initial strength
Col 16-19	Blank
Col 20	This brigade's status: A = Active R = Reserve G = Ghost*
Col 21-25	Low minisector boundary (frontage coordinate - north)
Col 26-30	High minisector boundary (frontage coordinate - south)
Col 31-35	Quantity type 1 maneuver bns assigned this brigade
Col 36-40	Quantity type 2 maneuver bns assigned this brigade
Col 41-45	Quantity type 3 maneuver bns assigned this brigade
Col 46-50	Quantity type 4 maneuver bns assigned this brigade
Col 51-55	Quantity type 5 maneuver bns assigned this brigade
Col 56-60	Quantity type 6 maneuver bns assigned this brigade
Col 61-65	Quantity type 7 maneuver bns assigned this brigade
Col 66-70	Quantity type 8 maneuver bns assigned this brigade
Col 71-72	Blank
Col 73-75	Sequence label
Col 76-80	Sequence number

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*In the case of a ghost bde only one "BRIGADE" card is required to define the bde, regardless of the quantity of maneuver bns previously defined on the "COUNTS" card. A ghost (G) bde is used when a division has only two "real" bdes assigned to it; this third ghost bde satisfies the requirement for three bdes per division.

Notes:

If a maneuver bn of type 9-18 assigned to brigade, see next card format.

All maneuver bn quantities assigned ≤ 15.

If more than eight maneuver bn types are defined on the "COUNTS" card and therefore require two or more cards/brigade description, two or more brigade description cards will be required for each Blue brigade description.

BLUE BRIGADE CARD (2)

FORMAT 2A4,12X,10I5,2X,A3,I5

Col 1- 8	"BRIGADE"
Col 9-20	Blank
Col 21-25	Quantity maneuver bn type 9
Col 26-30	Quantity maneuver bn type 10
Col 31-35	Quantity maneuver bn type 11
Col 36-40	Quantity maneuver bn type 12
Col 41-45	Quantity maneuver bn type 13
Col 46-50	Quantity maneuver bn type 14
Col 51-55	Quantity maneuver bn type 15
Col 56-60	Quantity maneuver bn type 16
Col 61-65	Quantity maneuver bn type 17
Col 66-70	Quantity maneuver bn type 18
Col 71-72	Blank
Col 73-75	Sequence label
Col 76-80	Sequence number

Note:

This card format for types 9-18, 19-28, etc.

RED DIVISION CARD

FORMAT 2A4,2X,2A4,2X,2I5,I2,I3,4I5,1X,A4,12X,A3,I5

Col 1- 8	"DIVISION"
Col 9-10	Blank
Col 11-18	Unit name
Col 19-20	Blank
Col 21-25	Low minisector frontage coordinate
Col 26-30	High minisector frontage coordinate
Col 31-32	Red division type. The Red divisional forces are assigned type designator 1, 2, or 3
Col 33-35	DS arty bns type 1 through 15
Col 36-40	Quantity of DS arty bns (max = 5)
Col 41-45	GS arty bns type 1 through 15
Col 46-50	Quantity of GS arty bns (max = 5)
Col 51-55	Initial strength, percent
Col 56-59	Blank
Col 60	Initial status A = Active R = Reserve
Col 61-72	Blank
Col 73-75	Sequence label
Col 76-80	Sequence number

RED REGIMENT CARD

FORMAT 2A4,12X,50I1,2X,A3,I5

Col 1- 8	"DIVISION"
Col 9-20	Blank
Col 21	Quantity of type 1 regt assigned to division (previous card)
Col 22	Quantity of type 2 regt assigned to division (previous card)
Col 23	Quantity of type 3 regt assigned to division (previous card)
Col 24	Quantity of type 4 regt assigned to division (previous card)
Col 25	Quantity of type 5 regt assigned to division (previous card)
Col 26	Quantity of type 6 regt assigned to division (previous card)
Col 27	Quantity of type 7 regt assigned to division (previous card)
Col 28	Quantity of type 8 regt assigned to division (previous card)
Col 29	Quantity of type 9 regt assigned to division (previous card)
Col 30	Quantity of type 10 regt assigned to division (previous card)

Etc. to Col 70 = Quantity of type 50 regt

Col 71-72	Blank
Col 73-75	Sequence label
Col 76-80	Sequence number

Note:

Maximum quantity of each type of regiment is nine.

ON-HAND EQUIPMENT CARD

FORMAT 2A4,2X,12F5.0,2X,A3,I5

Col 1- 6	"ONHAND"
Col 7-10	Blank
Col 11-15	On-hand quantity of personnel
Col 16-20	On-hand quantity of POL
Col 21-25	On-hand quantity of MN Ammo type 1
Col 26-30	On-hand quantity of Ammo type 2
Col 31-35	On-hand quantity of Other
Col 36-40	On-hand quantity of helicopter type 1
Col 41-45	On-hand quantity of helicopter type 2
Col 46-50	On-hand quantity of helicopter type 3
Col 51-55	On-hand quantity of helicopter type 4
Col 56-60	On-hand quantity of helicopter type 5
Col 61-72	Blank
Col 73-75	Sequence label
Col 76-80	Sequence number

Notes:

A minimum of one "on-hand" input is required if initial strength is less than 100. A negative input in Col 11-15 indicates no further on-hand lines will be input and initial strength number will be used to determine on-hand quantities for this unit.

If Col 11-15 is not negative, four additional "on-hand" input lines must be provided.

ON-HAND EQUIPMENT CARD

FORMAT 2A4,2X,12F5.0,2X,A3,I5

Col 1- 6	"ONHAND"
Col 7-10	Blank
Col 11-15	Quantity tank type 1 on hand
Col 16-20	Quantity tank type 2 on hand
Col 21-25	Quantity tank type 3 on hand
Col 26-30	Quantity tank type 4 on hand
Col 31-35	Quantity tank type 5 on hand
Col 36-40	Quantity tank type 6 on hand
Col 41-45	Quantity tank type 7 on hand
Col 46-50	Quantity tank type 8 on hand
Col 51-55	Quantity tank type 9 on hand
Col 56-60	Quantity tank type 10 on hand
Col 61-65	Quantity tank type 11 on hand
Col 66-70	Quantity tank type 12 on hand
Col 71-72	Blank
Col 73-75	Sequence label
Col 76-80	Sequence number

Note:

Cards 3-4 contain on-hand quantity of APC and AT/M. Card 5 contains Arty Ammo 1 and 2 and artillery tubes for the brigade/Red division DS artillery battalion. No substitution of other arty tubes for those authorized is permitted.

REINFORCING DIVISION(S) ARRIVAL CARD

FORMAT 2A4,2X,16I2,30X,A3,I5

Col 1- 8	"ARRVDVSN"
Col 9-10	Blank
Col 11-12	Theater cycle in which the reinforcing divisions will arrive in the theater
Col 13-14	Blank
Col 15-16	Army headquarters* to which the reinforcing division(s) will be assigned (Army cycle** 1)
Col 17-18	The quantity of reinforcing division(s) to be assigned, max = 31 (Army cycle** 1)
Col 19-20	Army headquarters* to which the reinforcing division(s) will be assigned (Army cycle** 2)
Col 21-22	The quantity of reinforcing division(s) to be assigned, max = 31 (Army cycle** 2)
Col 23-24	Army headquarters* to which the reinforcing division(s) will be assigned (Army cycle** 3)
Col 25-26	The quantity of reinforcing division(s) to be assigned, max = 31 (Army cycle** 3)
Col 27-28	Army headquarters* to which the reinforcing division(s) will be assigned (Army cycle** 4)
Col 29-30	The quantity of reinforcing division(s) to be assigned, max = 31 (Army cycle** 4)
Col 31-32	Army headquarters* to which the reinforcing division(s) will be assigned (Army cycle** 5)
Col 33-34	The quantity of reinforcing division(s) to be assigned, max = 31 (Army cycle** 5)
Col 35-36	Army headquarters* to which the reinforcing division(s) will be assigned (Army cycle** 6)
Col 37-38	The quantity of reinforcing division(s) to be assigned, max = 31 (Army cycle** 6)
Col 39-40	Army headquarters* to which the reinforcing division(s) will be assigned (Army cycle** 7)
Col 41-42	The quantity of reinforcing division(s) to be assigned, max = 31 (Army cycle** 7)
Col 43-72	Optional comments
Col 73-75	Sequence label
Col 76-80	Sequence number

---

*Where the army headquarters to which the reinforcing division(s) are assigned is:

- An entry of zero (0) permits the model to assign said divisions to the "optimal" army headquarters.

- An entry (integer) one (1) through N, where N is less than or equal to the number of armies which have been defined in the game when this division arrives (includes model created armies), i.e., the first army defined, by force, is = 1, the second = 2, etc.

**The user has previously specified the number of army cycles per theater cycle; therefore, an entry may not be made in a data field for an army cycle greater than the army cycles per theater cycle.

Notes:

The "COUNTS" card, Col 26-30, has specified the quantity of "ARRVDVSN" cards to be input. The total count of all arriving divisions may not exceed the count previously specified on the "COUNTS" card, Col 21-25. Maximum of fifty (50) "ARRVDVSN" cards per force (Red or Blue).

If only one army HQ exists, the assigned HQ is assumed to be to the corps HQ, not the army HQ.

ARTILLERY ARRIVAL SCHEDULE CARD

FORMAT 2A4,2X,I5,5X,8I5,12X,A3,I5

Col 1- 8	"ARRVARTY"
Col 9-10	Blank
Col 11-15	Theater cycle during which these nondivisional GS arty bns are to arrive, ≥ 2, $\leq$ quantity of theater cycles for the game
Col 16-20	Blank
Col 21-25	Quantity of type 1 nondivisional GS arty bns arriving in theater
Col 26-30	Quantity of type 2 nondivisional GS arty bns arriving in theater
Col 31-35	Quantity of type 3 nondivisional GS arty bns arriving in theater
Col 36-40	Quantity of type 4 nondivisional GS arty bns arriving in theater
Col 41-45	Quantity of type 5 nondivisional GS arty bns arriving in theater
Col 46-50	Quantity of type 6 nondivisional GS arty bns arriving in theater
Col 51-55	Quantity of type 7 nondivisional GS arty bns arriving in theater
Col 56-60	Quantity of type 8 nondivisional GS arty bns arriving in theater
Col 61-72	Optional comments
Col 73-75	Sequence label
Col 76-80	Sequence number

Note:

Maximum of fifty (50) cards.

LOGISTICAL ARRIVAL CARD

FORMAT 2A4,2X,I2,5(1X,I1,1X,I2,1X,F5.0),5X,A3,I5

Col 1- 8	"LOGISTIC"
Col 9-10	Blank
Col 11-12	Theater cycle in which this logistic load arrives in theater
Col 13	Blank
Col 14	Major item category*
Col 15	Blank
Col 16-17	If Col 14 (major item category) is a weapon, specify weapon type 1-12, except helicopters 1-5, and artillery tubes 1-8. If Col 14 is a supply item (5-9), specify partition 1-3 (blank defaults to 1)
Col 18	Blank
Col 19-23	Quantity of resupply items specified in Col 14 and 16-17, per theater cycle (4 days). Field definition 13-23 repeated four more times on each card as fields 24-34, 35-45, 46-56, and 57-67
Col 68-72	Optional comments
Col 73-75	Sequence label
Col 76-80	Sequence number

---

*Major item category: 1 = TANKS, 2 = LIGHT ARMOR, 3 = HELICOPTERS, 4 = ANTITANK and MORTARS, 5 = POL, 6 = AMMO, 7 = OTHER SUPPLIES, 8 = PERSONNEL, 9 = ARTY AMMO, 0 = ARTY TUBES.

Notes:

Major item categories 5 (POL), 6 (AMMO), 7 (OTHER SUPPLIES), 8 (PERSONNEL), and 9 (ARTY AMMO) are input in units of 1,000. Input dimensions are: supplies in tons, personnel in men, and equipment in items.

Major item categories 0-4 input as integers only, as this is the manner in which they are handled in packing routines.

Maximum input for all items for theater cycle zero (0) is 99,999. Major item categories 0-4 are limited to 2,047 maximum input for all other cycles.

MAINTENANCE CAPACITY CARD

FORMAT 2A4,2X,I2,2X,9I6,4X,A3,I5

Col 1- 8	"ARRMAINT"
Col 9-10	Blank
Col 11-12	Theater cycle
Col 13-14	Blank
Col 15-20	Maximum number of tanks that may enter partition 1 tank repair facilities in one theater cycle
Col 21-26	Maximum number of APCs that may enter partition 1 APC repair facilities in one theater cycle
Col 27-32	Maximum number of helicopters that may enter partition 1 helicopter facilities in one theater cycle
Col 33-38	Same as 15-20, for partition 2
Col 39-44	Same as 21-26, for partition 2
Col 45-50	Same as 27-32, for partition 2
Col 51-56	Same as 15-20, for partition 3
Col 57-62	Same as 21-26, for partition 3
Col 63-68	Same as 27-32, for partition 3
Col 69-72	Optional comments
Col 73-75	Sequence label
Col 76-80	Sequence number

Note:

Columns 33-70 are not used on the Red side, which has no national partitions.

UNIT SECTION ERROR MESSAGES/DIAGNOSTICS

"***ILLEGAL UNIT STATUS"

Unit currently being processed is neither ACTIVE = A, or RESERVE = R.

"***ILLEGAL MISSION ENTRY"

Starting mission for side currently being processed is neither DELAY, DEFEND, nor ATTACK.

"***NUMBER OF ARMIES EXCEEDS MAXIMUM"

The Blue force may not have more than six (6) armies; the Red force may not exceed twelve (12).

"***ERROR IN ARMY MINISECTOR BOUNDARIES"

This message is generated when either the:

1. Entire theater frontage is not covered.
2. The army's high minisector coordinate is less than or equal to its low minisector coordinate.
3. The army's low minisector coordinate is less than or equal to zero (0).
4. Two adjacent armies overlap on frontage. (Note: two adjacent armies may not have the same minisector coordinate.)

"***NUMBER OF CORPS IN ARMY OUT OF RANGE"

A maximum of five (5) corps/army is permitted. This message is generated when the count of corps for this army is less than or equal to zero (0) or greater than five (5).

"***CORPS BOUNDARIES OVERLAP ARMY BOUNDARIES"

The subordinate corps may not have frontage outside that assigned the corps' army.

"***CORPS BOUNDARIES ARE SCREWED UP"

The high minisector coordinate is greater than or equal to the low minisector coordinate.

"***MORE THAN ONE RESERVE CORPS IN ARMY"

Maximum of one (1) reserve unit to each echelon of command.

"***NUMBER OF DIVISIONS IN CORPS OUT OF RANGE"

Maximum of five (5) divisions/corps. The value specified on the "CORPS" cards is either less than or equal to zero (0) or greater than five (5).

"***THEATER CYCLE OUT OF RANGE"

The theater cycle specified for the arrival of:

1. Reinforcing division(s)
2. Reinforcing artillery
3. Resource units

is greater than that specified on the "RUNLIMIT" card, Col 11-15.

"***NUMBER OF ARTILLERY ENTRIES EXCEEDS MAXIMUM"

Maximum of fifty (50) "ARRVARTY" cards may be specified.

"***NUMBER OF RESOURCE ENTRIES EXCEEDS MAXIMUM"

Maximum of fifty (50) "LOGISTIC" cards may be specified.

"***NUMBER OF REINFORCING DIVISION ENTRIES EXCEED MAXIMUM"

Maximum of fifty (50) "ARRVDVSN" cards may be entered.

"***NUMBER OF REINFORCING DIVISIONS SCHEDULED NOT EQUAL TO NUMBER SPECIFIED ON COUNT CARD"

Check "COUNTS" card Col 21-25, this number must equal total sum of numbers on <u>all</u> "ARRVDVSN" cards Col 17-18, 21-22, 25-26, 29-30, 33-34, 37-38, 41-42.

"***CARD NOT IN ASCENDING CYCLE ORDER"

Card decks for "ARRVDVSN," ARRVARTY," and "LOGISTIC" must have theater cycles, Col 11-15, in ascending sequence.

"***TOO MANY REINFORCING DIVISIONS FOR ONE ARMY CYCLE"

A maximum of thirty-one (31) reinforcing divisions may arrive during any one army cycle.

"***NUMBER OF BN TYPES OUT OF RANGE"

A maximum of eight (8) artillery types is permitted. (Note: this value must be greater than or equal to one (1).)

"***ZERO CONVERSION FACTOR"

The artillery conversion coefficient (factor) for one of the specified artillery types is less than or equal to zero (0), i.e., if four (4) types of artillery are specified on the "ARTYTYPE" card then there must exist four positive nonzero values in Col 21-25, 26-30, 31-35, and 36-40 of this card.

"***ZERO EXPENDITURE RATE ENTRY"

Either the artillery DS or GS expenditure rate for one of the artillery type bns is less than or equal to zero (0). There must exist a positive nonzero value for the two mission modes, for each of the specified artillery types.

"***MANEUVER BN TYPE COUNT OUT OF RANGE"

The count of maneuver bn types specified on the "COUNTS" card, Col 11-15, is either less than or equal to zero (0), or greater than fifty (50).

"***WARNING - INTELLIGENCE COEFFICIENTS SUM NOT EQUAL TO ONE"

This does not terminate run, it only warns the user that the coefficients for the artillery sums to other than 100 percent.

"***MINISECTOR XXXXX NOT COMPLETELY COVERED"
"***TOTAL MINISECTOR COVERAGE ERRORS = XXXXX"

Check theater coverage by army level echelon. The entire theater frontage must be covered.

"***MINISECTOR XXXXX OVER-COVERED"
"***TOTAL MINISECTOR COVERAGE ERRORS = XXXXX"

Two adjacent armies are covering the same frontage. Armies may not share frontage.
"***NUMBER OF BLUE/RED DIVISIONS EXCEEDS MAXIMUM"

The maximum numbers of Blue and Red divisions are 70 and 125, respectively.

"***MORE THAN ONE RESERVE DIVISION IN THIS CORPS"

Each echelon of command may have a maximum of one reserve unit of the next lower echelon.

"***DIVISION BOUNDARIES OVERLAP CORPS"

A division's boundaries may not extend beyond those of its next higher headquarters (corps).

"***DIVISION BOUNDARIES SCREWED UP"

The high minisector boundary is less than the low minisector boundary.

"***DIVISION TYPE OUT OF RANGE"

The Red division type specified is either less than or equal to zero (0) or greater than three (3).

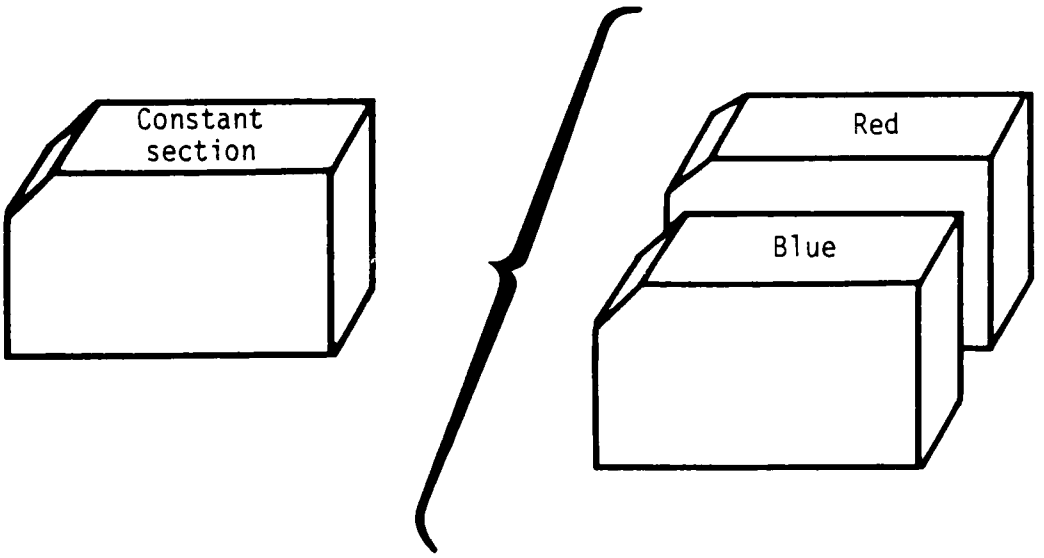
"***DIVISIONAL GS ARTY TYPE OUT OF RANGE"

The GS artillery type specified, Col 41-45, on the "DIVISION" card is either less than or equal to zero (0) or greater than the types specified on the "ARTYTYPE" card, Col 21-55.

"***DIVISION FRONTAGE LESS THAN SPECIFIED MINIMUM"

The difference between the high and low minisector coordinates for this division is less than minimum specified on the "MINISCTR" card, Col 26-30.

