LA-SUB--95-109

BDM

LETTER REPORT

LANL HIGH-LEVEL MODEL (HLM) DATABASE DEVELOPMENT

CONTRACT NUMBER: 1598F0013-95
EXPIRATION DATE: 30 NOV 94
SHORT TITLE: LANL HLM DB

CONTRACTOR: BDM FEDERAL, INC.
PROGRAM MANAGER: T.R. HOOKER
TELEPHONE: (703) 848-5943

DISCLAIMER

Portions of this document may be illegible in electronic image products. Images are produced from the best available original document.

LETTER REPORT -
LANL HIGH-LEVEL MODEL (HLM) DATABASE DEVELOPMENT

LANL CONTRACT 1598F0013-95

A. BACKGROUND

1. Introduction

Traditional methods of evaluating munitions have been able to successfully compare like munition's capabilities. On the modern battlefield, however, many different types of munitions compete for the same set of targets. Assessing the overall stockpile capability and proper mix of these weapons is not a simple task, as their use depends upon the specific geographic region of the world, the threat capabilities, the tactics and operational strategy used by both the U.S. and Threat commanders, and of course the type and quantity of munitions available to the CINC.

To sort out these types of issues, a hierarchical set of dynamic, two-sided combat simulations are generally used. The DoD has numerous suitable models for this purpose, but rarely are the models focused on munitions expenditures. Rather, they are designed to perform overall platform assessments and force mix evaluations. However, in some cases, the models could be easily adapted to provide this information, since it is resident in the model's database. Unfortunately, these simulations' complexity (their greatest strength) precludes quick turnaround assessments of the type and scope required by senior decision-makers.

Recognizing this situation, the OUSD(A&T)/S&TS-Office of Munitions sponsored several related methodology development activities [Joint Munitions Assessment Program (JMAP), Threat Model (Threat), and TASCFORM-AMMO (TF-A)] that can be used for quick-look analysis of munitions issues. LANL directed the technical activities as executive agent for OM. The Office of Munitions High-Level Model (HLM) Objective System, shown in Figure 1, includes not only the constituent methodologies, but also the necessary data sources and electronic linkages required to develop, store, manipulate, and download the data to support analyses.