CONSTANT SECTION



The Constant Section defines the factors used to control missions, performance, and degradation of the forces. Formats and descriptions included are as follows:

Blue Constant Input Data Structure, Figure 1-4
Red Constant Input Data Structure, Figure 1-5
Sample Constant Input Data Card Listing
Constant Section Card
Theater Resource Delay Card
Army Resource and Unit Delay Card
Army Mission Threshold (Force Ratio) Card
Army Intelligence Card
Corps Resource and Unit Delay Card
Corps Mission Threshold (Force Ratio) Card
Corps Intelligence Card
Division Mission Threshold Card
Fatigue Factor Card
Artillery Increased Firepower Card
Personnel Assimilation Fraction Card
Personnel Logistic Support Card
Equipment Logistic Support Card
Personnel KIA, WIA Factor Card

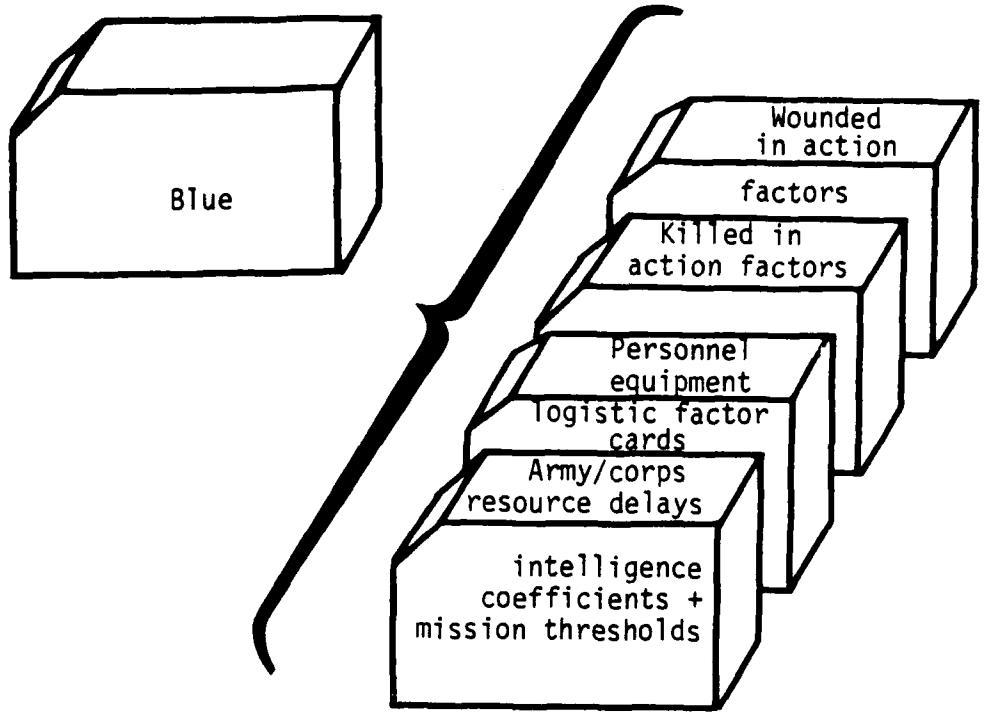


Figure 1-4. Blue Constant Input Data Structure

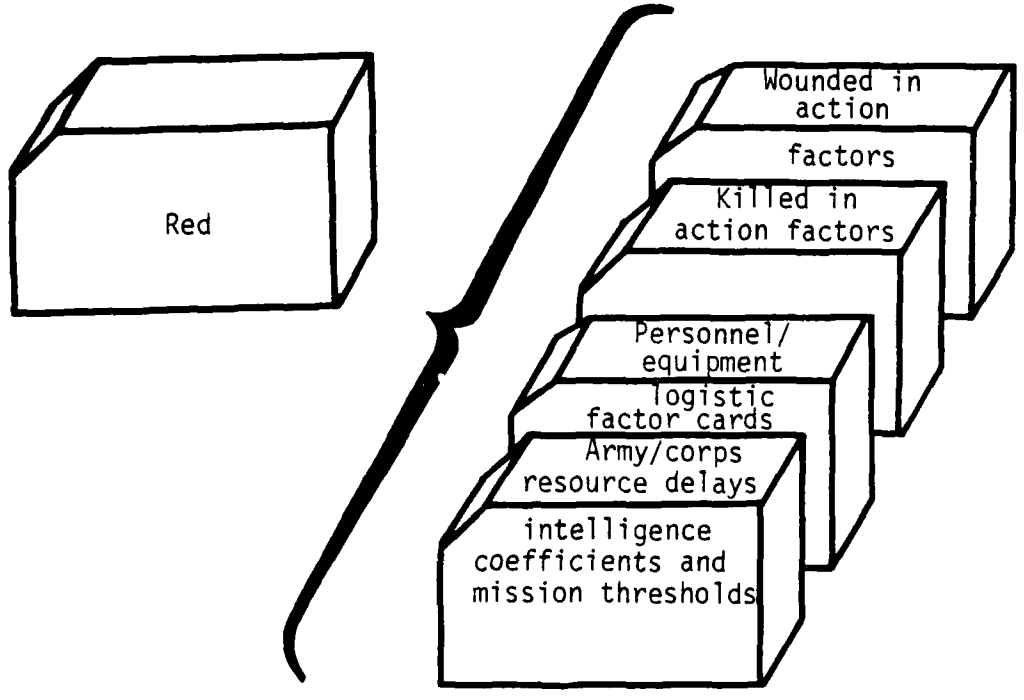


Figure 1-5. Red Constant Input Data Structure

SECTION	CONSTANT		SEQIGNOR										
TCDELAYS	1	2	1	2	5 1	2							BLU
ACDELAYS			2	1									BLU
ACTHRESH	2.0	9.0	.25	15.0	2.0	6							BLU
ACINTELL	1.0	0.0											BLU
CCDELAYS			2	1									BLU
CCTHRESH	2.0	5.0	.25	0.5	2.0	3							BLU
CCINTELL	1.0	0.0											BLU
OCTHRESH	02	01		1.0	.0		1	5	02				BLU
FATIGUE		10											BLU
ARTYRATE		.33											BLU
RESASSIM	.33	.67	.										BLU
PERSTYPE	3	1	.015	.77	.05	2.15	.25	.65					BLU
EQIPTYPE	0	1		1.0067	33								BLU
EQIPTYPE	0	1		1.0067	33								BLU
EQIPTYPE	0	1		1.0025	33								BLU
LOGLIMIT	.80	.80	.80	.80	.95	.95	.95	.95	.95	.80			BLU
PERSNKIA	.19	.16	.19		.19	.16	.25	.15	.15		.15		BLU
PERSNWIA	.76	.81	.70		.75	.70	.69	.45	.85		.85		RED
TCDELAYS	1	2	1	2	1	2							RED
ACDELAYS			2	1									RED
ACTHRESH	1.5	15.0	.25	0.0	2.0	6							RED
ACINTELL	1.0	0.0											RED
CCDELAYS			2	1									RED
CCTHRESH	1.5	5.0	.25	0.5	2.0	3							RED
CCINTELL	1.0	0.0											RED
OCTHRESH	02	01		1.0	.0								RED
FATIGUE													RED
APTYRATE		1.0			1								RED
RESASSIM	1.		0										RED
PERSTYPE	3	1	.015	.77	.05	2.15	.22	.69					RED
EQIPTYPE	0	1		1.0067	33								RED
EQIPTYPE	0	1		1.0067	33								RED
EQIPTYPE	0	1		1.0067	33								RED
LOGLIMIT	.90	.80	.80	.80	.95	.95	.95	.95	.95	.80			RED
PERSNKIA	.15	.25	.16		.19	.18	.16	.19	.15		.15		RED
PERSNWIA	.45	.69	.70		.75	.70	.81	.76	.85		.85		RED

CONSTANT SECTION CARD

FORMAT 2A4,2X,2A4,2X,2A4,2X,I5,37X,A3,I5

Col 1- 8	"SECTION"
Col 9-10	Blank
Col 11-18	"CONSTANT"
Col 19-20	Blank
Col 21-28	"SEQCOMNT" ignore out of sequence cards, but comment "SEQABORT" abort if cards out of sequence "SEQIGNOR" ignore out of sequence cards
Col 29-30	Blank
Col 31-35	Logical input unit for this section of data
Col 36-72	Optional comments
Col 73-75	Sequence label
Col 76-80	Sequence number

THEATER RESOURCE DELAY CARD

FORMAT 2A4,2X,8I5,22X,A3,I5

Col 1- 8	"TCDELAYS"
Col 9-10	Blank
Col 11-15	Time (theater cycles) delay for POL w/friendly air environment to reach frontline units
Col 16-20	Time (theater cycles) delay for POL wo/friendly air environment to reach frontline units
Col 21-25	Time (theater cycles) delay for AMMO w/friendly air environment to reach frontline units
Col 26-30	Time (theater cycles) delay for AMMO wo/friendly air environment to reach frontline units
Col 31-35	Time (theater cycles) delay for OTHER SUPPLIES w/friendly air environment to reach frontline units
Col 36-40	Time (theater cycles) delay for OTHER SUPPLIES wo/friendly air environment to reach frontline units
Col 41-50	Blank
Col 51-72	Optional comments
Col 73-75	Sequence label
Col 76-80	Sequence number

Note:

A value of 1 results in these supplies being delivered to the units during the upcoming theater period. A value of 2 results in one theater period delay, etc. (The values must not be zero.) Maximum allowable delay is 20 theater cycles.

ARMY RESERVE UNIT DELAY CARD

FORMAT	2A4,2X,4I5,42X,A3,I5
Col 1- 8	"ACDELAYS"
Col 9-20	Blank
Col 21-25	Army reserve corps commitment delay, in corps cycles, without friendly air environment
Col 26-30	Army reserve corps commitment delay, in corps cycles, with friendly air environment
Col 31-72	Optional comments
Col 73-75	Sequence label
Col 76-80	Sequence number

Note:

A value of zero results in no delay. A value of 1 results in one corps cycle delay, etc. Maximum allowable delay is 6 corps cycles.

ARMY MISSION THRESHOLD (Force Ratio) CARD

FORMAT 2A4,2X,5F5.0,I5,32X,A3,I5

Col 1- 8	"ACTHRESH"
Col 9-10	Blank
Col 11-15	Attack mission ($<$ defend)*
Col 16-20	Attack with reserve ($<$ commit reserve, $\geq$ reconstitute reserve)*
Col 21-25	Defend mission ($<$ delay)*
Col 26-30	Defend with reserve ($<$ commit reserve, $\geq$ reconstitute reserve)*
Col 31-35	Delay with reserve ($<$ commit reserve, $\geq$ reconstitute reserve)*
Col 36-40	Maximum distance in minisectors an army can shift a corps boundary during boundary adjustment in defense**
Col 41-72	Optional comments
Col 73-75	Sequence label
Col 76-80	Sequence number

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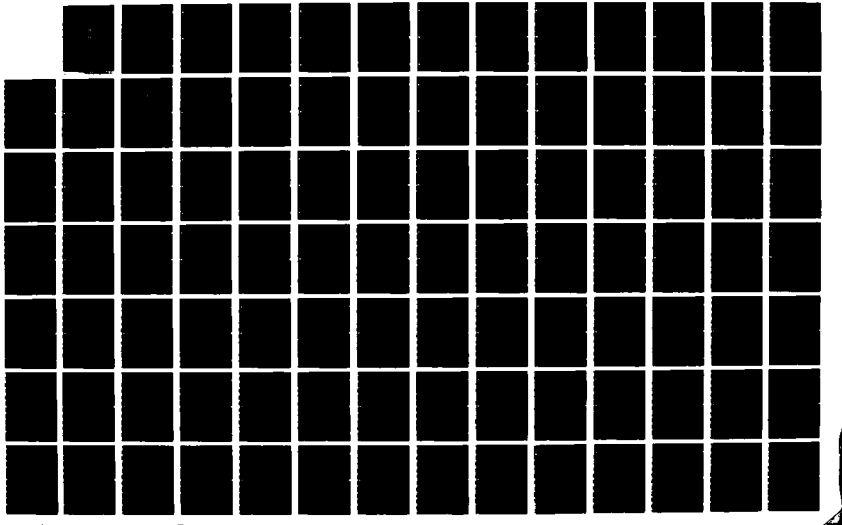
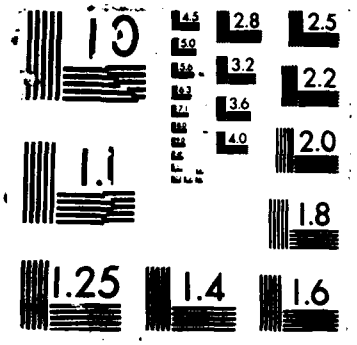
*See para 3-4 of Volume I for explanation of the use of these thresholds.

**See para 3-5 of Volume I for explanation of this factor.

AD-A182 343 CONCEPTS EVALUATION MODEL VI (CEM VI) VOLUME 2 CEM USER'S HANDBOOK(U) ARMY CONCEPTS ANALYSIS AGENCY BETHESDA MD W T ALLISON AUG 85 CAA-D-85-1-VOL-1 2/3

UNCLASSIFIED F/G 12/5 NL




2.8
2.5
3.2
2.2
3.6
2.0
4.0
1.8
1.1
1.25
1.4
1.6

ARMY INTELLIGENCE CARD

FORMAT 2A4,2X,3F5.0,47X,A3,I5

Col 1- 8	"ACINTELL"
Col 9-10	Blank
Col 11-15	"a" weighting coefficient for last army cycle (n) "e" if TOS yes
Col 16-20	"b" weighting coefficient for army cycle (n-1) "f" if TOS yes
Col 21-25	"c" weighting coefficient to extrapolate trend
Col 26-72	Optional comments
Col 73-75	Sequence label
Col 76-80	Sequence number

Note:

See para 6-2d of Volume I for explanation of the algorithm using these coefficients.

CORPS RESERVE AND UNIT DELAY CARD

FORMAT 2A4,2X,4I5,42X,A3,I5

Col 1- 8	"CCDELAYS"
Col 9-20	Blank
Col 21-25	Corps reserve division commitment delay, in division cycles, without friendly air environment
Col 26-30	Corps reserve division commitment delay, in division cycles, with friendly air environment
Col 31-72	Optional comments
Col 73-75	Sequence label
Col 76-80	Sequence number

Note:

A value of zero results in no delay. A value of 1 results in a delay of one division cycle, etc. Maximum allowable delay is 6 division cycles.

CORPS MISSION THRESHOLD (Force Ratio) CARD

FORMAT 2A4,2X,5F5.0,I5,32X,A3,I5

Col 1- 8	"CCTHRESH"
Col 9-10	Blank
Col 11-15	Attack mission ($<$ defend)*
Col 16-20	Attack with reserve ($<$ commit reserve, $\geq$ reconstitute reserve)*
Col 21-25	Defend mission ($<$ delay)*
Col 26-30	Defend with reserve ($<$ commit reserve, $\geq$ reconstitute reserve)*
Col 31-35	Delay with reserve ($<$ commit reserve, $\geq$ reconstitute reserve)*
Col 36-40	Maximum distance in minisectors that a corps can shift a division's boundary during boundary adjustment in defense**
Col 41-72	Optional comments
Col 73-75	Sequence label
Col 76-80	Sequence number

*See para 4-4 of Volume I for explanation of the use of these thresholds.

**See para 4-5 of Volume I for explanation of this factor.

CORPS INTELLIGENCE CARD

FORMAT 2A4,2X,3F5.0,47X,A3,I5

Col 1- 8	"CCINTELL"
Col 9-10	Blank
Col 11-15	"a" weighting coefficient for last corps cycle "e" if TOS yes
Col 16-20	"b" weighting coefficient for next to last corps cycle "f" if TOS yes
Col 21-25	"c" weighting coefficient to extrapolate trend
Col 26-72	Optional comments
Col 73-75	Sequence label
Col 76-80	Sequence number

Notes:

These intelligence coefficients apply for this corps looking at enemy corps.

See para 6-2d of Volume I for explanation of the algorithm using these coefficients.

DIVISION MISSION THRESHOLD CARD

FORMAT 2A4,2X,5F5.0,4I5,17X,A3,I5

Col 1- 8	"DCTHRESH"
Col 9-10	Blank
Col 11-15	Attack threshold, if average state of all subordinate units , division may attack*
Col 16-20	Defend threshold, if average state attack to this entry, division may defend. If this entry, division must delay*
Col 21-25	Not used
Col 26-30	Intelligence coefficient for estimating opponent's status during division cycle n-1 (Blue w/TOS for current division cycle n)**
Col 31-35	Intelligence coefficient for estimating opponent's status during division cycle n-2 (Blue w/TOS for division cycle n-1)**
Col 36-40	Not used
Col 41-45	First theater cycle for alternate attack threshold
Col 46-50	Last theater cycle for alternate attack threshold
Col 51-55	Alternate attack threshold*
Col 56-72	Optional comments
Col 73-75	Sequence label
Col 76-80	Sequence number

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*Threshold may exceed 100. See para 1-9 of Volume I for explanation of brigade state and these thresholds.

**See para 6-2d of Volume I for explanation of the use of these coefficients.

RESERVE BRIGADE STATE DIFFERENTIAL CARD

FORMAT 2A4,2X,2I5,52X,A3,I5

Col 1- 8	"FATIGUE"
Col 9-15	Blank
Col 16-20	State differential threshold for determining exchange of weak on-line brigade for strong reserve brigade
Col 21-72	Optional comments
Col 73-75	Sequence label
Col 76-80	Sequence number

Note:

Value applies to Blue side only but card is required for each side.

ARTILLERY INCREASED FIREPOWER CARD

FORMAT 2A4,2X,3F5.0,4X,I1,2F10.0,22X,A3,I5

Col 1- 8	"ARTYRATE"
Col 9-15	Blank
Col 16-20	Fraction of GS artillery a division may convert to DS*
Col 21-29	Blank
Col 30	Red side (2) only; 1 = all DS and GS artillery organic to a reserve division will be assigned to take under fire any opposing enemy reserve units; 0 = all DS and GS artillery organic to a reserve division will be held in reserve with division
Col 31-50	Blank
Col 51-72	Optional comments
Col 73-75	Sequence label
Col 76-80	Sequence number

*Blue may not exceed .33, as entry is for each Blue brigade.

PERSONNEL ASSIMILATION FRACTION CARD

FORMAT 2A4,2X,10F6.2,2X,A3,I5

Col 1- 8	"RESASSIM"
Col 9-10	Blank
Col 11-16	Fraction of personnel assimilated during division cycle i
Col 16-22	Same for cycle i+1
Col 23-28	Same for cycle i+2
Col 29-34	Same for cycle i+3
Col 35-40	Same for cycle i+4
Col 41-46	Same for cycle i+5
Col 47-52	Same for cycle i+6
Col 53-58	Same for cycle i+7
Col 59-64	Same for cycle i+8
Col 65-70	Same for cycle i+9
Col 71-72	Blank
Col 73-75	Sequence label
Col 76-80	Sequence number

LOGISTIC SUPPORT (Personnel) CARD

FORMAT 2A4,2X,10F5.0,12X,A3,I5

Col 1- 8	"PERSTYPE"
Col 9-10	Blank
Col 11-15	Time (theater cycles) personnel sent to hospital must remain before recommitment to front (Zero entry will return personnel in next theater cycle)
Col 16-20	Time (theater cycles) delay encountered by replacement (new arrivals in theater from ports and hospitals) personnel to reach front lines (May not be zero or blank)
Col 21-25	Fraction of total DNBI that are killed
Col 26-30	Fraction of WIA requiring hospitalization
Col 31-35	Fraction of surviving DNBI requiring hospitalization
Col 36-40	Nonbattle losses per 100 men
Col 41-45	Fraction of WIA sent to theater hospital
Col 46-50	Fraction of DNBI sent to theater hospital
Col 51-60	Blank
Col 61-72	Optional comments
Col 73-75	Sequence label
Col 76-80	Sequence number

LOGISTIC SUPPORT (Equipment) CARD(S)*

FORMAT 2A4,2X,5F5.0,37X,A3,I5

Col 1- 8	"EQIPTYPE"
Col 9-10	Blank
Col 11-15	Time (theater cycles) to repair one weapon of this major item category* (zero will return weapon in next theater cycle)
Col 16-20	Friendly air environment weapon replacement delay time (theater cycles) (entry may not be zero or blank)
Col 21-25	Enemy air environment weapon replacement delay time (theater cycles) (entry may not be zero or blank)
Col 26-30	Coefficient of repairable damaged weapons abandoned per hectometer of FEBA lost to enemy**
Col 31-35	Blank
Col 36-72	Optional comments
Col 73-75	Sequence label
Col 76-80	Sequence number

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*Cards - 1 = TANKS, 2 = LIGHT ARMOR, 3 = HELICOPTERS. (Antitank/mortars have same replacement delays as TANKS.)

**Abandoned = Repairable x (1 - exp(coefficient x neg FEBA movement))

Notes:

This card required for a major weapon category only if the force contains weapons in the respective category.

See para 2-2 and 5-4k of Volume I for discussion of maintenance support.

SUPPLY ABSORPTION LIMIT CARD

FORMAT 2A4,2X,10F5.0,12X,A3,I5

Col 1- 8	"LOGLIMIT"
Col 9-10	Blank
Col 11-15	Maximum division cycle absorption of TANK shortage
Col 16-20	Maximum division cycle absorption of APC shortage
Col 21-25	Maximum division cycle absorption of HELI shortage
Col 26-30	Maximum division cycle absorption of AT/M shortage
Col 31-35	Maximum division cycle absorption of POL shortage
Col 36-40	Maximum division cycle absorption of AMMO shortage
Col 41-45	Maximum division cycle absorption of OTHER shortage
Col 46-50	Maximum division cycle absorption of PERSONNEL shortage
Col 51-55	Maximum division cycle absorption of ARTY AMMO shortage
Col 56-60	Maximum division cycle absorption of ARTY TUBES shortage
Col 61-72	Optional comments
Col 73-75	Sequence label
Col 76-80	Sequence number

Notes:

Above input values are fractions ranging from 0.00 to 1.00.

Cards required for Blue and Red--follows third EQIPTYPE card.

PERSONNEL KILLED IN ACTION (KIA) CARD

FORMAT 2A4,2X,10F6.2,2X,A3,I5

Col 1- 8	"PERSNKIA"
Col 9-10	Blank
Col 11-16	Fraction personnel casualties KIA for BAD
Col 17-22	Fraction personnel casualties KIA for BAPD
Col 23-28	Fraction personnel casualties KIA for BAHD
Col 29-34	Fraction personnel casualties KIA for ME
Col 35-40	Fraction personnel casualties KIA for RAHD
Col 41-46	Fraction personnel casualties KIA for RAPD
Col 47-52	Fraction personnel casualties KIA for RAD
Col 53-58	Fraction personnel casualties KIA for Quiet
Col 59-64	Fraction personnel casualties KIA for Reserve
Col 65-72	Blank
Col 73-75	Sequence label
Col 76-80	Sequence number

PERSONNEL WOUNDED IN ACTION (WIA) CARD

FORMAT 2A4,2X,10F6.2,2X,A3,I5

Col 1- 8	"PERSNWIA"
Col 9-10	Blank
Col 11-16	Fraction personnel casualties WIA for BAD
Col 17-22	Fraction personnel casualties WIA for BAPD
Col 23-28	Fraction personnel casualties WIA for BAHD
Col 29-34	Fraction personnel casualties WIA for ME
Col 35-40	Fraction personnel casualties WIA for RAHD
Col 41-46	Fraction personnel casualties WIA for RAPD
Col 47-52	Fraction personnel casualties WIA for RAD
Col 53-58	Fraction personnel casualties WIA for Quiet
Col 59-64	Fraction personnel casualties WIA for Reserve
Col 65-72	Blank
Col 73-75	Sequence label
Col 76-80	Sequence number

Note:

Personnel CMIA = total personnel casualties - personnel WIA and KIA.

CONSTANT SECTION ERROR MESSAGES/DIAGNOSTICS

"LABEL ERROR - ABOVE CARD SHOULD BE _____"

The label, Col 1-8, is incorrect. Check spelling and count of expected cards of the type specified by diagnostic message.

"***WARNING - SUM OF INTELLIGENCE COEFFICIENTS NOT EQUAL TO ONE"

The army or corps intelligence coefficient a, b, c, or e and f in the case of a TOS yes, sum to greater than one (1). This does not terminate CEM preprocessor as the user may well wish to examine such parametric analysis. However, the user is cautioned that the algorithm was not designed with such value(s) in mind.

"***THRESHOLD STATE VALUE OUT OF RANGE"

The mission threshold state for division is either less than zero (0) or greater than one hundred (100), either value is out of computational range.

"***SUM OF ASSIMILATION FRACTIONS NOT EQUAL TO ONE"

The percentage of resources assimilated up to 10 division cycles does not equal one hundred percent (100%) of those arriving.

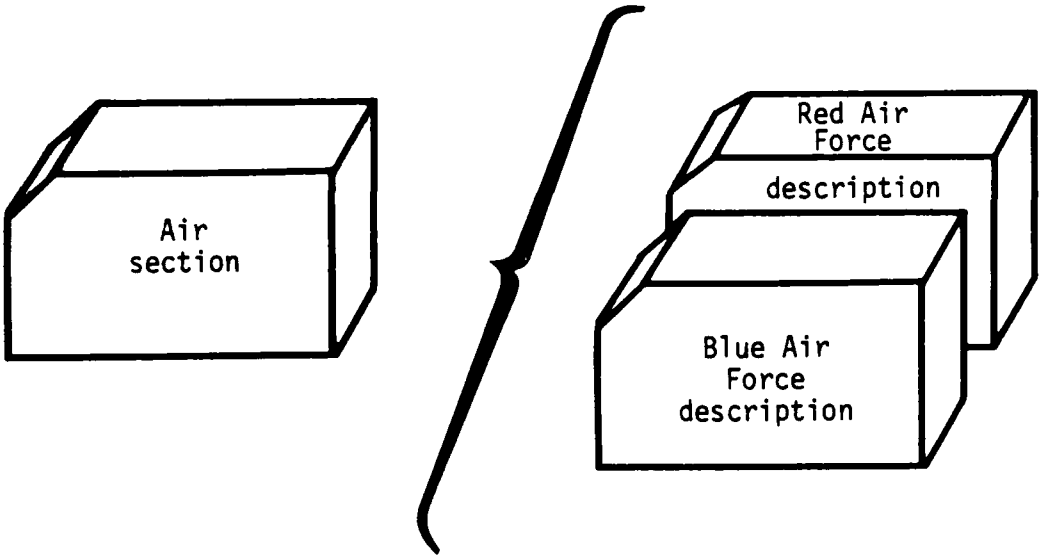
"***DIVISION GS ARTY ALLOCATION GREATER THAN ONE"

The percentage of GS artillery converted to DS may not exceed one hundred percent (100%) of that artillery. (For Blue max of 3 brigades/division.)

"***NEGATIVE VALUE NOT PERMITTED"

Check last card read (last card listed).

AIR SECTION



The Air Section defines data required by the Air Submodel to control mission, attrition, SAM and ADA units, and the threshold for the reallocation of aircraft. Data formats and descriptions are included as follows:

Sample Blue and Red Air Input Data Card Listing
Air Section Card
Run/Repeat Options Card
Initial Aircraft Counts Card
Initial SAM/ADA Counts Card
Initial Effort Allocation Card
Low Effort Allocation Bounds Card
High Effort Allocation Bounds Card
Aircraft Attrition Thresholds Card
Mission Allocation Change Increment Card
FEBA Movement Thresholds Card
Friendly Air Environment Threshold Card
SAM to ADA Conversion Factors Card
SAM/ADA Expenditure Rate Card
Scramble Rates Card
Aircraft Risk, Shelter, and Counterair Card
Close Air Support Data Card
TAC Fighter Squadron (CAS) Counterbattery Card
Air-to-Air Kill Probabilities Card
Air-to-Ground-to-Air Kill Probabilities Card
Filler Aircraft Count Card
Filler Aircraft Specification Card
Air Section Error Messages/Diagnostics Description

SECTION AIROPTNS	AIR AIRMOD	SEQIGNOR PRINT	5					
INITAC	2359	190	774	.20				BLU
INITADA	112	1296	999					BLU
INITALFR	.23	.25	.52					BLU
ALLOBNOS	.14	.10	.43					BLU
ALHIBNOS	.34	.30	.71					BLU
ATRTTHRS	.01	.01	.12					BLU
ALLOCHNG	-.01 -.01	.00 .02	-.02 -.02	-.01 -.01				BLU
ALLOCHNG	-.01 .02	-.02 -.02	.00 .02	-.01 -.01				BLU
ALLOCHNG	.02 -.01	.02 .00	.02 .00	.02 .02				BLU
FRMVTHRS	25.	40.						BLU
FAENTHRS	5200							BLU
SMCNVFCT	3.0	3.0						BLU
ADSMEXPR	10.0	1.5						BLU
SCRAMBLE	1.29	1.315						BLU
RISKDATA	.35	.20	1263.	.08				BLU
CASDATA		33.89	18	.0152	.0129	.0172		BLU
CASIFPS				.49				BLU
PROBKAIR	.281	.059	.023	.045	.059			BLU
PROBKGND	.40	.13	.89	.0000050	.0000066			BLU
FCARDKNT	8							BLU
ACFILLER	2	60	0	30	30	46		BLU
ACFILLER	3	60	0	30	12	0		BLU
ACFILLER	4	60	0	39	0	0		BLU
ACFILLER	5	0	0	0	0	107		BLU
ACFILLER	10	150	0	0	0	46		BLU
ACFILLER	12	150	0	0	0	0		BLU
ACFILLER	13	0	0	0	0	107		BLU
ACFILLER	15	125	0	0	0	0		BLU
INITAC	1629	345	1555	.33				RED
INITADA	230	698	0					RED
INITALFR	.16	.78	.06					RED
ALLOBNOS	.24	.15	.13					RED
ALHIBNOS	.45	.63	.40					RED
ATRTTHRS	.015	.015	.12					RED
ALLOCHNG	-.01 -.01	.00 .01	-.02 -.02	-.01 -.01				RED
ALLOCHNG	-.01 .02	-.02 -.01	.01 .02	-.01 -.01				RED
ALLOCHNG	.02 -.01	.02 .00	.01 .00	.02 .02				RED
FRMVTHRS	20.	30.						RED
FAENTHRS	4000							RED
SMCNVFCT	2.0	2.5						RED
ADSMEXPR	15.0	1.0						RED
SCRAMBLE	1.6	2.26						RED
RISKDATA	.40	.25	1990.	.10				RED
CASDATA		83.51	21	.0650	.0650	.0210		RED
CASIFPS				.50				RED
PROBKAIR	.261	.035	.004	.028	.013			RED
PROBKGND	.26	.06	.51	.00003873	.00001657			RED
FCARDKNT	7							RED
ACFILLER	2	90	30	60	45	170		RED
ACFILLER	3	90	38	60	19	68		RED
ACFILLER	4	93	0	177	27	102		RED
ACFILLER	5	0	0	0	27	102		RED
ACFILLER	8	0	0	0	27	102		RED
ACFILLER	12	0	75	0	0	0		RED
ACFILLER	16	0	110	0	0	0		RED

AIR SECTION CARD

FORMAT 2A4,2X,2A4,2X,2A4,2X,I5,37X,A3,I5

Col 1- 8	"SECTION"
Col 9-10	Blank
Col 11-18	"AIR" (left justified)
Col 19-20	Blank
Col 21-28	"SEQCOMNT" ignore out of sequence cards, but comment "SEQABORT" abort preprocessor run if Col 76-80 not in ascending sequence "SEQIGNOR" ignore and do not comment on out of sequence cards
Col 29-30	Blank
Col 31-35	Logical input unit for this section of data
Col 36-72	Optional comments
Col 73-75	Sequence label
Col 76-80	Sequence number

RUN/REPORT OPTION CARD

FORMAT 2A4,2X,2A4,2X,2A4,44X,A3,I5

Col 1- 8	"AIROPTNS"
Col 9-10	Blank
Col 11-18	"NOAIRMOD" CEM will bypass air model "AIRMOD" CEM will execute air model
Col 19-20	Blank
Col 21-28	"SUPPRESS" no air model reports "PRINT" print air model reports
Col 29-72	Optional comments
Col 73-75	Sequence label
Col 76-80	Sequence number

INITIAL AIRCRAFT COUNTS CARD

FORMAT 2A4,2X,3F10.0,F10.2,22X,A3,I5

Col 1- 8	"INITAC"
Col 9-10	Blank
Col 11-20	Count of TAC fighters on primary bases
Col 21-30	Count of TAC fighters on sanctuary bases
Col 31-40	Count of air defense fighters on primary bases
Col 41-50	Sweep fighters/TAC fighters ratio (fraction of total input TAC fighters that perform as sweep fighters ≥ 0, ≤ 1.0)*
Col 51-72	Optional comments
Col 73-75	Sequence label
Col 76-80	Sequence number

*See para 7-2b of Volume I for use of this fraction.

INITIAL SAM/ADA COUNTS CARD

FORMAT 2A4,2X,3F10.0,32X,A3,I5

Col 1- 8	"INITADA"
Col 9-10	Blank
Col 11-20	Quantity of high altitude SAM (units)*
Col 21-30	Quantity of low altitude SAM (units)*
Col 31-40	Quantity of air defense artillery fire units
Col 41-72	Optional comments
Col 73-75	Sequence label
Col 76-80	Sequence number

*Unit of resolution related to conversion factor on "SMCNVFT" card.

INITIAL EFFORT ALLOCATION CARD

FORMAT 2A4,2X,3F10.2,32X,A3,I5

Col 1- 8	"INITALFR"
Col 9-10	Blank
Col 11-20	Fraction of TAC fighters initially allocated to armed recon and interdiction role
Col 21-30	Fraction of TAC fighters initially allocated to counter-air role
Col 31-40	Fraction of TAC fighters initially allocated to close air support role
Col 41-72	Optional comments
Col 73-75	Sequence label
Col 76-80	Sequence number

Note:

The sum of the three fractions entered on this card must = 1.0.

LOW EFFORT ALLOCATION BOUNDS CARD

FORMAT	2A4,2X,3F10.2,32X,A3,I5
Col 1- 8	"ALLOBNDS"
Col 9-10	Blank
Col 11-20	Smallest fraction of TAC fighters which may be allocated to the armed recon and interdiction role
Col 21-30	Same as Col 11-20 but for counterair role
Col 31-40	Same as Col 11-20 but for close air support role
Col 41-72	Optional comments
Col 73-75	Sequence label
Col 76-80	Sequence number

Note:

See Table 7-1 of Volume I for employment of these values.

HIGH EFFORT ALLOCATION BOUNDS CARD

FORMAT 2A4,2X,3F10.2,32X,A3,I5

Col 1- 8	"ALHIBNDS"
Col 9-10	Blank
Col 11-20	Largest fraction of TAC fighter which may be allocated to armed recon and interdiction role
Col 21-30	Same as Col 11-20 but for counterair role
Col 31-40	Same as Col 11-20 but for close air support role
Col 41-72	Optional comments
Col 73-75	Sequence label
Col 76-80	Sequence number

Note:

See Table 7-1 of Volume I for employment of these values.

AIRCRAFT ATTRITION THRESHOLDS CARD

FORMAT 2A4,2X,3F10.2,32X,A3,I5

Col 1- 8	"ATRTTHRS"
Col 9-10	Blank
Col 11-20	Maximum acceptable attrition rate threshold in AR/I role*
Col 21-30	Maximum acceptable attrition rate threshold in CA role*
Col 31-40	Maximum acceptable attrition rate threshold for aircraft on primary airbases**
Col 41-72	Optional comments
Col 73-75	Sequence label
Col 76-80	Sequence number

*$\frac{\text{Number of losses/theater period}}{\text{Number of sorties/theater period}}$

**$\frac{\text{Number of losses in theater period}}{\text{Airbase inventory at beginning of theater period}}$

Note: See Table 7-1 of Volume I for employment of these values.

MISSION ALLOCATION CHANGE INCREMENT CARD

FORMAT 2A4,2X,8F5.2,22X,A3,I5

		AR/I	CA	AIRBASE
Col 1- 8	"ALLOCHNG"			
Col 9-10	Blank			
Col 11-15	Percent change/mission allocation for	No*	No	No
Col 16-20	Percent change/mission allocation for	No	No	Yes
Col 21-25	Percent change/mission allocation for	No	Yes	No
Col 26-30	Percent change/mission allocation for	No	Yes	Yes
Col 31-35	Percent change/mission allocation for	Yes	No	No
Col 36-40	Percent change/mission allocation for	Yes	No	Yes
Col 41-45	Percent change/mission allocation for	Yes	Yes	No
Col 46-50	Percent change/mission allocation for	Yes	Yes	Yes
Col 51-72	Optional comments			
Col 73-75	Sequence label			
Col 76-80	Sequence number			

There are eight entries per card, which correspond to eight possible combinations of the three attrition thresholds being exceeded.

Note that the total allocation changes for a given situation for all missions are obtained by reading down the same column of numbers of the three data cards; for example, in a situation when only the airbase attrition threshold is exceeded, the appropriate changes would be selected from Col 16-20 on each data card.

Also, the changes are directly additive. In a situation where the current mission allocation percentages are 50 percent for AR/I, 25 percent to CA, and 25 percent to CAS; and the allocation changes dictated by the attrition thresholds were -10 percent to AR/I, 5 percent to CA, and 5 percent to CAS --the new allocations would be 40 percent to AR/I, 30 percent to CA, and 30 percent to CAS. The allocation changes are expressed in terms of percentage of total aircraft, rather than percentage of current mission allocation. (See Table 7-1 of Volume I for more explanation.)

From the above two statements, it is obvious that the sum of all allocation changes for a given situation must be equal to zero, to avoid allocating other than 100 percent of available aircraft.

Card 1 = AR/I allocation change increment
Card 2 = CA allocation change increment
Card 3 = CAS allocation change increment

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*No - current attrition rate is less than specified threshold.
Yes - current allocation rate exceeds specified threshold.

FEBA MOVEMENT THRESHOLDS CARD

FORMAT	2A4,2X,2F10.2,42X,A3,I5
Col 1- 8	"FBMVTHRS"
Col 9-10	Blank
Col 11-20	Low panic threshold - if the average FEBA movement (hm/DIV cycle) (See MOVEFCTR card description in SCENARIO SECTION) exceeds this value, all effort previously allocated to AR/I mission will be temporarily diverted to CAS. (≥ 0)
Col 21-30	High panic threshold - if the average FEBA movement (hm/DIV cycle) exceeds this value, all air effort will be temporarily diverted to CAS. (≥ 0)
Col 31-72	Optional comments
Col 73-75	Sequence label
Col 76-80	Sequence number

Notes:

In addition to the regularly scheduled daily changes in air mission allocation, the air model has the capability of operating in "panic mode;" depending on the smoothed average ground rate, it will temporarily direct aircraft to a close air support (CAS) role, if the friendly ground forces are being pushed back too rapidly. The two thresholds, in effect, tell the air model when to panic and how much. (See para 7-2b of Volume I.)

"Temporary diversion" means that, as soon as the average movement coefficient drops below the panic threshold again, previous effort allocations will be restored.

FRIENDLY AIR ENVIRONMENT THRESHOLD CARD

FORMAT 2A4,2X,F10.0,52X,A3,I5

Col 1- 8	"FAENTHRS"
Col 9-10	Blank
Col 11-20	Enemy aircraft density threshold for loss of friendly air environment*
Col 21-72	Optional comments
Col 73-75	Sequence label
Col 76-80	Sequence number

---

*Number of successful enemy CA and AR/I sorties during the current theater cycle, above which the friendly air environment will be lost. Loss of friendly air environment could mean extra delays in reserve commitments at army and corps levels, and extra delays in the arrival of replacements and resupply.

SAM TO ADA CONVERSION FACTORS CARD

FORMAT 2A4,2X,2F10.2,42X,A3,I5

Col 1- 8	"SMCNVFCT"
Col 9-10	Blank
Col 11-20	Conversion factor of high altitude SAM to ADA fire unit
Col 21-30	Conversion factor of low altitude SAM to ADA fire unit
Col 31-72	Optional comments
Col 73-75	Sequence label
Col 76-80	Sequence number

Note:

See para 7-2d of Volume I for use of these factors.

SAM/ADA EXPENDITURE RATE CARD

FORMAT 2A4,2X,2F10.2,42X,A3,I5

Col 1- 8	"ADSMEXPR"
Col 9-10	Blank
Col 11-20	SAM tons/aircraft killed by SAM
Col 21-30	ADA tons/aircraft killed by ADA
Col 31-72	Optional comments
Col 73-75	Sequence label
Col 76-80	Sequence number

SCRAMBLE RATES CARD

FORMAT	2A4,2X,2F10.2,42X,A3,I5

Col 1- 8	"SCRAMBLE"
Col 9-10	Blank
Col 11-20	TAC fighters daily sortie rate/aircraft
Col 21-30	Air defense fighters daily sortie rate/aircraft
Col 31-72	Optional comments
Col 73-75	Sequence label
Col 76-80	Sequence number

AIRCRAFT RISK, SHELTER, AND COUNTERAIR CARD

FORMAT 2A4,2X,2F10.2,F10.0,F10.2,22X,A3,I5

Col 1- 8	"RISKDATA"
Col 9-10	Blank
Col 11-20	Fraction of TAC fighters at risk on primary bases
Col 21-30	Fraction of air defense fighters at risk on primary bases
Col 31-40	Quantity of aircraft shelters on primary bases
Col 41-50	Fraction of counterair (CA) allocated to attack SAM sites
Col 51-72	Optional comments
Col 73-75	Sequence label
Col 76-80	Sequence number

Note:

See para 7-2e in Volume I for explanation of this factor.

CLOSE AIR SUPPORT DATA CARD

FORMAT 2A4,2X,2F10.2,F10.0,3F10.4,2X,A3,I5

Col 1- 8	"CASDATA"
Col 9-20	Blank
Col 21-30	Average quantity of air defense fire units in the division ADA, per Blue brigade or Red division
Col 31-40	Number of aircraft in each CAS squadron
Col 41-50	Loss rate in support of ground force units in delay mission*
Col 51-60	Loss rate in support of ground force units in defend mission*
Col 61-70	Loss rate in support of ground force units in attack mission*
Col 71-72	Blank
Col 73-75	Sequence label
Col 76-80	Sequence number

*Loss rate is in terms of aircraft lost per squadron, per enemy AD fire unit, per division cycle on the basis of one AD fire unit per minisector density.