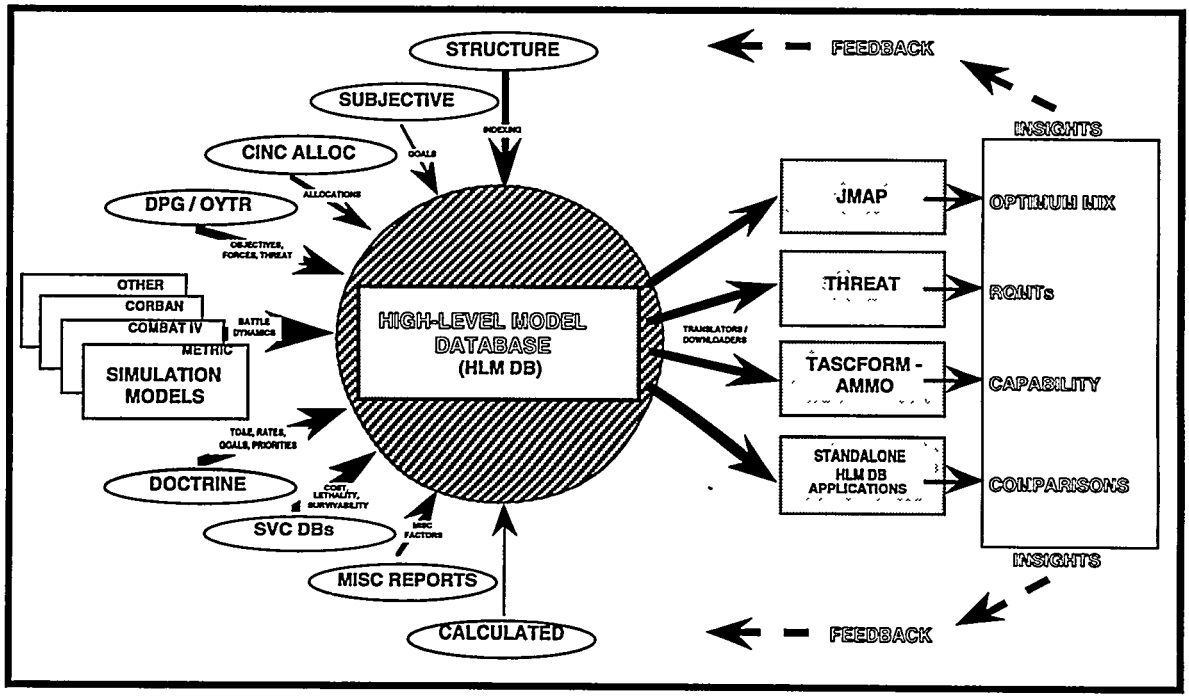


Figure 1. Office of Munitions' High-Level Model (HLM) Objective System

These methodologies, however, depend upon a wide variety of inputs. To date, this data has come from a variety of sources, but has not been comprehensive in nature, nor was it in the form that the methodologies required. Data criticality and consistency, and high-level harmonization, have engendered the requirements for a HLMDB, integration procedures, and subsequent integration of the overall HLM Objective System. This effort responds directly to the HLMDB requirement.

Under a recently completed LANL effort, BDM's Task 1 activities identified all HLM data requirements, post-processor data elements and formats, and structured a post-processor database format. BDM reviewed the data definitions and formats and determined which inputs can be provided by the METRIC, COMBAT IV and CORBAN simulations, and which inputs must be provided from other sources. Based on the data to be provided by the simulation models, BDM developed a desirable format for the post-processor data. BDM also recommended a new HLM data structure and a RDBMS application (Paradox for Windows) for HLM DB development. All Task 1 activities were reviewed with LANL in preparation for proceeding with Tasks 2 and 4.

2. Statement of Work

TASK 2 - DATA SOURCE POST-PROCESSING DESIGN - THE TASK OBJECTIVE IS TO MODIFY THE OUTPUT PROCESSORS OF THE SELECTED DATA SOURCES AND CONDUCT PROOF-OF-CONCEPT FOR A SPECIFIED SCENARIO. BDM SHALL DEVELOP SOFTWARE TO POPULATE THE DATABASES WITH THE FORMAT DEVELOPED IN TASK 1. BDM SHALL THEN CONDUCT PROOF-OF-CONCEPT BY EXERCISING THE SELECTED MODELS AND OTHER DATA SOURCES TO GENERATE A DATA SET FOR THE 1999 KOREA SCENARIO. THE DATA SET WILL BE DOCUMENTED WITH DESCRIPTIONS OF THE SCENARIO, INPUT PARAMETERS AND VALUES, SOURCE REFERENCES, AND OUTPUT. THE DATA WILL BE INSTALLED ON OM / LANL COMPUTER SYSTEMS.

TASK 4 - COMPLETE POST-PROCESSOR IMPLEMENTATION - UPON COMPLETION OF TASK 3, THE DATA SOURCES WILL BE EXERCISED TO COMPLETELY FILL DATABASES FOR OTHER SCENARIOS OF INTEREST TO THE TDA (e.g., EUROPE, SOUTHWEST ASIA, AND OTHER CONTINGENCIES LISTED IN THE DEFENSE PLANNING GUIDANCE). THE DATA SETS WILL BE TRANSFERRED ELECTRONICALLY TO THE OM / LANL COMPUTER SYSTEMS. THE DATA SETS WILL BE DOCUMENTED AS IN TASK 2.

3. Technical Approach and Activities

The ultimate objective of this effort was to develop, deliver and install complete HLM databases for specific OM scenarios of interest. Principal activities included HLM database structure development; additional post-processor development for the METRIC and COMBAT IV AirLand Campaign models and the Corps Battle Analyzer (CORBAN) simulation; exercise of the post-processors and other data sources to fill the HLM database; development of database translators / downloaders to feed the individual HLM methodologies; and delivery and installation on OM and LANL computer systems. This software development effort drew heavily from the existing post-processor capabilities. The post-processors were designed so that any and all future METRIC, COMBAT IV and CORBAN analyses can record data in a format directly usable by the HLM System.

The HLM Objective System has unique capabilities to analyze scenario-dependent munitions issues. This effort provided for initial development of SWA and Korea HLM databases, followed by other scenarios of interest as resources permit. The Korea scenario was the focus of Task 2, due to its current DoD interest, relative maturity and status of existing implementation in selected simulations. Once proof-of-principle was demonstrated in Task 2, the SWA scenario was exercised in Task 4. The overall effort (Tasks 2 and 4 of the LANL Revised SOW) were accomplished by completing two largely similar and concurrent tasks.

Each of the recommended dynamic simulations (METRIC, COMBAT IV and CORBAN) has

particular strengths and applicability to OM HLM database development. METRIC provides a balanced, high resolution picture of the worldwide and theater campaign, to include mobilization and intertheater deployment. COMBAT IV concentrates on the air campaign, tracking the expenditures of A-A, S-A, A-S and deep-strike S-S munitions explicitly over time, in a two-sided, dynamic conflict. CORBAN is a corps-level dynamic two-sided simulation which focuses on the ground battle.

a. Task 2 - Data Source Post-Processing Design

The SOW task objective was to modify the output processors of the selected data sources and conduct proof-of-concept for a specified scenario. Based on the HLM database and post-processor data requirements identified and approved by the LANL TDA in Task 1 previous, BDM modified the simulations' source and executable codes to pull and calculate the required data, and store it in the database format designed in Task 1 and further developed in this task. Since some post-processing capability (mainly platform-oriented) exists, the focus was to expand this capability to provide target/platform/munition data and store it in the objective format. BDM also developed all other required data not provided by the simulations. The product was a HLM Database Korea dataset installed on OM/LANL computer systems.

Major activities under Task 2 included the following, and were based on activities and products delivered in Task 1 previous:

(1) Completed HLM Database structure in Paradox for Windows application;

(2) Finalized selection of Platform/Munition/Target (PMT) combinations and simulation model sources;

(3) Tagged selected PMT combinations (and associated functional and operational logic) to METRIC, COMBAT IV and CORBAN simulations;

(4) Developed custom PMT-structured post-processors for METRIC, COMBAT IV and CORBAN simulations. BDM modified the source and executable codes for each simulation to provide the required data in the required format;

(5) Completed data development from other sources as necessary to fill HLM database. Significant data development was required to generate a complete and consistent dataset. This activity also included selected review of simulation model input data against other sources;

(6) Exercised METRIC, COMBAT IV and CORBAN simulation Korea scenarios and downloaded post-processed data into HLM Korea Database. A key activity was to review the post-processed data and compare it to manually generated data to verify post-processor operation, accuracy and completeness;

(7) To complete this task, BDM documented the post-processor dataset by describing the scenarios, simulation input parameters and values, data source references, and simulation output. Documentation is in the form of working notebooks, extensive notation in electronic files, briefings, and this letter report which summarizes Task 2 and 4 activities.

b. Task 4 - Complete Post-Processor Implementation

The SOW task objective was to exercise scenarios and other data sources to completely fill databases for other scenarios of interest to the LANL TDA. Based on Office of Munitions and LANL direction, BDM developed a SWA HLM Database using simulation post-processor and other data consistent with the Korea scenario and database.

B. HIGH LEVEL MODEL DATA

1. HLM Database

Task 1, completed and reported previously, identified each High-Level Model's [Joint Munitions Assessment Program (JMAP), Threat Model (Threat), and TASCFORM-AMMO (TF-A)] individual data requirements and proposed a database architecture to store, generate and download model-specific data for subsequent assessments. Attachment 1 provides an overview of each High-Level Model's data requirements, and the approach taken to satisfy those requirements in the HLMDB. Attachment 2 provides a data reference and correlation for each HLM data table and its formatted HLMDB source table. Finally, Attachment 3 summarizes the HLMDB structure, data requirements, and data sources.