TAC FIGHTER SQUADRON (CAS) IFPS CARD

FORMAT 2A4,2X,4F10.0,22X,A3,I5

Col 1- 8	"CASIFPS"
Col 9-40	Blank
Col 41-50	Fraction of GS CAS allocated to counterbattery (CB) role*
Col 51-72	Optional comments
Col 73-75	Sequence label
Col 76-80	Sequence number

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*The remaining GS CAS is directed against reserve units, blank = 0, entry greater than 1.0 or negative is not valid and will cause program termination.

AIR-TO-AIR KILL PROBABILITIES CARD

FORMAT	2A4,2X,5F10.4,12X,A3,I5
Col 1- 8	"PROBKAIR"
Col 9-10	Blank
Col 11-20	Probability air defense fighter will intercept enemy penetrator aircraft
Col 21-30	Probability air defense fighter kills intercepted penetrating TAC fighter
Col 31-40	Probability penetrating TAC fighter kills intercepting air defense fighter
Col 41-50	Probability air defense fighter kills intercepted penetrating sweep fighter
Col 51-60	Probability penetrating sweep fighter kills intercepting air defense fighter
Col 61-72	Optional comments
Col 73-75	Sequence label
Col 76-80	Sequence number

Note:

See para 7-2c in Volume I for explanation and algorithms employing these probability figures.

AIR-TO-GROUND-TO-AIR KILL PROBABILITIES CARD

FORMAT 2A4,2X,5F10.0,12X,A3,I5

Col 1- 8	"PROBKGND"
Col 9-10	Blank
Col 11-20	Probability of kill against enemy aircraft parked in open per penetrating TAC fighter attacking aircraft*
Col 21-30	Probability of kill against sheltered enemy aircraft per penetrating TAC fighter attacking aircraft*
Col 31-40	Number of kills against enemy air defense fire units per penetrating TAC fighter attacking SAM**
Col 41-50	Probability of TAC fighter aircraft killed in AR/I role/sortie/air defense fire unit***
Col 51-60	Probability of TAC fighter aircraft killed in CA role/sortie/air defense fire unit***
Col 61-72	Optional comments
Col 73-75	Sequence label
Col 76-80	Sequence number

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*See para 7-2e in Volume I for algorithm employing these probability factors.

**See para 7-2e in Volume I for explanation of the use of this probability factor.

***See para 7-2d in Volume I for explanation and algorithm employing these probability factors.

FILLER AIRCRAFT COUNT CARD

FORMAT	2A4,2X,I5,57X,A3,I5
Col 1- 8	"FCARDKNT"
Col 9-10	Blank
Col 11-15	Count of "ACFILLER" cards to follow this card
Col 16-72	Optional comments
Col 73-75	Sequence label
Col 76-80	Sequence number

FILLER AIRCRAFT SPECIFICATION CARD

FORMAT 2A4,2X,I5,5X,5F10.0,2X,A3,I5

Col 1- 8	"ACFILLER"
Col 9-10	Blank
Col 11-15	Theater cycle aircraft on this card will come into operation
Col 16-20	Blank
Col 21-30	Quantity of attack fighters on primary bases
Col 31-40	Quantity of attack fighters on sanctuary bases
Col 41-50	Quantity of air defense fighters on primary bases
Col 51-60	Quantity of high altitude SAMs
Col 61-70	Quantity of low altitude SAMs
Col 71-72	Optional comments
Col 73-75	Sequence label
Col 76-80	Sequence number

Note:

The preceding card has specified the quantity of these cards required to schedule aircraft replenishment/reinforcement. "ACFILLER" cards must be in ascending order by theater cycle.

AIR SECTION ERROR MESSAGES/DIAGNOSTICS

"***ILLEGAL USAGE OPTION"

Two options permitted are: "NOAIRMOD" and "AIRMOD," both must begin in Col 11.

"***ILLEGAL PRINT OPTION"

Two options permitted are: "SUPPRESS" and "PRINT," both must begin in Col 21.

"***NEITHER SIDE HAS AIRCRAFT"

The sum of attack fighter on primary bases + attack fighters on sanctuary bases + sweep fighters on primary bases = 0.

"***ALLOCATION SUM NOT EQUAL TO ONE"

The sum of the percentages for initial efforts in armed recon/intradiction (AR/I), counterair (CA), and close air support (CAS) must equal one (1).

"***ALLOCATION CHANGE ENTRY OUT OF RANGE"

The allocation change increments sum to greater than 100 percent.

"***SUM OF ENTRIES IN COLUMN XX NE ONE"

The sum of any changes column on each "ALLOCHNG" card for AR/I + CA + CAS = 0.

"***PROBABILITY OUT OF RANGE"

The probability(ies) for air-to-air or air-to-ground kill is (are) either less than zero (0) or greater than one (1).

"***LOW-ALTITUDE SAM CONVERSION FACTOR MAY NOT BE ZERO"

The conversion factor for low-altitude SAM to ADA fire unit is zero.
"***FILLER CARDS NOT IN ASCENDING CYCLE ORDER"

The sequence of these "ACFILLER" cards must be in ascending theater cycles.

"***THEATER CYCLE OUT OF RANGE"

The theater cycle specified on the "ACFILLER" card, Col 11-15, is greater than that specified for simulation duration on the "RUNLIMIT" card, Col 11-15.

"***WARNING - ZERO EXPENDITURE RATE"

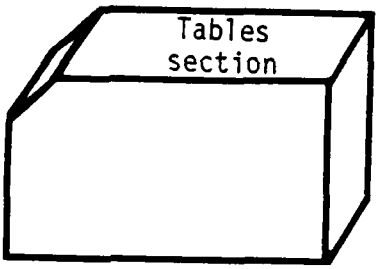
The expenditure rate for the SAM and/or ADA fire unit is zero.

"***NEGATIVE VALUE ON ABOVE CARD"

This error message is generated by all the following card inputs:

1.	Label = "INITAC"	All values must be ≥ 0.
2.	Label = "INITADA"	All values must be ≥ 0.
3.	Label = "INITALFR"	All values must be ≥ 0.
4.	Label = "ALLOBNDS"	All values must be ≥ 0.
5.	Label = "ALHIBNDS"	All values must be ≥ 0.
6.	Label = "ATRTTHRS"	All values must be ≥ 0.
7.	Label = "FBMVTHRS"	All values must be ≥ 0.
8.	Label = "FAENTHRS"	All values must be ≥ 0.
9.	Label = "SMCNVFCT"	All values must be ≥ 0.
10.	Label = "ADSMEXPR"	All values must be ≥ 0.
11.	Label = "RISKDATA"	All values must be ≥ 0.
12.	Label = "CASDATA"	All values must be ≥ 0.
13.	Label = "CASIFPS"	All values must be ≥ 0.
14.	Label = "ACFILLER"	All values must be ≥ 0.

TABLES SECTION



The Tables Section contains tables illustrated in Figure 1-6 that control or modify, as a function of engagement type, the relative effectiveness of the forces. Each force may contain several components that produce varying effectiveness against different opponents on different terrain and postures. The following formats and descriptions are included:

Table Section Deck Structure, Figure 1-6
Sample Table Input Data Card Listing
Tables Section Card
Estimation Thresholds
Outcome Thresholds
Arty Table Card
FEBA Movement Cards
Decimated Red Division Factors
Table Section Error Messages/Diagnostics Description

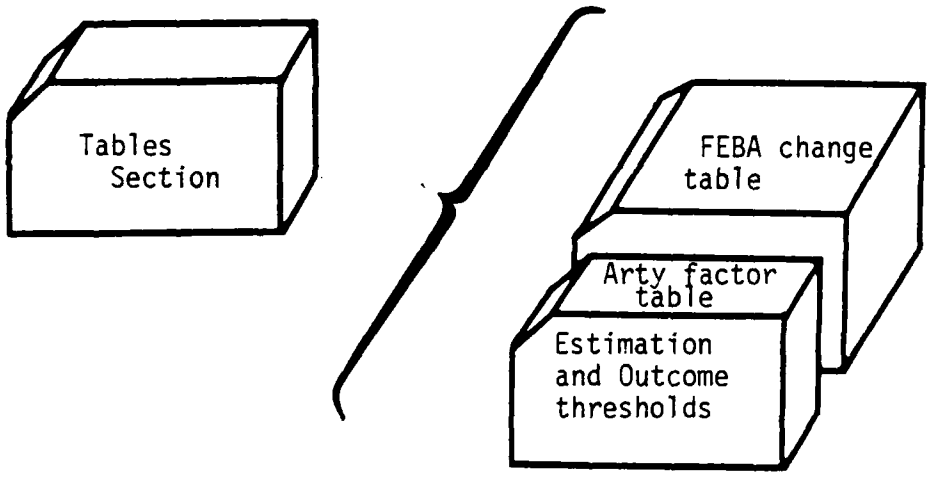


Figure 1-6. Table Section Deck Structure

SECTION	TABLES		SEQIGNOR		S								TCF	0
ESTHRSHD	4.00	2.0	4.00	2.00	4.00	2.00	4.00	2.00						
ESTHRSHD	4.00	1.50	4.00	1.50	4.00	1.50	0.80	.30						
OUTHRSHD	75.0	92.5	97.5	72.5	82.5	90.0	95.0							
OUTHRSHD	70.0	80.0	90.0	72.5	82.5	90.0	95.0							
OUTHRSHD	70.0	80.0	90.0	72.5	82.5	90.0	95.0							
OUTHRSHD	75.0	92.5	97.5	72.5	82.5	90.0	95.0							
C3FACTOR	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	0.90	0.90	BLU	
C3FACTOR	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	BLU	
C3FACTOR	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	BLU	
C3FACTOR	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	BLU	
C3FACTOR	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	BLU	
C3FACTOR	5.70	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	BLU	
C3FACTOR	6.65	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	BLU	
C3FACTOR	7.20	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	BLU	
C3FACTOR	8.10	9.00	9.00	9.00	9.00	9.00	9.00	9.00	9.00	9.00	9.00	9.00	BLU	
C3FACTOR	8.50	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	BLU	
C3FACTOR	9.35	10.5	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	BLU	
C3FACTOR	9.60	11.4	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	BLU	
C3FACTOR	9.75	12.4	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	BLU	
C3FACTOR	10.5	13.3	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	BLU	
C3FACTOR	11.3	14.3	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	BLU	
C3FACTOR	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	0.90	0.90	RED	
C3FACTOR	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	RED	
C3FACTOR	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	RED	
C3FACTOR	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	RED	
C3FACTOR	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	RED	
C3FACTOR	5.70	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	RED	
C3FACTOR	6.65	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	RED	
C3FACTOR	7.20	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	RED	
C3FACTOR	8.10	9.00	9.00	9.00	9.00	9.00	9.00	9.00	9.00	9.00	9.00	9.00	RED	
C3FACTOR	8.50	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	RED	
C3FACTOR	9.35	10.5	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	RED	
C3FACTOR	9.60	11.4	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	RED	
C3FACTOR	9.75	12.4	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	RED	
C3FACTOR	10.5	13.3	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	RED	
C3FACTOR	11.3	14.3	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	RED	
FEBACHNG	10	35	100	175	375									
FEBACHNG	5	25	65	130	325									
FEBACHNG	0	15	45	110	200									
FEBACHNG	0	0	1	1	1									
REDECMTN	30	30	5	65	1	7	15	33						

TABLES SECTION CARD

FORMAT 2A4,2X,2A4,2X,2A4,2X,I5,37X,A3,I5

Col 1- 8	"SECTION"
Col 9-10	Blank
Col 11-18	"TABLES"
Col 19-20	Blank
Col 21-28	"SEQCOMNT" ignore out of sequence cards, but comment "SEQABORT" abort preprocessor run if Col 76-80 not in ascending sequence "SEQIGNOR" ignore and do not comment on out of sequence cards
Col 29-30	Optional comments
Col 31-35	Logical input unit for this section of data
Col 36-72	Optional comments
Col 73-75	Sequence label
Col 76-80	Sequence number

ESTIMATION OUTCOME THRESHOLDS CARD

FORMAT	2A4,2X,8F5.2,22X,A3,I5
Col 1- 8	"ESTHRSHD"
Col 9-10	Blank
Col 11-15	An expected attacker/defender ratio greater than or equal to this entry will be a win for the attacker in a (delay) mission
Col 16-20	A ratio less than the win entry above, but greater than or equal to this entry, is a draw in a delay mission. Less than this entry is a loss for the attacker in a (delay) mission
Col 21-25	(Prepared defense) as above Col 11-15
Col 26-30	(Prepared defense) as above Col 16-20
Col 31-35	(Hasty defense) as above Col 11-15
Col 36-40	(Hasty defense) as above Col 16-20
Col 41-50	Blank
Col 51-72	Optional comments
Col 73-75	Sequence label
Col 76-80	Sequence number

Notes:

See para 6-2a and 6-3 of Volume I for more information on these division decision thresholds.

Card required for Blue and Red--first card Blue, second card Red.

ASSESSMENT OUTCOME THRESHOLDS CARD (1)

FORMAT 2A4,2X,8F5.2,22X,A3,I5

Col 1- 8	"OUTHRESH"
Col 9-10	Blank
Col 11-15	Percent of delaying force surviving below which resistence to the attack is scattered.*
Col 16-20	Percent of delaying force surviving below which resistence to the attack is moderate.
Col 21-25	Percent of delaying force surviving below which resistence to the attack is strong.
Col 26-30	Percent of attacking force surviving below which pressure to continue attack against a delaying force is very low.
Col 31-35	Percent of attacking force surviving below which pressure to continue attack against a delaying force is low.
Col 36-40	Percent of attacking force surviving below which pressure to continue attack against a delaying force is moderate.
Col 41-45	Percent of attacking force surviving below which pressure to continue the attck against a delaying force is high.
Col 46-50	Blank
Col 51-72	Optional comments
Col 73-75	Sequence label
Col 76-80	Sequence number

*Values are percent (i.e., 98.0 not .98).

ASSESSMENT OUTCOME THRESHOLDS CARD (2)

FORMAT 2A4,2X,8F5.2,22X,A3,I5

Col 1- 8	"OUTHRESH"
Col 9-10	Blank
Col 11-15	Same as Card 1 for prepared defense
Col 16-20	Same as Card 1 for prepared defense
Col 21-25	Same as Card 1 for prepared defense
Col 26-30	Same as Card 1 for prepared defense
Col 31-35	Same as Card 1 for prepared defense
Col 36-40	Same as Card 1 for prepared defense
Col 41-45	Same as Card 1 for prepared defense
Col 46-50	Blank
Col 51-72	Optional comments
Col 73-75	Sequence label
Col 76-80	Sequence number

ASSESSMENT OUTCOME THRESHOLDS CARD (3)

FORMAT 2A4,2X,8F5.2,22X,A3,I5

Col 1- 8	"OUTHRESH"
Col 9-10	Blank
Col 11-15	Same as Card 1 for hasty defense
Col 16-20	Same as Card 1 for hasty defense
Col 21-25	Same as Card 1 for hasty defense
Col 26-30	Same as Card 1 for hasty defense
Col 31-35	Same as Card 1 for hasty defense
Col 36-40	Same as Card 1 for hasty defense
Col 41-45	Same as Card 1 for hasty defense
Col 46-50	Blank
Col 51-72	Optional comments
Col 73-75	Sequence label
Col 76-80	Sequence number

ASSESSMENT OUTCOME THRESHOLD CARD (4)

FORMAT	2A4,2X,8F5.2,22X,A3,I5
Col 1- 8	"OUTHRESH"
Col 9-10	Blank
Col 11-15	Same as Card 1 for withdrawal*
Col 16-20	Same as Card 1 for withdrawal
Col 21-25	Same as Card 1 for withdrawal
Col 26-30	Same as Card 1 for withdrawal
Col 31-35	Same as Card 1 for withdrawal
Col 36-40	Same as Card 1 for withdrawal
Col 41-45	Same as Card 1 for withdrawal
Col 46-50	Blank
Col 51-72	Optional comments
Col 73-75	Sequence label
Col 76-80	Sequence number

---

*A force withdrawling when it has a delay mission and 7:1 (A/D) force ratio.

ARTILLERY COORDINATION DEGRADATION FACTOR TABLE CARD

FORMAT 2A4,2X,12F5.0,2X,A3,I5

Col 1- 8	"C3FACTOR"
Col 9-10	Blank
Col 11-15	Effective arty bns for: 1 arty bn in support of 1 maneuver bn
Col 16-20	Effective arty bns for: 1 arty bn in support of 2 maneuver bns
Col 21-25	Effective arty bns for: 1 arty bn in support of 3 maneuver bns
Col 26-30	Effective arty bns for: 1 arty bn in support of 4 maneuver bns
Col 31-35	Effective arty bns for: 1 arty bn in support of 5 maneuver bns
Col 36-40	Effective arty bns for: 1 arty bn in support of 6 maneuver bns
Col 41-45	Effective arty bns for: 1 arty bn in support of 7 maneuver bns
Col 46-50	Effective arty bns for: 1 arty bn in support of 8 maneuver bns
Col 51-55	Effective arty bns for: 1 arty bn in support of 9 maneuver bns
Col 56-60	Effective arty bns for: 1 arty bn in support of 10 maneuver bns
Col 61-65	Effective arty bns for: 1 arty bn in support of 11 maneuver bns
Col 66-70	Effective arty bns for: 1 arty bn in support of 12 maneuver bns
Col 71-72	Blank
Col 73-75	Sequence label
Col 76-80	Sequence number

Notes:

There are fifteen (15) cards in the C3FACTOR table. The "C3FACTOR" cards give the number of effective artillery bns for the number of supporting arty bns ranging from 1 to 15, and one each card the number of maneuver bns being supported. (1st card is one supporting arty bn, 2d card is two arty bns, etc.) these are 15 cards for up to 15 arty bns. The first 15 cards are for Blue while the next 15 are for Red.

See para 5-3c of Volume I for explanation of how this table is used to determine effective artillery battalions.

FEBA MOVEMENT CARD (1)

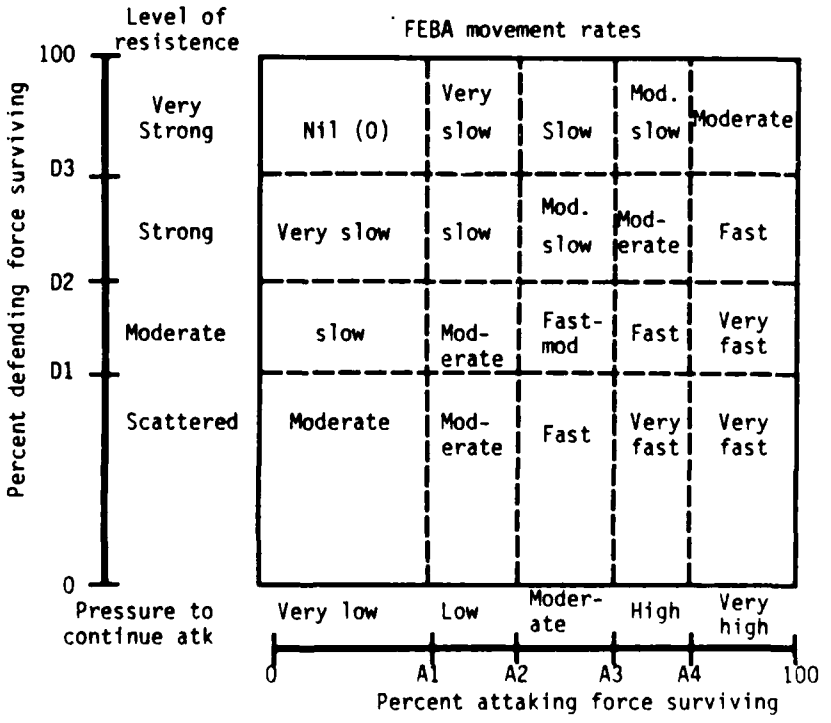
FORMAT 2A4,2X, 5I5), 37X, A3, I5

Col 1- 8	"FEBACHNG"
Col 9-10	Blank
Col 11-15	Very slow FLOT movement - A terrain
Col 16-20	Slow FLOT movement - A terrain
Col 21-25	Moderate FLOT movement - A terrain
Col 26-30	Fast FLOT movement - A terrain
Col 31-35	Very fast FLOT movement - A terrain
Col 36-72	Blank
Col 73-75	Sequence label
Col 76-80	Sequence number

Notes:

All FEBA change values are hectometers per division cycle.

A FEBA change table is constructed as a function of the OUTHRESH values as shown in the following diagram:



FEBA MOVEMENT CARD (2)

FORMAT 2A4,2X,6,2I5,37X,A3,I5

Col 1- 8	"FEBACHNG"
Col 9-10	Blank
Col 11-15	Very slow FLOT movement - B terrain
Col 16-20	Slow FLOT movement - B terrain
Col 21-25	Moderate FLOT movement - B terrain
Col 26-30	Fast FLOT movement - B terrain
Col 31-35	Very fast FLOT movement - B terrain
Col 36-72	Blank
Col 73-75	Sequence label
Col 76-80	Sequence number

Note:

All FEBA change values are hectometers per division cycle.