The HLM data base architecture was driven by multiple development criteria, including common and unique data requirements of the individual high-level models, the desire for a flexible architectural "backbone" enabling easy expansion and evolution within an object-oriented development environment, and delivery of a professional, hierarchical and normalized database management system.

Figure 2 shows the HLM Database structure, the twenty-five constituent HLMDB tables, each table's field structure, and intertable linkages. The data tables in the HLMDB are those required by the specific, unique needs of the three high-level models. Many of the data fields are common between the models and not scenario specific (identified in the graphic as standard text), which can allow single tables to maintain data for multiple models. Some tables exist for the sole requirements of a single model. The set of tables in the architecture is, therefore, the minimum number necessary to embrace the models' needs while incorporating accepted normalized data base design philosophies.

The platform, munition, target and PMT tables are founded on worldwide data. Associated data and any other HLMDB data, may or may not be scenario-specific (identified in the graphic as standard or outlined text). Conversely, some data are based on calculations using data from other tables (identified in the graphic as bold text), and are generally scenario-specific. Calculated data generation follows an explicit chronological order (generalized on the graphic as a sequence from left to right).

During HLMDB data downloads, scenario-specific data for any platform, munition, target or PMT combination is downloaded **only** if all three entities (P, M, T) have scenario inventories greater than zero. That is, the overriding criteria that specifies what "plays" in an HLM scenario is whether an entity's inventory is greater than zero in that scenario.

2. HLM Data

Once the HLMDB structure was modified, refined and finalized, the more challenging effort became data development. As specified in the SOW, two complete datasets, corresponding to 2001-timeframe Korea and SWA scenarios, were developed. The FY96-01 Defense Planning Guidance (DPG) Illustrative Planning Scenarios provided the basis for scenario specificity, scheme of operation, major forces, and time-dependent factors. Detailed platform and target data was fleshed out based on expected unit TO&Es, DIA Outyear Threat Report, and various target templates. Munitions inventory and other data was developed from multiple Service sources. Table 1 summarizes the principal data sources by type data. Bolded entries denote primary sources, while unbold entries note secondary and/or other data sources. Additional audit information is contained in individual cell notations and working notes.

First, it is possible that a target can exist for which no *realistically capable* munition exists to attack it. Subsequently, no *realistic* munition/target pair can exist, and, therefore, no PMT combination should occur. Secondly, for every munition in the inventory there *must be* a platform that can deliver it. Therefore, *realistic* platform/munition pairs should necessarily occur in any table that has both munition and platform ID fields. Ultimately, munition/target and platform/munition combinations should be based on realism and profession judgment to avoid dubious model results.