FEBA MOVEMENT CARD (3)

FORMAT 2A4,2X,2I5,37X,A3,I5

Col 1- 8	"FEBACHNG"
Col 9-10	Blank
Col 11-15	Very slow FLOT movement - C terrain
Col 16-20	Slow FLOT movement - C terrain
Col 21-25	Moderate FLOT movement - C terrain
Col 26-30	Fast FLOT movement - C terrain
Col 31-35	Very fast FLOT movement - C terrain
Col 36-72	Blank
Col 73-75	Sequence label
Col 76-80	Sequence number

Note:

All FEBA change values are hectometers per division cycle.

FEBA MOVEMENT CARD (4)

FORMAT 2A4,2X,5I5,37X,A3,I5

Col 1- 8	"FEBACHNG"
Col 9-10	Blank
Col 11-15	Very slow FLOT movement - D terrain
Col 16-20	Slow FLOT movement - D terrain
Col 21-25	Moderate FLOT movement - D terrain
Col 26-30	Fast FLOT movement - D terrain
Col 31-35	Very fast FLOT movement - D terrain
Col 36-72	Blank
Col 73-75	Sequence label
Col 76-80	Sequence number

Note:

All FEBA change values are hectometers per division cycle.

DECIMATED RED DIVISION CARD

FORMAT	2A4,2X,8I5,22X,A3,I5
Col 1- 8	"REDECMTN"
Col 9-10	Blank
Col 11-15	"attack threshold" If the parent Red corps has an attack mission, any subordinate division with a state less than this entry will be considered decimated and withdrawn from the front. A minimum of one division in each corps will always remain on the front regardless of state.
Col 16-20	"defend threshold" If the parent Red corps has a defend mission, any subordinate division with a state less than this entry will be considered decimated and withdrawn from the front.
Col 21-25	Minimum time (army cycles) a decimated division must remain withdrawn before being considered for recommitment to front line.
Col 26-30	Minimum state a decimated division must achieve before being considered for front line.
Col 31-35	Switch to control resupply of decimated Red divisions. 0 = no priority of resupply. 1 = men and equipment go to only decimated divisions with the strongest (state) division getting priority.
Col 36-40	Maximum time (army cycles) a decimated division can remain withdrawn before being deactivated and stripped of assets.
Col 41-45	Time (army cycles, beginning at D-day) that the Red division rebuilding pool will operate and unit replacement will be used. After this time has expired, no further Red divisions will enter the rebuilding pool, and individual replacement will be used.
Col 46-50	Maximum percentage of the number of Red divisions in theater allowed in the rebuilding pool at one time. (If this entry is zero or blank, one hundred percent is assumed as a default.)
Col 51-72	Optional comments
Col 73-75	Sequence label
Col 76-80	Sequence number

Note:

See para 4-2 in Volume I for more information on the representation of Red division replacement.

TABLE SECTION ERROR MESSAGES/DIAGNOSTICS

"***C3 FACTOR TABLE APPEARS INCONSISTENT PLEASE RECHECK VALUES"

The value input into the C^3 table is the effective quantity of artillery units being utilized by "X" (1-12) combat units being supported by "Y" (1-15) artillery units. It has been detected that less effective artillery units are being input for larger quantities of either combat or artillery units than was previously defined for some smaller quantity of either combat or artillery units.

"***ENTRY XX ON ABOVE CARD IS INVALID"

An entry on the "C3FACTOR" card is less than or equal to zero (0).

CHAPTER 2

MESSAGE DESCRIPTIONS

2-1. GENERAL ERROR MESSAGE/DIAGNOSTIC DESCRIPTIONS. There are three error message/diagnostic routines that are pertinent to and useful in each of the six major sections. Described in succeeding pages, these are as follows:

a. Section card error messages/diagnostics.

b. Sequence check error messages/diagnostics.

c. Data subroutine error messages/diagnostics.

2-2. SECTION CARD ERROR MESSAGES/DIAGNOSTICS

"***_____ SECTION SHOULD BE NEXT"

An input section has appeared prior to expected point in input deck.

"***ILLEGAL SEQUENCE OPTION"

Check "SECTION" card, Cols 21-28. Only: 1. "SEQCOMNT," 2. "SEQABORT," 3. "SEQIGNOR" are permitted options.

"***SECTION INPUT UNIT OUT OF RANGE"

Input unit has been defined as either less than 0 or greater than 99.

"***ABOVE CARD OUT OF SEQUENCE"

If, on the "SECTION" card, the user has requested either "SEQCOMNT" or "SEQABORT," the above message is generated when a sequence number (columns 73-80) has been encountered which is not greater than the preceding card's sequence number.

"***IGNORING SEQUENCE ERRORS HEREAFTER FOR THIS SECTION ONLY"

If, on the "SECTION" card, the user has requested "SEQCOMNT," a maximum of 20 such comments on out-of-sequence cards will be generated within any one section of the input data.

CHAPTER 3

CEM VI REPORTS

3-1. REPORT GENERATOR. The Report Generator is a program separate from the CEM simulation program. The Report Generator processes a CEM output file to provide a series of unit tactical reports, Blue battalion engagement frequency reports, FEBA location reports, command and control reports, logistical reports, Blue personnel reports, loss versus cause reports, theater tactical summaries, and air battle summaries. The Report Generator also writes a Combat Unit Trace file (to logical unit 20), and the Automated Data Display of CEM Outputs (ADDCOP) files (to the following logical units: 18--Blue logistics by partition; 23--summary data and engagement frequencies; 25--FEBA locations; 26--Blue nonpartitioned logistics; 27--Red logistics; 28--tactical aircraft data) for use by CEM auxiliary post-processors.

3-2. UNIT TACTICAL REPORTS

a. The first page of the unit tactical reports, shown in Figure 3-1, gives the reporting cycle (frequency) of several of these reports, as well as the duration of the simulation, and of the corp, Army, and theater cycles employed in a particular scenario.

b. There are two presentations of data in the unit tactical reports as displayed in Figures 3-2 and 3-3. The initial presentation is labeled "Division Cycle 0" and gives the initial location, authorized troop strength, supplies, and numbers of major weapons assigned to the combat units, with resolution down to brigade on the Blue side and division on the Red side. The second presentation is illustrated in Figure 3-3 and is reported in each division cycle or every nth division cycle, as specified by gamer input. This presentation includes the location, mission, and status of each combat unit after the engagement assessment and replenishment for that division cycle. The entries in the unit tactical reports are described in detail as follows.

(1) Echelon. The organizational level for each designated component of the theater force. The identifiers "CV" and "CAV" indicate that the location, state, and mission data presented on that line apply to the corps (or division), while other data on the line apply only to the corps (or division) **cavalry unit.**

(2) FEBA Band. Low--the unit's northernmost minisector. High--the unit's southernmost minisector. These boundaries apply to the entire divisions and corps rather than to the cavalry units. The notation "RESERVE" indicates that the unit was in reserve, rather than employed along the FEBA, for the given cycle.

INPUT SUMMARY

CAV. EQUIPMENT INTERCHANGEBILITY **UNCLASSIFIED**

USER SPECIFICATIONS

DURATION

THEATER CYCLES IN GAME	4
ARMY CYCLES PER THEATER CYCLE	2
CORPS CYCLES PER ARMY CYCLE	2
DIVISION CYCLES PER CORPS CYCLE	2

TACTICAL REPORTS

BLUE AND RED UNIT REPORT EVERY DIVISION CYCLE
BLUE BATTALION ENGAGEMENT FREQUENCY REPORT EVERY THEATER CYCLE

END OF COMBAT REPORTS

THEATER TACTICAL SUMMARY EVERY THEATER CYCLE
AIR BATTLE SUMMARY EVERY THEATER CYCLE

FEBA LOCATION REPORTS

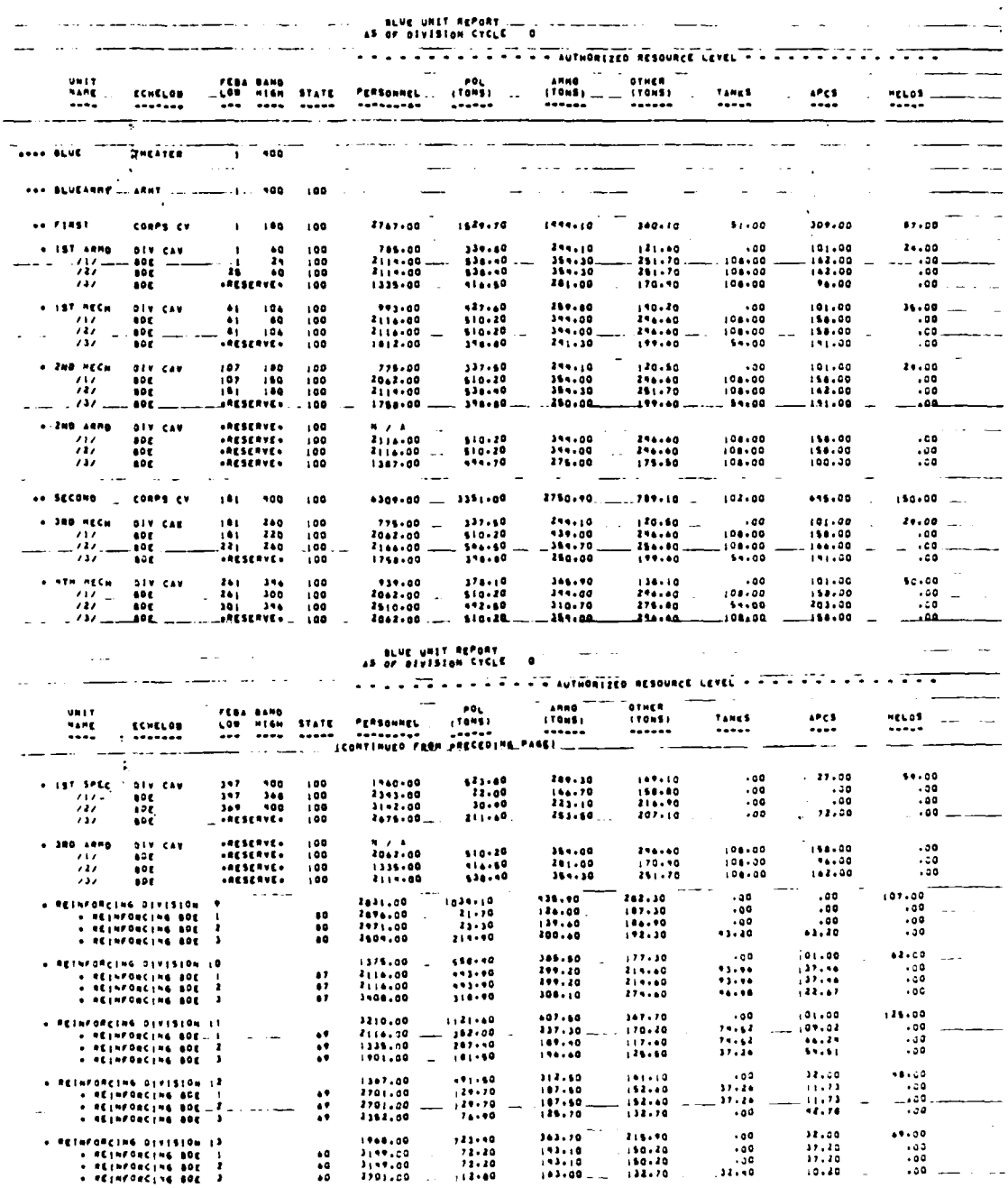
FEBA MAP EVERY DIVISION CYCLE 10 MINISECTORS PER LINE
FEBA TABLE EVERY DIVISION CYCLE

LOGISTICAL REPORTS

COMBAT UNIT LOGISTIC REPORT EVERY DIVISION CYCLE
THEATER LOGISTIC REPORT EVERY THEATER CYCLE

COMMAND AND CONTROL REPORTS

Figure 3-1. Example of CEM Contents Summary



BLUE UNIT REPORT
AS OF DIVISION CYCLE 0

UNIT NAME	ECHELOB	FEBA BAND LOW	FEBA BAND HIGH	STATE	AUTHORIZED RESOURCE LEVEL PERSONNEL	POL (TONS)	AMMO (TONS)	OTHER (TONS)	TANKS	APCS	HELOS
**** BLUE	THEATER	1	400								
*** BLUEARMY	ARMY	1	400	100							
** FIRST	CORPS CV	1	100	100	27467.00	1529.70	1999.10	340.10	51.00	309.00	87.00
* 1ST ARMD	DIV CAV	1	40	100	785.00	330.60	294.10	121.60	.00	101.00	24.00
/1/	BDE	1	24	100	2114.00	538.40	354.30	251.70	108.00	162.00	.00
/2/	BDE	25	40	100	2114.00	538.40	354.30	251.70	108.00	162.00	.00
/3/	BDE		*RESERVE*	100	1335.00	416.50	281.00	170.90	108.00	96.00	.00
* 1ST MECH	DIV CAV	61	104	100	993.00	427.60	289.80	140.20	.00	101.00	36.00
/1/	BDE	61	80	100	2116.00	510.20	344.00	296.60	108.00	158.00	.00
/2/	BDE	81	104	100	2116.00	510.20	344.00	296.60	108.00	158.00	.00
/3/	BDE		*RESERVE*	100	1812.00	398.80	291.30	199.60	54.00	191.00	.00
* 2ND MECH	DIV CAV	107	180	100	775.00	337.50	294.10	120.50	.00	101.00	24.00
/1/	BDE	107	150	100	2062.00	510.20	354.00	296.60	108.00	158.00	.00
/2/	BDE	131	180	100	2114.00	538.40	354.30	251.70	108.00	162.00	.00
/3/	BDE		*RESERVE*	100	1758.00	398.80	250.00	199.60	54.00	191.00	.00
* 2ND ARMD	DIV CAV		*RESERVE*	100	N / A						
/1/	BDE		*RESERVE*	100	2114.00	510.20	344.00	296.60	108.00	158.00	.00
/2/	BDE		*RESERVE*	100	2114.00	510.20	344.00	296.60	108.00	158.00	.00
/3/	BDE		*RESERVE*	100	1387.00	494.70	276.00	175.50	108.00	100.30	.00
** SECOND	CORPS CV	181	400	100	6309.00	3351.00	2750.90	789.10	102.00	695.00	150.00
* 3RD MECH	DIV CAV	181	260	100	775.00	337.50	294.10	120.50	.00	101.00	24.00
/1/	BDE	181	220	100	2062.00	510.20	439.00	296.60	108.00	158.00	.00
/2/	BDE	221	260	100	2166.00	546.50	384.70	256.80	108.00	166.00	.00
/3/	BDE		*RESERVE*	100	1758.00	398.80	250.00	199.60	54.00	191.00	.00
* 4TH MECH	DIV CAV	261	346	100	939.00	378.10	346.90	138.10	.00	101.00	30.00
/1/	BDE	261	300	100	2062.00	510.20	344.00	296.60	108.00	158.00	.00
/2/	BDE	301	346	100	2510.00	492.60	310.70	276.80	54.00	203.00	.00
/3/	BDE		*RESERVE*	100	2062.00	510.20	284.00	254.60	108.00	158.00	.00

BLUE UNIT REPORT
AS OF DIVISION CYCLE 0

UNIT NAME	ECHELOB	FEBA BAND LOW	FEBA BAND HIGH	STATE	AUTHORIZED RESOURCE LEVEL PERSONNEL	POL (TONS)	AMMO (TONS)	OTHER (TONS)	TANKS	APCS	HELOS
(CONTINUED FROM PRECEDING PAGE)											
* 1ST SPEC	DIV CAV	347	400	100	1960.00	823.60	289.30	149.10	.00	27.00	59.00
/1/	BDE	347	368	100	2343.00	22.00	144.70	158.80	.00	.00	.00
/2/	BDE	369	400	100	3142.00	30.60	223.10	216.90	.00	.00	.00
/3/	BDE		*RESERVE*	100	2675.00	211.60	253.60	207.10	.00	72.00	.00
* 3RD ARMD	DIV CAV		*RESERVE*	100	N / A						
/1/	BDE		*RESERVE*	100	2062.00	510.20	354.00	296.60	108.00	158.00	.00
/2/	BDE		*RESERVE*	100	1335.00	416.50	281.00	170.90	108.00	96.00	.00
/3/	BDE		*RESERVE*	100	2114.00	538.40	354.30	251.70	108.00	162.00	.00
* REINFORCING DIVISION	9				2831.00	1030.10	438.90	262.30	.00	.00	107.00
* REINFORCING BDE	1			80	2896.00	21.70	126.00	187.30	.00	.00	.00
* REINFORCING BDE	2			80	2971.00	23.30	139.60	186.90	.00	.00	.00
* REINFORCING BDE	3			80	3604.00	214.90	200.60	192.30	43.20	63.20	.00
* REINFORCING DIVISION	10				1375.00	456.40	386.80	177.30	.00	101.00	62.00
* REINFORCING BDE	1			87	2116.00	443.90	299.20	216.60	93.96	137.46	.00
* REINFORCING BDE	2			87	2116.00	443.90	299.20	216.60	93.96	137.46	.00
* REINFORCING BDE	3			87	3408.00	318.90	308.10	274.60	46.98	122.67	.00
* REINFORCING DIVISION	11				3210.00	1121.60	407.60	367.70	.00	101.00	125.00
* REINFORCING BDE	1			69	2116.70	282.00	337.30	170.20	74.52	109.02	.00
* REINFORCING BDE	2			69	1335.00	287.40	169.40	117.60	74.52	66.24	.00
* REINFORCING BDE	3			69	1901.00	181.60	196.60	126.60	37.26	54.61	.00
* REINFORCING DIVISION	12				1387.00	491.60	312.60	161.10	.00	32.00	48.00
* REINFORCING BDE	1			69	2701.00	129.70	187.60	152.60	37.26	11.73	.00
* REINFORCING BDE	2			69	2701.00	129.70	187.60	152.60	37.26	11.73	.00
* REINFORCING BDE	3			69	2382.00	76.90	126.70	132.70	.00	42.78	.00
* REINFORCING DIVISION	13				1968.00	723.40	363.70	215.90	.00	32.00	69.00
* REINFORCING BDE	1			60	3149.00	72.20	193.10	150.20	.00	37.20	.00
* REINFORCING BDE	2			60	3149.00	72.20	193.10	150.20	.00	37.20	.00
* REINFORCING BDE	3			60	2701.00	12.60	183.00	132.70	32.40	10.20	.00

Figure 3-2. Time Zero Blue Unit Tactical Report

RED UNIT REPORT
AS OF DIVISION CYCLE 11

UNIT NAME	ECHELON	FEBA LOW	FEBA HIGH	STATE	MISSION	- - - - ASSETS ON HAND AFTER RESUPPLY - - - - PERSONNEL	TANKS	APCS	HELOS
					(CONTINUED FROM PRECEDING PAGE)				
• SM7-19	DIV	155	158	97	ATTACK	6032.70	65.60	300.96	3.46
• SM14-73	DIV	159	162	91	ATTACK	6908.60	191.40	433.04	6.68
•• **CC 1	CORPS	163	184	64	ATTACK				
• ST7-12	DIV	163	169	99	ATTACK	5312.50	126.93	139.63	3.71
• ST9-15	DIV	170	173	98	ATTACK	5161.40	139.72	154.63	3.90
• SM4-10	DIV	178	184	93	ATTACK	5442.30	58.86	304.01	3.92
• SM13-70	DIV	174	177	87	ATTACK	6823.50	201.18	381.37	6.64
• ST22-74	DIV	*RESERVE*		98	*RESERVE*	4705.80	316.96	202.56	7.46
••• ARMY-10	ARMY	185	273	50	DEFEND				
•• CORP22	CORPS	185	240	54	DEFEND				
• SM8-17	DIV	185	225	97	DEFEND	6242.80	59.78	297.61	3.70
• GM2-38	DIV	*RESERVE*		39	*RESERVE*	6038.30	17.56	321.45	3.33
• GT1-39	DIV	226	240	77	DEFEND	5497.30	245.11	226.91	5.73
•• CORP23	CORPS	241	273	90	DEFEND				
• SM9-22	DIV	241	273	90	DEFEND	5756.80	42.97	280.42	3.09

UNIT NAME	ECHELON	ARMY	STATE	CYCLES	- - - - QUANTITIES ON HAND - - - - PERSONNEL	TANKS	APCS	
• ST11-24	DECIMATED DIVISION	3	41	3	6773.40	79.66	169.67	7.57
• ST5-8	DECIMATED DIVISION	1	76	3	7665.60	218.78	454.46	7.96
• ST18-63	DECIMATED DIVISION	1	74	2	7232.10	232.75	132.38	7.11
• GT2-35	DECIMATED DIVISION	1	92	2	6162.10	293.07	283.47	7.77
• ST4-7	DECIMATED DIVISION	1	42	1	8639.60	95.12	137.67	3.68
• GM1-37	DECIMATED DIVISION	3	52	1	8206.00	15.23	429.03	3.14
• ST10-23	DECIMATED DIVISION	3	54	1	8442.30	140.42	164.76	5.68

Figure 3-3. Sample Page of Red Unit Tactical Report

(3) State. The average state of all on-line and reserve maneuver battalions/regiments included in a given organization. All maneuver battalions in a brigade are considered to be at the same state as the brigade. Brigade state is defined as 100 times the current combat capability of the brigade divided by the brigade's full-strength combat capability in a meeting engagement. A brigade's combat capability is the sum of firepower available from all the sources listed in the brigade status file and constrained, where appropriate, by supply shortages. Current status file values, which vary between division cycles, are used to compute a brigade's current combat capability. Full-strength (authorized) values, which remain constant throughout a particular simulation, are used to compute a brigade's full-strength combat capability. Regiments of those Red divisions in the decimation pool are not included at the corps and Army echelons. For Blue, at the division, corps, and Army echelons, the average state does not include the state of the maneuver battalions in the cavalry units.

(4) Mission. The mission (attack, defend, delay, or reserve) selected for the particular organization during the given division cycle. The "N/A" notation reflects the fact that a Blue division does not select a division mission but does assign its subordinate brigades missions.

(5) Personnel. Does not include the crews of tanks, light armor, and helicopters.

(6) Decimated Division

(a) Army. The parent Army headquarters from which the Red division was withdrawn for rebuilding. The number of this Army headquarters is multiplied by 50 when the division has been deactivated (stripped of its resources).

(b) Cycles. The number of division cycles that a particular Red division has been in the rebuilding pool.

3-3. ENGAGEMENT FREQUENCY REPORTS. The engagement frequency reports give the frequency of occurrence of the nine types of engagement among the Blue combat units. The reporting cycle for these reports is specified on the Report Options Card.

BAD	Blue attacks; Red delays.
BAPD	Blue attacks; Red defends from prepared positions.
BAHD	Blue attacks; Red defends from hasty positions.
Meeting engagement	Blue attacks; Red attacks.

RAHD	Blue attacks; Red defends from hasty positions.
RAPD	Red attacks; Blue defends from prepared positions.
RAD	Red attacks; Blue delays.
Static	Neither side attacks; i.e., Blue's mission may be either defend or delay while, concurrently, Red's mission is either defend or delay.
Reserve	Blue battalions in brigade assigned a reserve mission.
Blue battalions (all types)	The number of Blue maneuver battalions participating in a given type of engagement during a division cycle, summed for the n corps cycles. (That is, a count of 1 means 1 bn in that of engagement for 1 division cycle.) The column figures show the count of such incidents for 2nd division cycles. Battalions in cavalry units are not included. The total of this column divided by 2nd will equal the average number of maneuver battalions assigned to divisional brigades in the theater force in a division cycle of this theater cycle.
Red divisions/ Blue battalions	Average number of Red Division faced by each Blue maneuver battalion for each type of engagement during the theater cycle.
Engagement	Fraction of all incidents during the theater cycle that were of the given engagement type. (Sample calculation: For the data shown in Figure 3-4, adding up the "BLUE BNS (ALL TYPES)" column gives a total of 992 incidents of all types; dividing this into the 131.7 incidents of type BAPD gives an engagement frequency of .133 for this engagement type 131.7/992 = .133).
Cumulative	Columns have the same definitions as presented above except that values are cumulative; i.e., they apply from division cycle 1 through the end of the theater cycle of interest. Thus, "engagement frequency" for the "CUMULATIVE" side of the report is an occurrence profile for the war to date.

BLUE PARTITION 1

BLUE BN ENGAGEMENT FREQUENCY REPORT
AT END OF CORPS CYCLE 15

ENGAGEMENT TYPE	CURRENT CORPS CYCLE: BLUE BNS (ALL TYPES)	CURRENT CORPS CYCLE: RED DIVS/ BLUE BN	CURRENT CORPS CYCLE: ENGAGEMENT FREQUENCY	CUMULATIVE: BLUE BNS (ALL TYPES)	CUMULATIVE: RED DIVS/ BLUE BN	CUMULATIVE: ENGAGEMENT FREQUENCY
1 - BAD	.0	.00	.000	.0	.00	.000
2 - BAPD	.0	.00	.000	.0	.00	.000
3 - BAMD	.0	.00	.000	.0	.00	.000
4 - MEETNG	.0	.00	.000	.0	.00	.000
5 - RAMD	8.0	.07	.036	152.1	.19	.052
6 - RAPD	17.6	.19	.079	466.9	.21	.161
7 - RAD	.0	.00	.000	97.5	.48	.034
8 - STATIC	108.4	.11	.488	1390.5	.12	.479
9 - RESERV	88.0		.396	795.0		.274

AMMUNITION RATES POSTURE	CURRENT DAY	FREQUENCIES CUMULATIVE
ATTACK	.000	.000
DEFENSE INTENSE	.191	.299
DELAY	.000	.096
DEFENSE LIGHT	.809	.660

WARTIME REPLACEMENT FACTORS POSTURE	CURRENT DAY	WARGEN POSTURES CUMULATIVE
ATTACK	.000	.000
DEFENSE	.115	.213
DELAY	.000	.039
INACTIVE	.885	.753

Figure 3-4. Blue Bn Engagement Frequency Report

3-4. FEBA LOCATION REPORTS

a. Report Cycle. The report cycle of the FEBA Location Reports is controlled by input on the Print Option Card. A choice of map representations is available to the gamer by means of an input option. A fixed-scale map displaying the entire battlefield (as identified by inputs) may be selected. Or, for better resolution, a variable-scale map may be selected in which the scale is automatically adjusted to display only the rectangular area symmetric about the east-west average of the D-day FEBA and extending westward and eastward just far enough to contain the FEBA at the time of the report. The vertical scale of these maps is an input value.

b. FEBA Location and Distance. Tables presenting the FEBA location for each minisector, and tables showing the distance the FEBA has changed from its original location to the current location for each minisector, can be requested as often as every division cycle. The content of the FEBA Location Reports is described in detail as follows.

c. Variable Scale FEBA Map by Division Cycle (Figure 3-5)

Vertical scale	An input value that is measured in minisectors per line. The north-south resolution for representing the FEBA trace is represented by this value; e.g., in the sample, each line or print represents a distance of 10 minisectors.
Horizontal scale	The horizontal scale, expressed in kilometers per column, is automatically varied by the model as the distance between the current FEBA and the original FEBA changes; i.e., as one force proceeds deeper into the opposing force's territory, the horizontal scale becomes smaller (more kilometers per column) to prevent the battlefield from exceeding the sideways limits of the paper.
Average FEBA	Represents the average east-west location coordinate of the FEBA. It is computed by summing the coordinates (in km) for all the minisectors and dividing by the number of minisectors.
Maximum points (Blue and Red)	The easternmost (for Blue) and westernmost (for Red) locations along the FEBA. These represent the maximum for the penetrations of the two sides.
Change from starting average/ FEBA	Differences between the average FEBA location at time zero and the current average FEBA location.

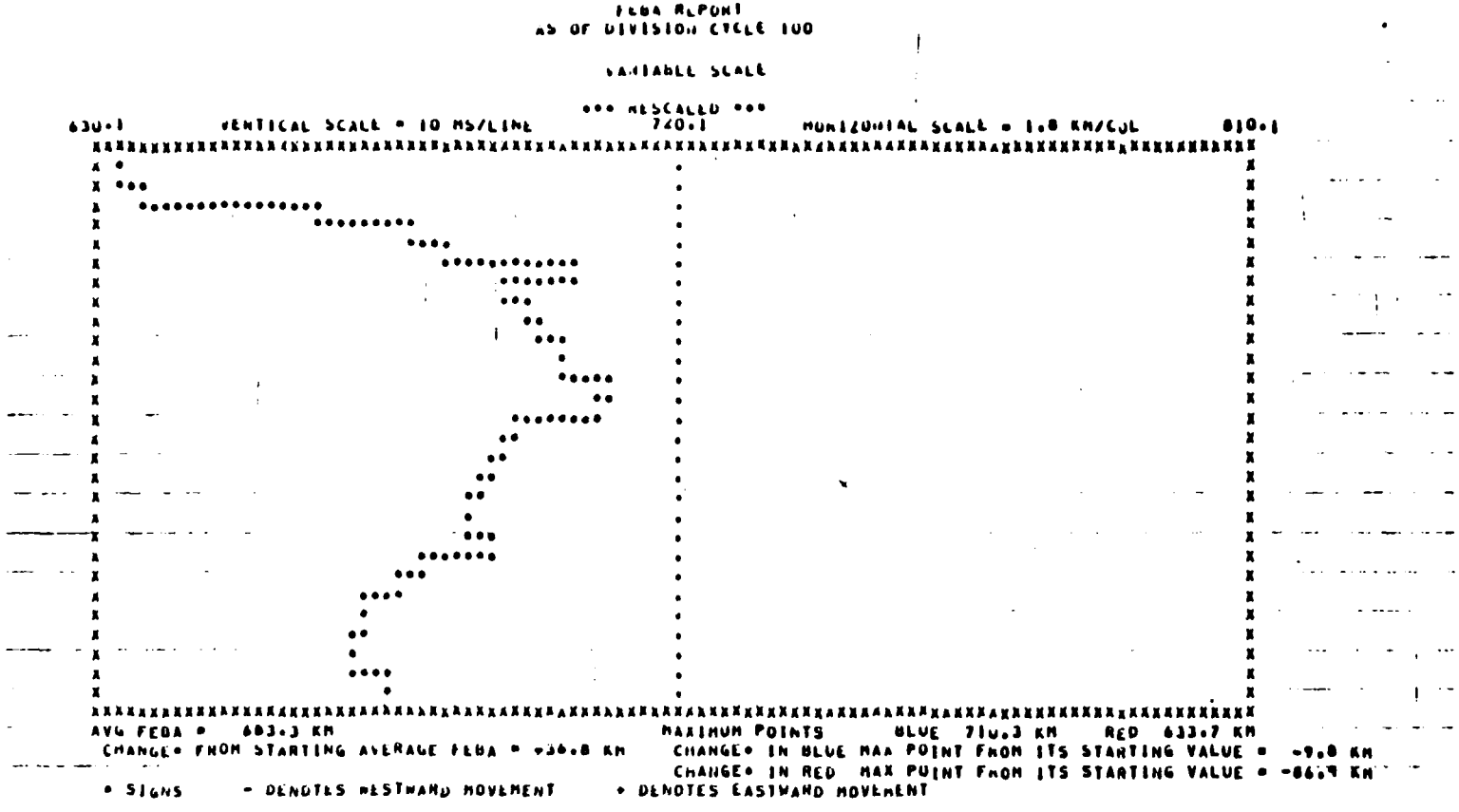


Figure 3-5. Variable Scale FEBA Map

d. Fixed Scale FEBA Map by Division Cycle. This map option provides a fixed-map scale so that, for example, the FEBA trace for day 30 can be overlaid directly with the FEBA trace for day 60 for visual comparison. The meaning of the wording below the map is the same as for the variable scale map.

e. FEBA Location Table by Division Cycle (Figure 3-6). This table indicates the FEBA position, in kilometers, for each minisector. Digits in the minisector number appear horizontally across the top of the table and 10s vertically down the left side; the actual minisector number is represented by the intersection of a "10s" row and a "digits" column. (The intersection of the "10" row and the "10" column is the value for minisector 20, etc.) The line above the table, "TIME-/-/-/-," indicates the elapsed battlefield time in terms of theater cycle/army cycle/corps cycle/division cycle.

f. FEBA Difference Table by Division Cycle (Figure 3-7). This table shows the (cumulative) change in each minisector's east-west coordinate since time zero. The change is shown in km; a negative sign shows a westward change; no sign (= positive) shows an eastward change.

FLOA LOCATION TABLE
TIME 13/25/50/100

	1	2	3	4	5	6	7	8	9	10
0	637.8	637.8	637.8	637.8	637.8	633.7	633.7	633.7	633.7	633.7
10	633.7	633.7	635.5	635.5	635.5	635.5	635.5	635.5	638.0	638.0
20	640.7	640.7	640.7	640.7	640.7	644.8	650.0	665.0	665.0	665.0
30	665.0	665.0	665.0	667.2	667.2	667.2	679.9	679.9	679.9	679.9
40	679.9	679.9	679.9	679.9	679.9	685.0	685.0	685.0	685.0	685.0
50	685.0	689.1	689.1	689.1	689.1	689.1	689.1	704.1	704.1	704.1
60	704.1	704.1	704.1	691.9	691.9	691.9	691.9	693.3	693.3	693.3
70	693.3	697.6	697.6	697.6	697.6	697.6	697.6	697.6	697.6	697.6
80	697.6	701.3	701.3	701.3	701.3	701.3	701.3	701.3	700.0	700.0
90	701.6	701.6	701.6	701.6	703.5	703.5	703.5	703.5	703.5	703.5
100	703.5	703.5	703.5	703.5	703.5	703.5	703.5	703.5	703.5	703.5
110	703.5	703.5	703.5	707.5	707.5	707.5	707.5	710.2	710.2	710.2
120	710.2	710.2	710.3	710.3	710.1	710.1	709.0	709.0	709.0	709.0
130	705.2	705.2	705.2	705.2	703.5	703.5	696.1	696.1	695.4	695.4
140	695.4	695.4	695.4	693.1	693.1	693.1	693.1	693.1	693.6	693.6
150	691.0	691.0	691.6	691.6	691.9	691.9	691.9	691.9	691.9	691.9
160	691.7	691.7	691.7	691.4	691.4	691.4	690.9	690.9	690.9	690.9
170	690.5	675.5	675.5	675.5	673.8	673.8	673.8	686.9	688.1	686.1
180	688.1	687.0	686.6	688.6	688.6	688.6	688.6	688.6	688.6	686.6
190	691.0	691.0	691.0	691.0	691.0	691.0	691.0	691.5	691.5	691.7
200	691.7	691.7	691.7	691.7	681.7	681.7	681.7	681.7	681.7	681.7
210	681.7	681.7	681.7	681.7	681.7	681.7	676.4	676.4	676.4	677.1
220	677.1	677.1	677.1	677.1	677.1	677.1	676.5	672.9	672.9	672.8
230	672.8	672.8	672.7	672.7	672.7	672.7	672.7	672.7	671.9	671.9
240	671.9	671.9	671.9	671.9	671.0	671.0	671.0	671.0	671.0	670.8
250	670.8	670.8	670.8	671.2	671.2	671.2	670.7	670.8	670.8	670.8
260	670.8	670.9	671.8	671.8	671.8	673.8	673.8	673.8	675.5	675.5
270	675.5	675.9	675.9							

Figure 3-6. FEBA Location Table

FEBA DIFFERENCE TABLE*
TIME 13/25/50/100

	1	2	3	4	5	6	7	8	9	10
0	-82.3	-82.3	-82.3	-82.3	-82.3	-86.4	-86.4	-86.4	-86.4	-86.4
10	-86.4	-86.4	-84.6	-84.6	-84.6	-84.6	-84.6	-84.6	-82.1	-82.1
20	-79.4	-79.4	-79.4	-79.4	-79.4	-75.3	-70.1	-55.1	-55.1	-55.1
30	-55.1	-55.1	-55.1	-52.9	-52.9	-52.9	-40.2	-40.2	-40.2	-40.2
40	-40.2	-40.2	-40.2	-40.2	-40.2	-35.1	-35.1	-35.1	-35.1	-35.1
50	-35.1	-31.0	-31.0	-31.0	-31.0	-31.0	-31.0	-16.0	-16.0	-16.0
60	-16.0	-16.0	-16.0	-28.2	-28.2	-28.2	-28.2	-26.8	-26.8	-26.8
70	-26.6	-22.5	-22.5	-22.5	-22.5	-22.5	-22.5	-22.5	-22.5	-22.5
80	-22.5	-18.8	-18.8	-18.8	-18.8	-18.8	-18.8	-18.8	-20.1	-20.1
90	-18.5	-18.5	-18.5	-18.5	-16.6	-16.6	-16.6	-16.6	-16.6	-16.6
100	-16.6	-16.6	-16.6	-16.6	-16.6	-16.6	-16.6	-16.6	-16.6	-16.6
110	-16.6	-16.6	-16.6	-12.6	-12.6	-12.6	-12.6	-9.9	-9.9	-9.9
120	-9.9	-9.9	-9.8	-9.8	-10.0	-10.0	-11.1	-11.1	-11.1	-11.1
130	-14.9	-14.9	-14.9	-14.9	-16.6	-16.6	-24.0	-24.0	-24.7	-24.7
140	-24.7	-24.7	-24.7	-27.0	-27.0	-27.0	-27.0	-27.0	-26.5	-26.5
150	-29.1	-29.1	-26.5	-28.5	-28.2	-28.2	-26.2	-28.2	-26.2	-28.2
160	-26.4	-26.4	-28.4	-26.7	-28.7	-26.7	-29.2	-29.2	-29.2	-29.2
170	-29.6	-44.6	-44.6	-44.6	-46.3	-46.3	-46.3	-33.2	-32.0	-32.0
180	-32.0	-33.1	-31.5	-31.5	-31.5	-31.5	-31.5	-31.5	-31.5	-31.5
190	-29.1	-29.1	-29.1	-29.1	-29.1	-29.1	-29.1	-26.6	-26.6	-28.4
200	-28.4	-26.4	-28.4	-28.4	-38.4	-38.4	-38.4	-38.4	-38.4	-38.4
210	-38.4	-38.4	-36.4	-38.4	-38.4	-38.4	-43.7	-43.7	-43.7	-43.0
220	-43.0	-43.0	-43.0	-43.0	-43.0	-43.0	-43.6	-47.2	-47.2	-47.3
230	-47.3	-47.3	-47.4	-47.4	-47.4	-47.4	-47.4	-47.4	-48.2	-48.2
240	-48.2	-48.2	-48.2	-48.2	-49.1	-49.1	-49.1	-49.1	-49.1	-49.3
250	-49.3	-49.3	-49.3	-48.9	-48.9	-48.9	-49.4	-49.3	-49.3	-49.3
260	-49.3	-49.2	-48.3	-48.3	-48.3	-46.3	-46.3	-46.3	-44.6	-44.6
270	-44.6	-44.2	-44.2							

* VALUE SHOWN AT EACH MINISECTOR IS THE DIFFERENCE IN KILOMETERS BETWEEN ITS CURRENT VALUE AND ITS STARTING VALUE

SIGN CONVENTION - INDICATES A WESTWARD CHANGE + INDICATES AN EASTWARD CHANGE

Figure 3-7. FEBA Difference Table

3-5. LOGISTICAL REPORTS. Three logistic report formats are used to present the consumption and replacement of resources by the combat units. The reports are item oriented in contrast to the unit orientation of the tactical reports.

a. The initial report format is the division cycle logistic report, as shown in Figure 3-8. There is a print frequency option which may be used to have this report printed every division cycle or following the last division cycle of each theater cycle. The latter option results in the total unit losses being summed over each theater cycle instead of giving the single division cycle losses. The cumulative losses are summed from the start of the combat simulation, independent of the division cycle print frequency. The entries in this report are further described as follows:

Theater resources — Listing of maneuver battalion (Red regiment) and cavalry squadron personnel, categories of supply types of major combat vehicles, and types of ground antitank/mortar weapons. NOTE: Red-side information in these reports does not include the resources of the Red divisions in the "Decimation Pool."

Combat unit status — Authorized: Resources authorized for the units in the force when they are at full strength. NOTE: The personnel entry includes both crew members for major vehicles (tanks, APCs, and helicopters) and noncrew personnel.

On hand: Number, or quantity, of each status file item at end of the division cycle after the unit has been resupplied.

Percent: The ratio of on hand to authorized.

For Blue: The amount of a resource on hand after resupply is calculated thus:

$$M(N) = M(N-1) + \text{Min}(P(N), Q(N)) - S(N)$$

Where:
M(N) is resource on hand at end of current cycle after that cycle's resupply.
M(N-1) is amount on hand at end of the previous cycle
P is resource quantities available
Q is resource quantities required before resupply
S is resources lost during the cycle

For Red: If Red uses the decimation pool method of resupply, the relationship above applies only for POL, AMMO, and other. Personnel and weapons systems are resupplied only to divisions in the decimation pool.