ITEM	DATA SOURCES
P QUANTITY	DPG SCENARIO, POM96, TO&Es, TF-A INPUT
P COST	ARMYLOG, SB 700-20, NNOR, NCAA, AFR 173-XX
P MOP	TASC
P AVAILABILITY RATE	DPG, POM96, NCAA, NNOR BACKUP, DS DATA, SVC M / PF / DBs
P ABORT RATE	NCAA, NNOR, SVC M / PF / DBs, DS DATA
P RECONSTITUTION RATE	SIMULATION MODELS, SVC M / PF / DBs, DS DATA, MISC REPORTS, JUDGE
P ABORT MUN LOST	NCAA, NNOR BACKUP, SVC M / PF / DBs, DS DATA, JUDGMENT
P ATTRIT MUN LOST	SVC M / PF / DBs, DS DATA, JUDGMENT
P ALLOCATION	SIMULATION MODELS, DS DATA, SVC M / PF / DBs, JUDGMENT
P ENGAGEMENT RATE	DPG, SIMULATION MODELS, DS DATA, SVC M / PF / DBs
P MAX ATTRIT RATE	SVC DOCTRINE, SIMULATION MODS, DS DATA, SVC M / PF / DBs, JUDGMENT
P ATTRITION RATE	SIMULATION MODELS, DS DATA, SVC M / PF / DBs
P FALSE TGT RATE	SIMULATION MODELS, DS DATA, SVC M / PF / DBs, MISC REPORTS, JUDGMENT
M QUANTITY	WARS, MIDP, DAMO-FD, CAIMS, AF/XOFM, HQ MARINE CORPS, SOCOM
M COST	DOD CONSOL AMMO CAT, AFR 173-XX, USAF SUPPL, CAIMS
M DOCTRINAL EXPEND	NCAA, NNOR, SVC M / PF / DBs, FMs/TMs, JUDGMENT
M STOCKS LOSS RATE	NCAA, SVC M / PF / DBs, JUDGMENT
PM LOADOUT	NCAA, NNOR, DS DATA, JMEM, JANE'S/INTERAVIA, SVC M / PF / DBs
PMT A/C LOADOUT	JMEM, JANE'S, INTERAVIA, SVC M / PF / DBs
PM MAX RATE	JMEM, JANES, INTERAVIA, CALCULATION, SVC M / PF / DBs
PMT SSPK / *SSPK STD DEV*	SIM MODELS, SVC M / PF / DBs, AMSAA, MICOM, NAWC, NAVSEA, EGLIN, JMEMs, MISC RPTS
PMT SALVO SIZE	NCAA, NNOR, WEAPONEERING JUDGMENT, SVC M / PF / DBs
PMT SALVOS/ENCOUNT	WEAPONEERING JUDGMENT, SVC M / PF / DBs
PMT MUNITIONS PRIORITY	NCAA, NNOR, WEAPONEERING JUDGMENT, SVC M / PF / DBs
PMT ATTRIT	NCAA, NNOR, SIM MODELS, SVC M / PF / DBs
T QUANTITY	DPG, OYTR, DIA SUPPL, CMMP COMPENDIUM, TEMPLATES
T COMPOUND	SVC M / PF / DBs, JUDGMENT
T MOP	TASC
T ALLOCATIONS	CINCs / J-8, SVC M / PF / DBs, JUDGMENT
T PRIORITY	NCAA, NNOR, SVC DOCTRINE, SVC M / PF / DBs, JUDGMENT
T DESTRUCTION GOALS	CINCs / J-8, SVC M / PF / DBs, JUDGMENT
T RECONSTITUTION RATE	SIM MODELS, NNOR BACKUP, SVC M / PF / DBs, MISC REPORTS, JUDGMENT
T FALSE	SVC M / PF / DBs, MISC REPORTS - DTIC, SIM MODELS, JUDGMENT