BLUE

COMBAT UNIT SUMMARY

ALL UNITS AT END OF DIVISION CYCLE 80

THEATER RESRCES	COMBAT UNIT STATUS AFTER RESUPPLY: AUTHORIZED	ON HAND	PERCENT	COMBAT UNIT SUPPORT BEFORE RESUPPLY: AVAILABLE	REQUIRED	PERCENT	TOTAL UNIT LOSSES	CUMULATIVE COMBAT UNIT LOSSES: COMBAT TEMP	COMBAT PERM	NONCOMBAT TEMP	NONCOMBAT PERM	TOTAL
PERSNL	198746.9	62625.3	31.5	960.9	136582.9	.7	14999.5	15378.0	138660.1	2942.1	1951.7	158831.9
1	198746.9	62625.3	31.5	960.9	136582.9	.7	14999.5	15378.0	138660.1	2942.1	1951.7	158831.9
POL	130425.1	130309.2	99.9	1320905.3	2309.6	999.9	17371.9	.0	152092.1	.0	3321.0	155413.1
1	130425.1	130309.2	99.9	1320905.3	2309.6	999.9	17371.9	.0	152092.1	.0	3321.0	155413.1
AMMO	50247.8	50227.0	100.0	218099.7	912.9	999.9	3098.8	.0	27099.9	.0	760.9	27855.8
1	50247.8	50227.0	100.0	218099.7	912.9	999.9	3098.8	.0	27099.9	.0	760.9	27855.8
TNKS 2	828.0	480.5	58.0	67.8	915.2	16.3	622.9	631.9	652.1	79.9	7.1	1371.2
TNKS 3	2396.0	30.9	1.3	21.9	2337.0	.9	231.1	2846.0	2713.9	361.8	23.7	5945.6
TNKS 4	270.0	2.9	.9	2.1	269.7	.8	29.6	282.9	320.9	42.0	2.8	648.1
TNKS 5	1777.0	71.9	4.0	91.0	1766.1	4.3	369.3	2109.2	2333.9	266.9	18.9	4717.8
TNKSUM	5241.0	585.6	11.2	132.8	4788.1	2.8	1248.0	5570.3	6019.9	748.5	52.0	12382.7
APCS 1	972.0	729.0	75.0	16.1	259.1	6.2	154.8	733.2	322.8	408.2	67.0	1531.2
APCS 2	6679.0	4917.0	76.0	119.6	1976.6	7.8	1097.0	4027.6	1703.7	1900.9	309.5	7941.9
APCS 3	2480.0	1796.8	72.5	48.7	731.8	6.7	401.7	1630.2	688.9	758.4	123.8	3201.3
APCSUM	9131.0	6842.9	74.9	179.4	2967.5	7.3	1653.9	6391.2	2715.4	3067.5	500.3	12674.9
HELO 1	816.0	173.3	21.2	8.0	650.7	1.2	93.5	217.3	576.1	485.6	51.9	1330.9
HELO 4	11.0	6.8	61.5	.3	4.7	5.5	4.1	2.7	7.2	3.6	.4	13.9
HELO 5	144.0	35.3	24.5	1.3	109.9	1.1	17.6	40.7	107.9	112.8	11.6	273.1
HELSUM	971.0	216.9	22.2	9.5	765.4	1.2	115.3	260.7	691.1	602.0	63.6	1617.9

Figure 3-8. Example of Division Cycle Logistic Report

Combat unit support before resupply

Available: Number of personnel, tons of supplies, or quantity of weapons in the appropriate theater distribution pool.

Required: Resources needed by combat units before the resupply for that division cycle occurs (i.e., before the status file entries are incremented). Personnel are in units of persons, supplies in tons, and weapon systems in weapons.

Personnel Replacement - Both Blue and Red: The personnel actually available for assignment to combat units can be restricted by an assimilation delay. (This delay is specified in the data deck.)

When a delay is specified, a "cleared for assimilation" pool (not shown) is created, and the number of men added during resupply is the minimum of required men (col. Q) or men in the "cleared for assimilation" pool.

Amount Required - Both Blue and Red: The amount of a resource required in a given cycle before that cycle's resupply is calculated thus:

$Q(N) = L(N-1) - M(N-1) + S(N)$

Where:
Q(N) is the amount required
(L(N-1)-M(N-1)) is the difference between the previous cycle's authorized and on-hand amounts.
S(N) is the amount of resource lost during the current cycle.

This relationship is valid for Red because the authorized and on-hand values are calculated by aggregating status files, not including the status files of units in the decimation pool.

Total unit losses

The total amount of a resource "lost," both temporarily and permanently, due to both combat and noncombat causes during a given cycle. The term "losses" as used in these reports include only those that decrement the status of the appropriate units.

Cumulative combat unit losses

Combat:

Temp - For personnel, the value given represents the total number of wounded, not requiring evacuations, who have entered a theater hospital for treatment since D-day. The "TEMP" column shows zero values for POL, AMMO, and other because there is not "temporary"

damage of them. For weapons systems other than AT/M, the values shown are "total damaged, retrieved, and sent into theater shops since D-day." For AT/M, all equipment damage is permanent.

Perm - The personnel value represents the number of casualties due to DNBI who have been evacuated from the theater or who have died sine D-day. For supplies, the values represent the total tonnage consumed by units in reserve during the division cycle since D-day. The equipment value represents the total quantity of equipment, with the exception of AT/M weapons, which is abandoned after experiencing mechanical failure. There are no noncombat losses of AT/M weapons.

Total: The total amount of a resource "lost," both temporarily and permanently, due to both combat and noncombat causes since D-day. For supplies, the total consumption of on-line and reserve units.

b. The theater cycle logistic report is a summary of the logistic status and resource flow during the theater cycle. As illustrated in Figure 3-9, it presents an accounting of resources on hand at the end of the cycle, losses sustained, flow of resources through the theater, and receipt of resources from out of theater. This presentation does not include the resources of the Red divisions in the decimation pool. The entries in this report are described as follows:

Theater resources — Listing of types of resource in all cavalry squadrons and maneuver units.

Resource on hand — **Combat Units:**

Personnel - Total tonnage of supplies in force's cavalry squadrons and maneuver units at end of the theater cycle.

Supplies - Total tonnage of supplies in force's cavalry squadrons and maneuver units.

Equipment - Total quantity of equipment, by type, in force's cavalry squadrons and maneuver units.

Theater Stocks:

Personnel - Total number in theater replacement pool.

Supplies - Total tonnage in theater supply system.

BLUE FORCE THEATERWIDE LOGISTIC SUMMARY AT END OF THEATER CYCLE 2

THEATER RESRCES	RESOURCES ON HAND: COMBAT UNITS	THEATER STOCKS	IN REPAIR	TOTAL	LOSSES TO COMBAT UNITS: COMBAT TEMP	COMBAT PERM	NONCOMBAT TEMP	NONCOMBAT PERM	TOTAL	GAINS TO THEATER STOCKS: FROM RESUPPLY	FROM REPAIR	GAINS TO UNIT
PERSNL	356705.6	1999960710.0	25671.1	200393112.0	10309.1	73249.3	1309.4	496.1	85593.9	71300	.0	81753.8
1	81920.3	263.7	9951.5	86463.5	962.1	5815.2	337.6	166.6	7281.5	3300	.0	3300.0
2	149578.3	99963898.0	10897.5	100129375.0	4019.7	33362.2	535.6	264.3	38976.8	24000	.0	38998.7
3	125199.3	99996540.0	10320.2	100132079.0	9612.3	34072.1	436.1	215.3	39335.7	42000	.0	39367.2
POL	338047.1	15397045.9	.0	15605892.9	.0	58770.6	.0	2804.5	61675.1	907510	.0	61990.2
1	65553.3	1038233.6	.0	1103786.9	.0	3667.3	.0	687.9	4354.8	51000	.0	4457.1
2	127463.6	7282496.1	.0	7409959.7	.0	38089.0	.0	1334.6	39423.6	11110	.0	39609.2
3	145030.2	7026316.2	.0	7172146.4	.0	17014.2	.0	782.5	17796.8	925900	.0	17873.9
AMMO	40568.0	1000573113.0	.0	1000117080.0	.0	5564.3	.0	133.6	5698.0	36601	.0	5878.9
1	25283.1	1000573113.0	.0	1000082596.0	.0	812.0	.0	58.2	870.3	32699	.0	896.9
2	15249.2	.0	.0	15249.2	.0	2392.9	.0	30.6	2423.5	1505	.0	1505.0
3	20035.7	.0	.0	20035.7	.0	2359.4	.0	44.8	2404.2	2477	.0	2477.0
TNKS 1	1609.6	.0	707.7	2392.3	98.4	69.5	123.6	6.9	238.4	127	100.7	227.7
										(1)	96.5	
										(2)	4.2	
TNKS 2	266.4	.0	129.4	395.8	3.3	1.2	20.1	1.1	25.7	8	17.0	26.0
										(1)	17.0	
TNKS 3	3387.5	6969.0	764.1	9688.4	178.1	244.2	235.8	14.9	672.2	5	36.8	1071.6
										(1)	19.7	
										(2)	17.1	
TNKS 5	415.0	.0	127.0	542.0	36.6	47.0	30.8	1.9	117.1	91	60.5	101.5
										(2)	59.7	
										(3)	.8	
TNKS 6	429.9	.0	160.9	593.9	26.6	35.2	33.3	2.8	56.2	52	6.5	58.5
										(3)	6.5	

Figure 3-9. Example of Theater Cycle Logistic Report

Equipment - Total number of items in theater major item pool available for issue to maneuver units/ cavalry squadrons.

In Repair:

Personnel - Number in theater hospitals for in-theater medical care.

Equipment - Number of items in theater maintenance system for repair and return to theater combat units.

Total: Total number/quantity on hand in theater. Sum of the items in combat units plus those in theater stocks plus those in repair. This total may also be computed as:

$X(N) = X(N-1) - E(N) - G(N) + H(N)$
Where:
$X(N)$ is the total on hand in theater at end of current cycle.
$X(N-1)$ is the total on hand for the previous theater cycle.
$E(N)$ is permanent loss due to combat.
$G(N)$ is permanent loss due to noncombat factors.
$H(N)$ is gains to theater stocks from external sources.

Losses to combat units

Combat:

Temp:

Personnel - Total number of wounded, not requiring evacuation, who enter a theater hospital for treatment during the given theater cycle.

Supplies - No temporary losses.

Equipment (other than AT/M weapons) - The total number damaged, retrieved, and transferred to a theater maintenance facility during the given theater cycle. (Not applicable to AT/M weapons).

Perm:

Personnel - The sum of KIA and CMIA, plus those wounded who were evacuated from the theater during the given theater cycle.

Supplies - Total tonnage consumed during the theater cycle by units while they were on line.

Equipment - Total number destroyed and damaged, but not retrieved, during the cycle.

Noncombat:

Temp:

Personnel - Total number of casualties due to DNBI who entered a theater hospital for medical treatment during the cycle.

Supplies - No temporary losses.

Equipment - (Other than AT/M weapons). Total number of breakdowns due to mechanical failure during the cycle. (Not applicable to AT/M weapons.)

Perm:

Personnel - Total number evacuated from the theater or dead during the given theater cycle.

Supplies - Total tonnage consumed during the cycle by units while they were in reserve.

Equipment (Other than AT/M weapons) - Total quantity for a given cycle, which are abandoned after experiencing mechanical failure.

AT/M weapons - No noncombat losses.

Total: The total amount of resources "lost," both temporarily and permanently, due to both combat and noncombat causes in a given theater cycle.

Gains to theater stocks

From Supply: Total number/quantity of resources received by the appropriate theater distribution pool, during the given cycle, from sources outside the theater, e.g., CONUS.

From Repairs:

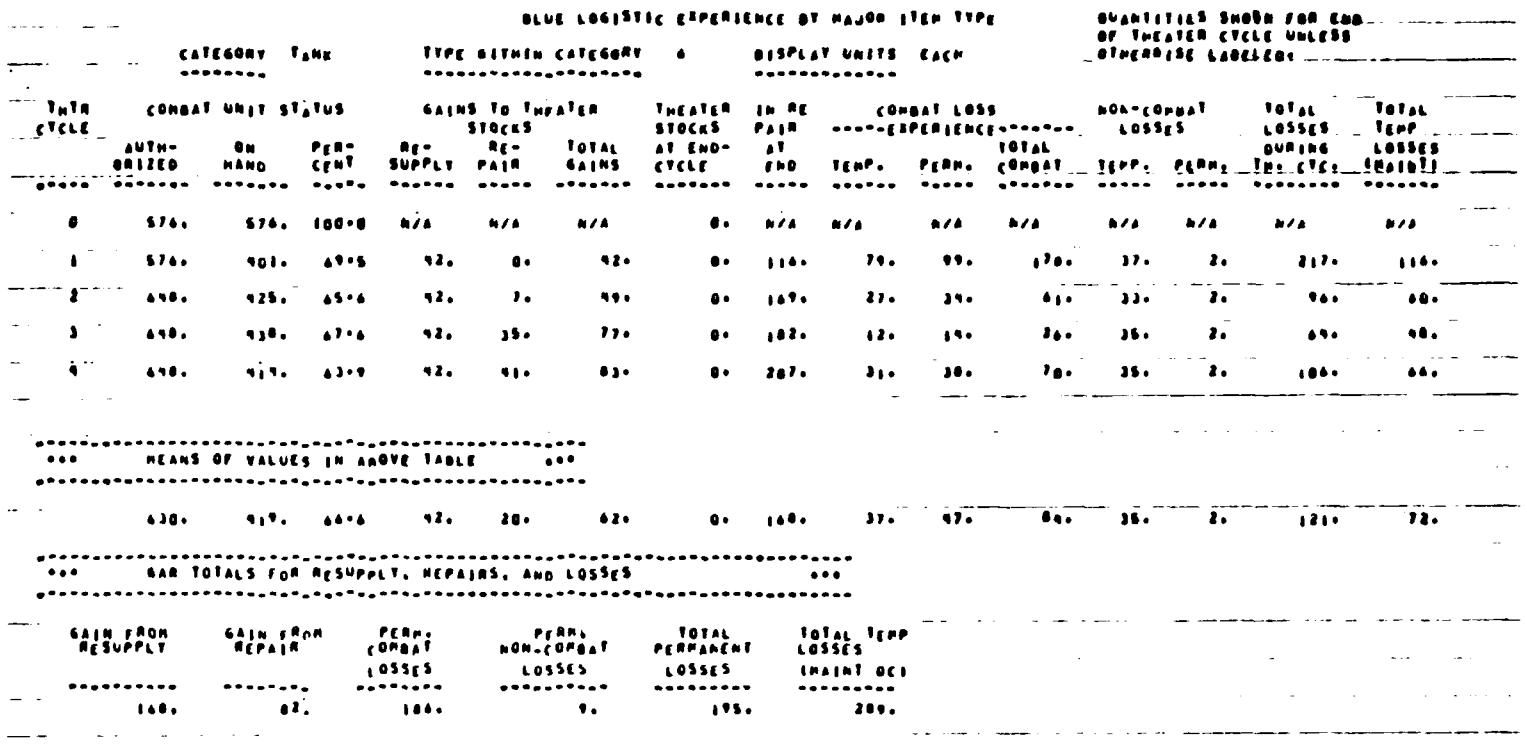
Personnel - Total number of personnel transferred to the theater replacement pool for theater hospitals during the given theater cycle.

Supplies - N/A

Equipment - Total quantity forwarded to the theater major item distribution pool from theater maintenance facilities (AT/M weapons are not repaired).

Gains to unit	Total number/tonnage received by all Blue cavalry squadrons and maneuver units in the theater force during the given theater cycle. For Red, when the model is operated with a "Decimation Pool," the totals reflect the number of personnel and quantities of equipment received by Red divisions in the decimation pool. However, the totals for supplies represent tonnages distributed to all Red divisions in the theater. This difference is because the model sends personnel and equipment only to the "decimation pool" when using that method of unit rebuild; it continues, however, to send supplies to all Red divisions in theater.

c. The report of logistic experience by major item type (Figure 3-10) is produced only once, at the end of the simulation. It includes a separate presentation for personnel, for each category of supply, and for each item of equipment for each side.



BLUE LOGISTIC EXPERIENCE BY MAJOR ITEM TYPE

QUANTITIES SHOWN FOR END OF THEATER CYCLE UNLESS OTHERWISE LABELLED:

CATEGORY TANK — TYPE WITHIN CATEGORY 4 — DISPLAY UNITS EACH

THTR CYCLE	COMBAT UNIT STATUS: AUTHORIZED	ON HAND	PERCENT	GAINS TO THEATER STOCKS: RESUPPLY	REPAIR	TOTAL GAINS	THEATER STOCKS AT END-CYCLE	IN REPAIR AT END	COMBAT LOSS EXPERIENCE: TEMP.	PERM.	TOTAL COMBAT	NON-COMBAT LOSSES: TEMP.	PERM.	TOTAL LOSSES DURING THR CYC	TOTAL TEMP LOSSES (MAINT)
0	576.	576.	100.0	N/A	N/A	N/A	0.	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
1	576.	401.	69.5	92.	0.	92.	0.	116.	79.	99.	178.	37.	2.	217.	116.
2	448.	425.	65.6	92.	7.	99.	0.	169.	27.	34.	61.	33.	2.	96.	60.
3	448.	438.	67.6	92.	35.	77.	0.	102.	12.	14.	26.	35.	2.	64.	48.
4	448.	419.	63.9	92.	41.	83.	0.	207.	31.	38.	70.	35.	2.	106.	66.
*** MEANS OF VALUES IN ABOVE TABLE ***															
	430.	419.	64.6	92.	28.	62.	0.	148.	37.	47.	84.	35.	2.	121.	72.

*** GAR TOTALS FOR RESUPPLY, REPAIRS, AND LOSSES ***

GAIN FROM RESUPPLY	GAIN FROM REPAIR	PERM: COMBAT LOSSES	PERM: NON-COMBAT LOSSES	TOTAL PERMANENT LOSSES	TOTAL TEMP LOSSES (MAINT OC)
168.	82.	186.	9.	195.	289.

Figure 3-10. Example of Logistic Report by Major Item Type

3-6. COMMAND AND CONTROL REPORTS. The command and control reports provide the data used in making Army and corps decisions as to unit mission assignments and force relocations or reorganizations. A decision report is produced for each Army simulation cycle and each corps simulation cycle. The entries in these reports are described as follows

a. Army Decision Summary (Figure 3-11)

Army name	Designation of each theater organization above corps echelon at which certain decisions are made every Army cycle. For Red, the designations are for fronts, which will contain two to five Red armies. Decisions made every Army cycle include: allocation of fire support (both GS artillery battalions and close air support (CAS) sorties), commitment or reconstitution of a reserve, assignment of arriving reinforcement divisions, and (for Red) assignment of reinforcement divisions released from the "decimation pool."
Frontage	Defines the Army/Front sector of responsibility in terms of minisectors.
Mission	The mission (attack, defend, delay) selected by the Army (Red Front) for the next Army cycle. Mission selection influences other Army decisions, i.e., distribution of corps artillery assets, CAS sortie allocation, Army reserve commitment, and assignment of reinforcing divisions.
Friendly force values (FV)	Total FV of friendly Army (Red Front) units considered in the Army estimate of the situation. The FV of all units in subordinate corps that are capable (i.e., the unit state exceeds the mission threshold) of undertaking the mission indicated in the "mission" column are aggregated to arrive at the total.
Estim enemy FV	Total force value estimated for enemy units considered in the Army estimate of the situation. Units on the enemy side that are in on-line divisions facing the Army that are capable of undertaking the complementary mission* (e.g., if friendly mission = defend, then complementary enemy mission is attack) are estimated, and their FVs are added to the FVs of enemy artillery battalions estimated to be facing the Army. *"Capable" means that the unit's state exceeds the threshold state required for that (complementary) mission.

ARMY DECISION SUMMARY
ARMY CYCLE 7

ARMY NAME	FRONTAGE	MISSION	FRIENDLY FP	ESTIM. ENEMY FP	FORCE RATIO	REMARKS
			SIDE BLUE			
ARMYN001	1 - 300	DEFEND	692.09	1188.76	.590	
ARMYS002	301 - 660	DEFEND	1032.33	1392.63	.791	
			SIDE RED			
NORFRONT	1 - 197	ATTACK	959.29	939.03	1.096	
CENFRONT*	198 - 471	ATTACK	1059.33	910.16	1.169	
SOUFRONT	472 - 660	ATTACK	958.99	815.69	.796	

Figure 3-11. Example of Army Decision Summary

Force ratio	The force ratio is computed by dividing "friendly FV" by "estim enemy FV." The value for the force ratio is compared to input thresholds to determine which mission the Army will undertake for the next Army cycle.
Remarks	Any decision concerning a reserve corps will appear here.

b. Corps Decision Summary

Corps name	Designation of each Blue corps or Red Army at which certain decisions are made every corps cycle. Decisions made every corps cycle include: allocation of GS artillery, corps cavalry, and CAS sorties to divisions; reserve commitment or reconstitution; and (for Red), the transfer of decimated divisions to the decimation pool.
Frontage	Defines the corps (Red Army) sector of responsibility in terms of minisectors.
Mission	The mission (attack, defend, delay, reserve) selected by the corps (Red Army) for the next corps cycle. Mission selection influences the other corps decisions described above.
Friendly FV	Total force value of friendly corps (Red Army) units considered in the corps estimate of the situation. All units that are in subordinate divisions capable (i.e., the unit state exceeds the mission threshold) of undertaking the mission indicated in the "mission" column are identified, and their force values are added to the FVs of all corps cavalry units and organic division artillery battalions.
Estim enemy FV	Total force value estimated for enemy units considered in the corps estimate of the situation. Units on the enemy side that are in-line divisions facing the corps and capable (i.e., the unit state exceeds the mission threshold) of undertaking the complementary mission are considered, and their force values are added to the FVs of all artillery battalions estimated to be facing the corps.
Force ratio	The force ratio is computed by dividing "friendly FV" by "estim enemy FV." The value for the force ratio is compared to input thresholds to determine which mission the corps will undertake for the next corps cycle.

Remarks — Any decision concerning a reserve division will appear here.