Table 1. HLMDB Data Sources

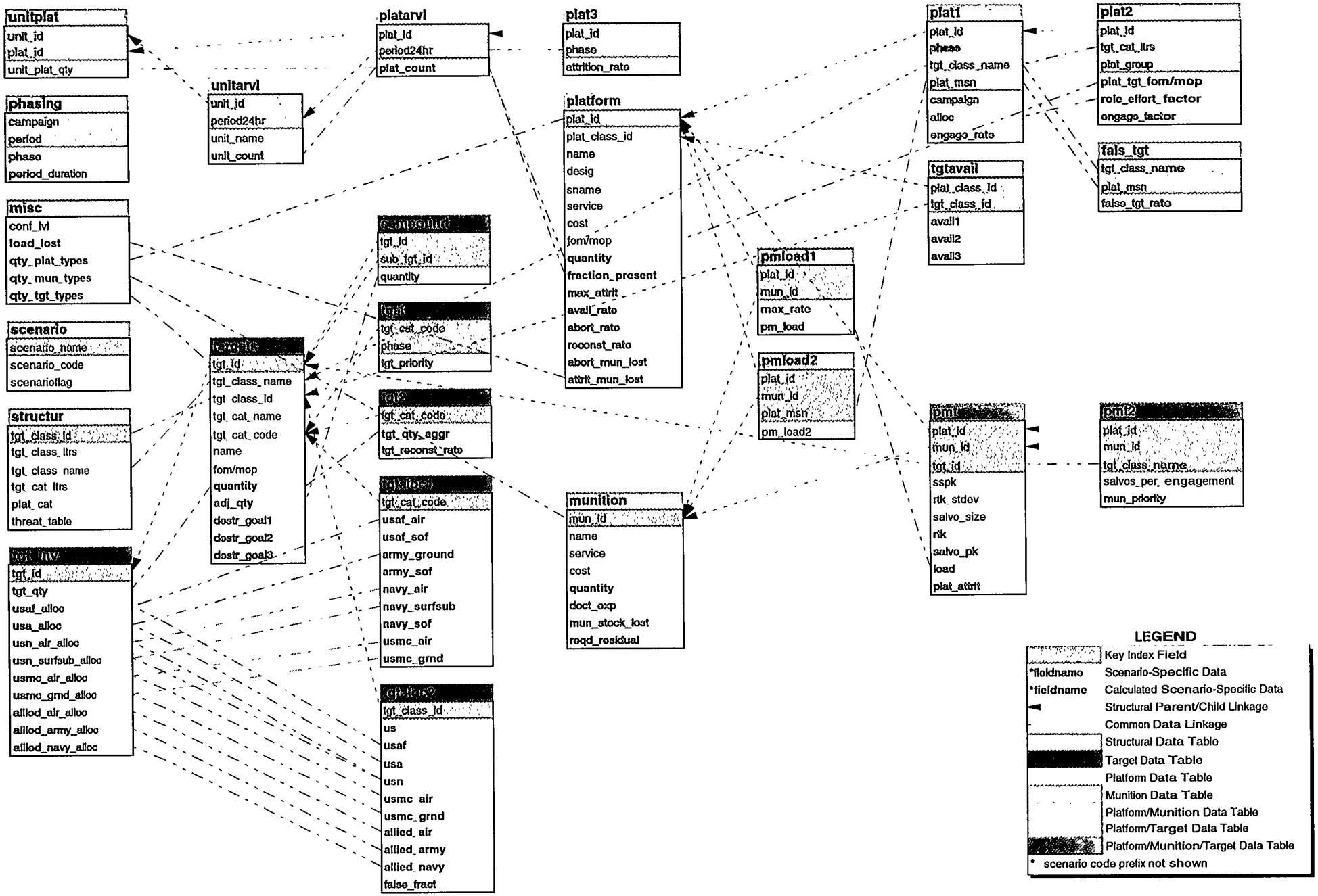
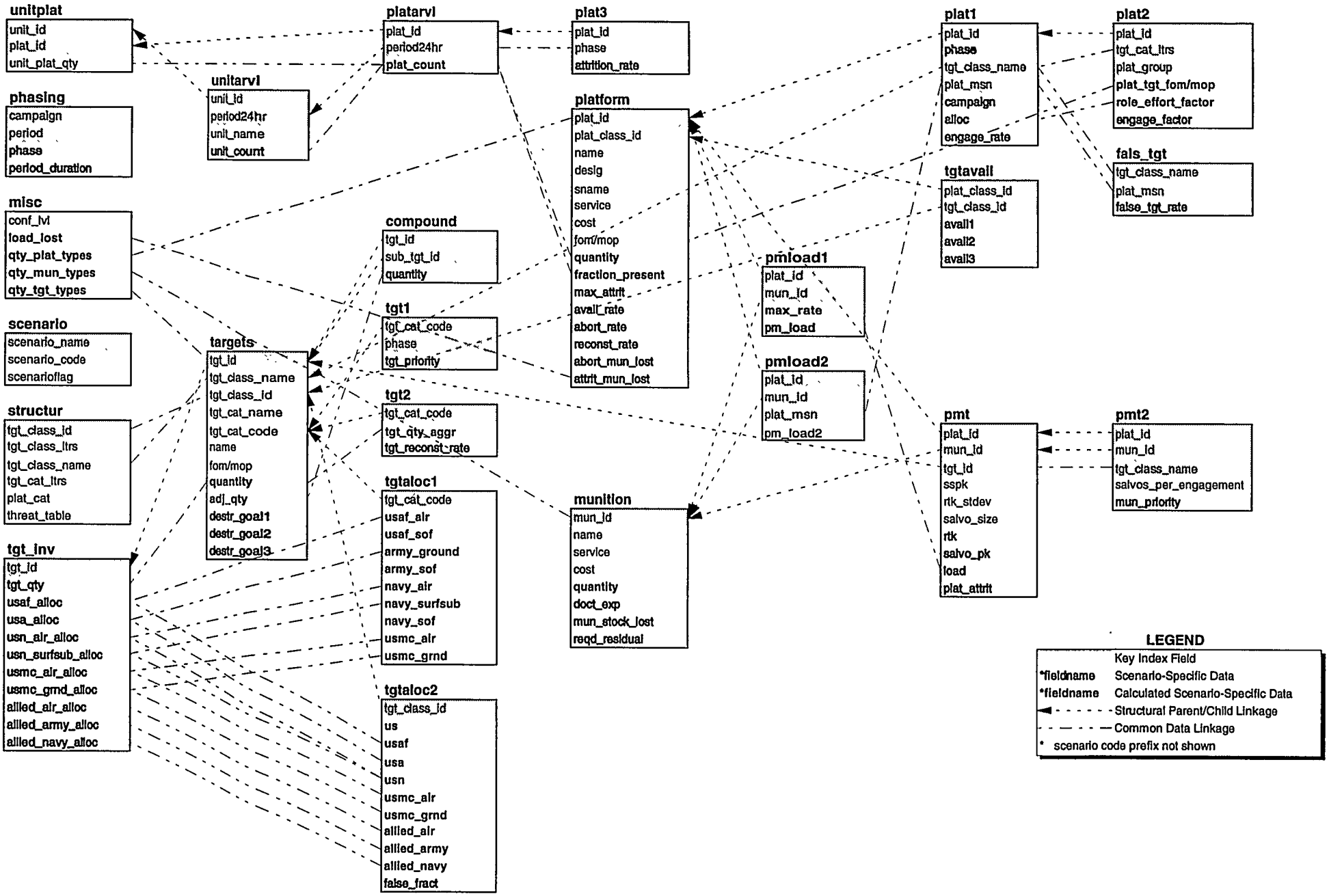