3-7. LOSSES/CAUSE REPORT (Figure 3-12)

a. **Physical Organization.** The losses/cause report is arranged thus:

- A page is printed for each day of the war showing, for both sides, the day's losses in each category of equipment. The day's total losses for each category are subdivided into the components caused by each opponent category. Similar information is printed for each Blue partition in the simulation.
- Every 10th day, two 10-day-slice displays are printed. They are the average daily occurrences for that 10-day-slice, and the total occurrences during that 10-day-slice.
- Every 30th day, two 30-day-slice displays are printed. They are the daily averages for, and total occurrences during, that 30-day period.
- At the end of the war, two end-of-war displays are printed to show the daily averages and the totals for the entire war.

b. **Page Layout.** All the displays are laid out thus:

- The top half of each page shows the Blue side's categories of equipment lost (named on the left side) versus the Red categories of equipment causing the Blue losses. The "TOTALS" column at the far right is the total Blue loss of the categories named on the left from all Red causes.
- The bottom half of each page shows the Red side's losses of equipment categories versus the Blue categories causing them; it is laid out in the analogous manner to the top half of the page.

DAILY COMBAT DAMAGED (PERM + TEMP) VS CAUSE TABLE
ARRIVING CAV. EQUIPMENT INTERCHANGEABILITY **UNCLASSIFIED**

LOSSES DURING DAY 1

LOSSES OF SIDE BLUE

BLUE CATEGORY LOST	TANKS	APCS	CATEGORY CAUSING LOSS RED AT/H	MELOS	ARTY	CAS	TOTAL
TANKS (PERM)	472.32	69.63	24.16	88.84	.00	46.01	696.96
(TEMP)	399.23	109.18	38.18	142.62	.00	27.92	707.06
APC (PERM)	110.32	92.63	7.69	58.20	.00	12.10	280.95
(TEMP)	275.86	533.78	43.01	334.80	.00	26.93	1214.37
AT/H	1.30	.97	58.82	.00	2389.30	9.21	2555.18
PERSONNEL (INCLUDES AID STATION & R.T.D.)							
CREW	1034.99	898.76	161.85	773.13	.00	162.90	3021.64
HELO CREW							87.76
NONCBT	19.32	19.05	777.57	.00	38035.19	67.05	39213.18
ARTILLERY	.00	.00	.00	.00	.00	.00	.00
HELOS							38.76

LOSSES OF SIDE RED

RED CATEGORY LOST	TANKS	APCS	CATEGORY CAUSING LOSS BLUE AT/H	MELOS	ARTY	CAS	TOTAL
TANKS (PERM)	1026.60	62.39	301.58	299.95	25.21	226.83	1887.56
(TEMP)	686.07	86.18	416.43	150.19	60.82	104.74	1503.64
APC (PERM)	238.61	95.37	127.66	148.02	52.39	83.43	695.48
(TEMP)	421.92	106.26	317.81	286.90	129.70	39.26	1296.33
AT/H	.00	.00	21.77	.00	118.91	1.76	141.93
PERSONNEL (INCLUDES AID STATION & R.T.D.)							
CREW	3948.47	303.98	1969.24	1912.79	465.86	752.68	9053.04
HELO CREW							115.79
NONCBT	.00	.00	4289.79	.00	23881.96	344.06	28515.79
ARTILLERY	.00	.00	.00	.00	.00	.00	.00
HELOS							

Figure 3-12. Example of Losses/Cause Report

3-8. BLUE PERSONNEL DETAIL REPORT. The Blue personnel detail report (Figure 3-13) presents a detailed accounting of Blue personnel casualties, by national partition. The losses are broken out into the categories of killed in action, wounded in action, captured/missing in action, dead, and sick. The casualties are also divided among those treated at aid stations and returned to duty, those treated at hospitals in theater, those evacuated from theater for treatment, and dead. For every day (two division cycles) of the simulation, this breakout of casualties is reported on one line, followed by a line presenting the cumulative casualties since D-day. After the last daily report, the daily mean values are reported.

CEM BLUE PERSONNEL DETAIL REPORT - OCCURRENCES DURING EACH DAY (FIRST LINE) AND CUMULATIVE TOTALS FOR THE BAR AT THE END OF DAY
RUN 1.0.1 TAA-86/0C2A 29SEP79 UNCLASSIFIED. PAGE 1

DAY	COMBAT LOSSES KIA	COMBAT LOSSES DIA (NOT INCLDG AID STA)	COMBAT LOSSES CMIA	COMBAT LOSSES TOTAL	NON-COMBAT LOSSES DEAD	NON-COMBAT LOSSES SICK	NON-COMBAT LOSSES TOTAL	TOTALS DEAD	TOTALS ENTERED IN-THTR HOSPITAL	TOTALS EVAC. FROM THEATER	TOTAL HOSPITALIZD	TO AID STATION ONLY
1 TOT	4753.	9429.	1512.	15694.	16.	509.	525.	4769.	2926.	7512.	9938.	3326.
	4753.	9429.	1512.	15694.	16.	509.	525.	4769.	2926.	7512.	9938.	3326.
1 (P1)	621.	1255.	100.	1976.	4.	190.	194.	625.	373.	1022.	1395.	518.
	621.	1255.	100.	1976.	4.	190.	194.	625.	373.	1022.	1395.	518.
1 (P2)	4132.	8174.	1412.	13719.	11.	369.	380.	4144.	2553.	6490.	8543.	2810.
	4132.	8174.	1412.	13719.	11.	369.	380.	4144.	2553.	6490.	8543.	2810.
2 TOT	5136.	10518.	1682.	17336.	16.	817.	833.	5152.	2671.	8344.	11038.	3659.
	9889.	19947.	3194.	33030.	31.	1024.	1058.	9920.	5094.	15877.	20973.	6984.
2 (P1)	946.	1869.	164.	2973.	4.	193.	197.	950.	509.	1498.	2007.	700.
	1566.	3719.	264.	4949.	9.	283.	292.	1575.	881.	2620.	3402.	1216.
2 (P2)	4190.	8659.	1518.	14362.	11.	374.	386.	4201.	2162.	6866.	9029.	2959.
	8322.	16828.	2930.	28081.	23.	793.	766.	8345.	4216.	13356.	17671.	5770.
3 TOT	9504.	9707.	1394.	15807.	17.	547.	564.	9523.	2652.	7893.	10456.	3567.
	19395.	29654.	4589.	48838.	48.	1674.	1622.	19443.	7654.	23774.	31428.	10991.
3 (P1)	1641.	2203.	203.	3446.	5.	166.	171.	1046.	579.	1770.	2349.	829.
	2467.	5322.	467.	8396.	14.	449.	463.	2621.	1481.	4290.	5771.	2039.
3 (P2)	3465.	7704.	1191.	12361.	12.	381.	393.	3477.	1958.	6127.	8085.	2692.
	11788.	24532.	4122.	40442.	34.	1124.	1159.	11822.	6173.	19784.	25657.	8452.
4 TOT	3832.	8795.	1358.	13985.	17.	546.	562.	3849.	2311.	7129.	9340.	3172.
	18227.	38649.	6947.	62823.	65.	2119.	2184.	18292.	9946.	30805.	40768.	13664.
4 (P1)	712.	1569.	177.	2959.	5.	164.	169.	717.	459.	1276.	1733.	633.
	3319.	6891.	644.	10855.	19.	614.	632.	3338.	1939.	5565.	7505.	2672.

Figure 3-13. Example of Blue Personnel Report

3-9. END OF COMBAT REPORTS. Three tactical activity summary reports are produced after the completion of the combat simulation: the Theater Summary, the Air Battle Summary, and the Sensitivity Analysis Indicators Report. These are described as follows.

a. Theater Summary (Figure 3-14)

Theater cycle (end of)	Theater period for which the line of data is applicable.
Kilometer change in mean FEBA	Distance (in kilometers) means theater FEBA moved. Distance represents the value of the ratio of the sum of the FEBA changes in all of the minisectors for given theater cycle to the total number of minisectors in the theater. A negative number indicates a Red advance (i.e., a westward movement of the mean FEBA).
Cum disp mean FEBA	Change in the coordinate value of the mean FEBA since the beginning of the war (as of the end of the current theater cycle).
Avg state all	Average state of all on-line and reserve maneuver battalions in the force. (Cavalry squadrons, artillery battalions, and support units are not included, nor are battalions in Red decimated divisions.)
Divisions in theater	Total number of divisions employed in theater.
Divisions decimated (Red)	Number of Red divisions in "Decimation Pool" for replacement of personnel and major weapons.
GS arty in theater	Number of nondivisional artillery battalions in the force.
CAS squadrons in theater	Number of squadrons of tactical aircraft that are assigned to CAS role in theater.
Arty AMMO expended (tons) period cum	Total tons of artillery rounds expended by artillery battalions in DS and GS roles during the theater cycle (PERIOD) and for the war through the end of the current theater cycle (CUM).

THEATER SUMMARY

THEATER CYCLE (END OF)	KILOMETER CHANGE IN MEAN FEBA*	CUM DISP MEAN FEBA (KM)	SIDE	AVG STATE ALL	DIVISIONS IN THEATER	DIVISIONS DECIMATED (RED)	AIRCRAFT IN THEATER	GS ARTY IN THEATER	CAS SQDRNS IN THEATER	ARTY AMMO EXPENDED (TONS) PER 100	ARTY AMMO EXPENDED (TONS) CUM
1	-5.3	-5.3	BLUE	98	8		848	17	7	37726	37726
			RED	88	24	0	1023	35	18	125341	125341
2	-5.3	-10.6	BLUE	92	8		806	17	5	38443	76169
			RED	77	24	0	908	35	21	128090	253431
3	-4.5	-15.1	BLUE	86	8		733	17	10	40059	116228
			RED	69	26	0	831	35	22	140412	393843
4	-4.8	-20.0	BLUE	84	11		778	20	12	41678	157905
			RED	64	27	7	767	35	21	129256	523099
5	2.1	-17.9	BLUE	81	11		706	20	11	33391	191296
			RED	65	29	16	713	35	20	72437	595536
6	3.5	-14.5	BLUE	80	11		649	20	10	31137	222433
			RED	58	29	17	657	35	19	61051	656586
7	4.9	-9.7	BLUE	78	11		614	20	10	30997	253438
			RED	52	29	17	610	35	10	58709	715295
8	.5	-9.2	BLUE	75	11		567	20	9	36624	290054
			RED	81	29	15	570	35	17	76312	791606
9	-2.0	-11.2	BLUE	70	13		524	22	8	45368	335414
			RED	77	31	11	526	35	15	103023	894429
10	-2.0	-13.3	BLUE	65	13		486	22	7	47170	302594
			RED	71	32	11	487	35	14	112087	1036716
11	-2.1	-15.5	BLUE	61	13		452	22	7	47788	430364
			RED	72	32	12	453	35	13	114662	1121378
12	-2.4	-17.9	BLUE	58	13		554	22	9	49917	480281
			RED	74	32	13	414	35	13	120715	1242093
13	-.3	-18.3	BLUE	57	13		523	26	8	46376	526658
			RED	69	32	15	379	35	12	99385	1341398
14	-.3	-18.6	BLUE	56	13		495	26	8	45464	572862
			RED	64	32	16	347	35	11	102868	1444250

Figure 3-14. Example of Theater Summary

b. Air Battle Summary (Figure 3-15)

Report at end of theater cycle	Theater cycle number. Data applies to conditions existing at end of each cycle listed.
TAC fighters on primary/sanctuary	Sum of tactical aircraft assigned to AR/I, CA, and CAS roles that are stationed at primary or sanctuary bases.
Air defense fighters	Quantity of air defense fighter aircraft assigned in theater.
PCT aircraft assigned by mission AR/I CA CAS	Percentage of tactical (TAC) aircraft, i.e., the total of those stationed at both primary and sanctuary bases, assigned to the indicated roles.
AC destroyed at primary period game	Quantity of aircraft stationed at a primary base which are destroyed on the ground (NOTE: aircraft stationed at a sanctuary base, by definition, are not subject to damage or destruction on the ground due to enemy attack.) Data given for each theater cycle (period) and cumulatively for the game thus far.
Total AC destroyed period game	Total number of tactical aircraft destroyed in theater by enemy air and enemy ground air defense actions for each theater cycle (period) and cumulative (game).
Total TAC fighters (primary/sanctuary)	Sum of two "TAC FIGHTERS ON" columns.
Aircraft in theater	Number of tactical aircraft in armed reconnaissance/ interdiction (AR/I), air defense interceptor (ADI), counterair (CA), and CAS roles.

c. Sensitivity Analysis Indicators Report (Figure 3-16). In addition to some of the information presented in the Theater Summary, the Sensitivity Analysis Indicators Report gives, for the end of each theater cycle, the ratio of Blue average state to Red average state, the cumulative permanent losses of Blue tanks and of Red tanks, the ratio of Blue permanent tank losses divided by Red permanent tank losses, the number of Blue personnel dead during the theater cycle, the cumulative Blue dead since D-day, and the number of Red divisions in the decimation pool at the end of the theater cycle.

AIR BATTLE SUMMARY

REPORT AT END OF THEATER CYCLE	SIDE	TAC FIGHTERS ON PRIMARY	TAC FIGHTERS ON SANCTUARY	AIR DEFENSE FIGHTERS	PCT AIRCRAFT ASNGD BY MISSION AP/I	PCT AIRCRAFT ASNGD BY MISSION CA	PCT AIRCRAFT ASNGD BY MISSION CAS	AC DESTROYED AT PRIMARY PERIOD	AC DESTROYED AT PRIMARY GAME	TOTAL AC DESTROYED PERIOD	TOTAL AC DESTROYED GAME	TOTAL TAC FIGHTERS (PRIM+SANC)
1	BLUE	589.	0.	249.	.25	.50	.25	81.	81.	138.	138.	589.
	RED	503.	0.	520.	.18	.65	.17	89.	89.	175.	175.	503.
2	BLUE	565.	0.	241.	.25	.56	.19	98.	129.	102.	240.	565.
	RED	998.	0.	951.	.13	.91	.96	83.	167.	197.	322.	998.
3	BLUE	511.	0.	222.	.20	.36	.99	36.	166.	73.	313.	511.
	RED	922.	0.	909.	.13	.91	.96	91.	208.	93.	415.	922.
4	BLUE	565.	0.	205.	.20	.36	.99	35.	201.	71.	389.	565.
	RED	399.	0.	368.	.13	.91	.96	91.	250.	88.	503.	399.
5	BLUE	516.	0.	190.	.20	.36	.99	32.	233.	69.	448.	516.
	RED	378.	0.	333.	.13	.91	.96	35.	285.	76.	579.	378.
6	BLUE	473.	0.	176.	.20	.36	.99	29.	262.	57.	505.	473.
	RED	355.	0.	302.	.13	.91	.96	30.	315.	66.	644.	355.
7	BLUE	452.	0.	163.	.20	.36	.99	27.	289.	53.	558.	452.
	RED	336.	0.	279.	.13	.91	.96	27.	342.	58.	703.	336.
8	BLUE	416.	0.	151.	.20	.36	.99	26.	319.	48.	605.	416.
	RED	321.	0.	260.	.13	.91	.96	23.	365.	51.	784.	321.

Figure 3-15. Example of Air Battle Summary

SENSITIVITY ANALYSIS INDICATORS REPORT

INTR CYCLE	PERIODIC DISPL OF MEAN FEBA IN KM *	CUMULATIVE DISPL OF MEAN FEBA IN KM *	AVERAGE UNIT STATE OF BLUE	AVERAGE UNIT STATE OF RED	STATE RATIO B/R	CUMULATIVE PERMANENT TANK LOSS, BLUE-TANKS	CUMULATIVE PERMANENT TANK LOSS, RED-TANKS	TANK LOSS RATIO B/R	PERIODIC PERMANENT PERSNL CAS. BLUE-MEN	CUMULATIVE PERMANENT PERSNL CAS. BLUE-MEN	RED DIVISIONS IN DECIMATION POOL
0	0.0	0.0	100	100	1.00	0.	0.	N/A	0.	0.	0
1	-7.1	-7.1	97	97	2.04	2149.	5793.	.37	107896.	107896.	5
2	-2.0	-9.2	97	94	2.28	2851.	7764.	.37	73895.	181791.	36
3	-.8	-10.0	98	97	2.09	3231.	8979.	.36	48908.	230622.	50
4	-1.3	-11.3	97	96	2.11	3987.	11184.	.35	55649.	286248.	58

MEANS OF VALUES FROM ABOVE TABLE ARE SHOWN BELOW

PERIODIC DISPL OF MEAN FEBA IN KM *	AVERAGE UNIT STATE OF BLUE	AVERAGE UNIT STATE OF RED	STATE RATIO B/R	BLUE TANK LOSS PER THEATER CYCLE	RED TANK LOSS PER THEATER CYCLE	BLUE TO RED TANK LOSS RATIO	BLUE PERMA-NENT PERS. CASUALTIES PER CYCLE	RED DIVISIONS IN DECIMATION POOL
-2.8	98.0	59.5	1.65	977.	2796.	.35	71562.	38.2

Figure 3-16. Example of Sensitivity Analysis Indicators Report

3-10. SIMULATION PROGRESS REPORT. In addition to the reports produced by the CEM Report Generator, there is a report produced by the CEM program while the simulation is in progress.

a. This report details the operation of the Blue weak on-line division replacement logic. Every division cycle, the divisions in each Blue Army reserve pool, and their states, are listed, as well as the weak on-line divisions subordinate to each Blue Army headquarters and their states. When a decision is made about exchanging a division in an Army reserve pool with a candidate weak on-line division, the strengths of the two divisions are reported in detail.

b. Every division cycle, the cumulative artillery ammunition expended since D-day by each Blue artillery tube type appears in the Simulation Progress Report. This data is used by a special postprocessor to produce the Artillery Tube Use Report.

c. If the firepower of any artillery battalions or maneuver units has been reduced due to shortages of personnel, ammunition, or supplies, a "rationing" report is included in the Simulation Progress Report, tabulating the number of occurrences of these shortages in the division cycle by engagement type (and by national partition on the Blue side).

d. Every 20 division cycles, the Simulation Progress Report gives an accounting of the Blue maneuver battalion ammunition expended, by type of weapon, since D-day.

e. Also, every 20 division cycles, a detailed accounting of Blue personnel combat losses appears in the Simulation Progress Report. This breaks out the Blue combat casualties between dead and wounded, and among noncrew personnel and crews of each type of tank, light armor, and helicopter.

f. The Simulation Progress Report also contains a line every 20 division cycles reporting the numbers of repairable tanks and light armor abandoned on the battlefield since D-day due to adverse FEBA movement.

g. Every 20 division cycles, the Simulation Progress Report includes an outcome force ratio table, which displays, by engagement type, the cumulative number of occurrences, since D-day, of engagement outcome attacker-to-defender force ratios within each of the intervals:

(0.0, 0.5), (0.5, 1.0), (1.0, 1.5), (1.5, 2.0), (2.0, 2.5), (2.5, 3.0), (3.0, 3.5), (3.5, 4.0), (4.0, 4.5), (4.5, 5.0), (5.0, 7.5), (7.5, 10.0), and (10.0, 0.0).

h. Every 20 division cycles, the Simulation Progress Report includes the cumulative number of minisectors occupied by each Blue partition by terrain type and engagement type.

i. A rationing table is printed for each division cycle in which at least one side had insufficient ammunition. The table displays the number of subsectors by Red division/Blue partition and by maneuver battalion and artillery battalion by posture where rationing of ammo occurred.

j. Finally, every two division cycles, the Simulation Progress Report includes the number of Blue partition tanks, APCs, and helicopters, by type, entering maintenance and the number of temporary losses which were replaced during the period.

APPENDIX A

CONTRIBUTORS

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GLOSSARY

ACRONYMS

AC	aircraft
AD	air defense
A/D	attacker/defender
ADA	air defense artillery
ADI	air defense interceptor
APC	armored personnel carrier(s)
AR/I	armed reconnaissance and interdiction
AT/M	antitank/mortar
BAD	Blue attack Red delay
BAHD	Blue attack Red hasty defense
BAPD	Blue attack Red prepared defense
BE	brigade engagements
C^3	command, control, and communications
CA	counterair
CAA	US Army Concepts Analysis Agency
CAS	close air support
CEM	Concepts Evaluation Model
CMIA	captured/missing in action
CONUS	Continental United States
DNBI	disease and nonbattle injuries
DS	direct support
FEBA	forward edge of the battle area
FLOT	forward line of troops
FP	firepower potential

FV	force value
GS	general support
KIA	killed in action
ME	meeting engagement
POL	petroleum, oils, and lubricants
RAD	Red attack Blue delay
RAHD	Red attack Blue hasty defense
RAPD	Red attack Blue prepared defense
SAM	surface-to-air missile
TAC	tactical aircraft
TOS	Tactical Operations Systems
WARF	wartime replacement factor
WIA	wounded in action

INDEX

AD-A182 343 CONCEPTS EVALUATION MODEL VI (CEM VI) VOLUME 2 CEM USER'S HANDBOOK(U) ARMY CONCEPTS ANALYSIS AGENCY BETHESDA MD W T ALLISON AUG 85 CAA-D-85-1-VOL-1 3/3

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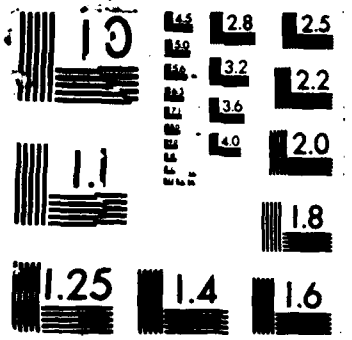
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