Figure 2. HLMDB Database Structure

HLMDB STRUCTURE GRAPHIC

12:04 PM, 2/23/95



C. HLM DATABASE OPERATION

1. Introduction

The HLMDB provides users a graphical user interface to request data downloads for the high-level models. The existing interface is a beta (incomplete) version of the anticipated HLMDB Objective System, but is fully operational for HLM data downloads.

Each high-level model needs a subset of the HLMDB data set. The system provides a data download to a model-specific, scenario-specific subdirectory or removable media following an explicit and programmed order of events. The events are described briefly below:

A. A complete copy of the HLMDB file set is copied to a temporary subdirectory;

B. Not all data is stored explicitly in all the fields of the tables. Rather, because of the calculated and non-calculated field relationships described in 'Database Structure,' a subroutine executes to complete the necessary calculations;

C. Lastly, a downloader is executed to provide the requested model's expected and required data set in appropriately structured files. As an example, Attachment 4 contains the Paradox script for HLMDB manipulation and download for JMAP.

2. JMAP Model

The HLMDB system fully supports JMAP data requirements. The JMAP data downloader copies fifteen tab delimited ASCII text files (each corresponding to a subsection of the JMAP "fort1" input file) to a floppy disk drive of the HLMDB IBM-compatible machine. The resulting files need to be copied to the JMAP working directory on the user's Sun Sparc workstation. This operation requires that either an IBM-compatible drive is available on the user's Sun Sparc workstation, or that a classified network, with the necessary floppy drive integrated, be available. Lastly, the supplied UNIX script file "createJMAP" must be executed from within the JMAP working directory to generate the single "fort1" input file sought by the JMAP algorithm.

3. THREAT Model

The HLMDB system fully supports THREAT data requirements, but a minor problem interferes with THREAT's successful use of HLMDB downloaded data. The current THREAT code processes aircraft platform data differently from how it processes non-aircraft platform data, and, therefore, it is "hard-wired" to expect Air Force, Navy and USMC aircraft platforms to occur on specific rows of the input platform list. The more complete and updated HLMDB-provided platform list is inconsistent with the THREAT code's expectations.

This issue can be addressed through one of the following two options:

a) Modify the current THREAT code, while staying within the RBase software environment, to identify aircraft platforms within the platform list (via "flags" or other identifiers), and, therefore, accept variability in platform positioning within the platform list downloaded by the HLMDB.

b) Translate the THREAT algorithm into the Borland Paradox for Windows RDBMS environment. The benefits of this translation would be to: 1) eliminate the current code's "hard-wired" platform positioning requirement; 2) move the code to a more modern, faster, Windows-based, and object-oriented software environment; 3) greatly simplify and expedite HLMDB data download operations to the THREAT methodology.

4. TASCFORM-AMMO (TF-A) Model (Ver 2.0)

The HLMDB has been structured and populated with all necessary data to fulfill TASCFORM-AMMO (TF-A) data requirements. The HLMDB mechanism for downloading data to TF-A has been developed to approximately 90 percent completion. The remaining development includes methodology refinement to address the issues noted below, and error checking.

The TF-A model is distinctly different from the JMAP and THREAT models; it is the only model hosted in a spreadsheet environment (Microsoft Excel). A scenario's data are stored in a set of flat files (spreadsheets) whose formats are standardized between scenarios. A library of macro routines execute TF-A calculations using data from the flat files as identified via spreadsheet named ranges (references to data by their *position* in the file). The named ranges were manually constructed by the TF-A developers, and are, therefore, "hard-wired" to the flat files and in the macro code.

The HLMDB manipulates original TF-A source flat files (but as "tables" in the Paradox environment) that contain no detailed data. Scenario-specific data is inserted into appropriate "cells" corresponding to the hard-wired platforms, munitions and targets, and PMT combinations. The filled TF-A files are then exported in Excel format. It is essential that the HLMDB output file formats conform exactly to the original Excel source file formats. The spreadsheet named ranges described above must be "overlayed" onto the HLMDB files for TF-A to function correctly; named ranges can not be maintained in Paradox. The named range associations can be established if each whole HLMDB file is "pasted" into/over the corresponding, existing TF-A flat file. A short Excel macro can be written to greatly simplify this task.

A key issue impeding complete HLMDB/TF-A integration involves the "flag" mechanism used to identify and track individual platforms, munitions and targets. Arbitrary, but unalterable ID numbers have been associated with each platform, munition and target in the HLMDB for over a year. Numbers are used to track entities instead of entity names to speed indexing operations and to sidestep the impact of typing mistakes. It is critically important that TF-A and the HLMDB use the same identification numbers to assure the two data environments are compatible. Over time, however, the two developments diverged in their identification schemes sufficiently enough to hamper integration. The only complete solution is to modify the TF-A macro codes to accommodate HLMDB ID numbers.

D. SUMMARY

The HLMDB development effort was an extremely challenging effort, both technically and managerially. It spanned almost two years in planning and administrative lead, and then almost one year in development once the contract was awarded. Over that time, scenarios, timeframes, platform and munition availability and many other data factors changed appreciably. In addition, the TASCFORM-AMMO code was extensively rewritten, producing TF-A version 2.0. The overall effort accommodated these and other changes to produce a viable dataset current in scope and application.

The HLMDB structure and data was specifically developed for the High-Level Models, but a potentially more valuable use is in its use in various standalone applications and data requests. In fact, HLMDB data has already been used to support assessments prepared for the J-8 Strike Joint Warfare Capabilities Assessment, the OSD Precision Strike Architecture Review Group, the Joint Staff Nimble Dancer wargame series, and the Office of Munitions. Many additional standalone applications are planned over the next year.

The development status, in terms of the LANL SOW, is 100% complete with the exception of the several issues (noted earlier) associated with the THREAT and TF-A models. These issues, while relatively minor, preclude full and successful model operation until resolved. BDM estimates that ~1 month LOE will be required, and recommends committing these resources to bring the full HLM Objective System online.

ATTACHMENT 1

HLM DATA REQUIREMENTS OVERVIEW

OVERVIEW

DATA STRUCTURES:

AMMO: Data is input through a large, structured, two-dimensional Excel spreadsheet file.
JMAP, THREAT: Data is input as a series of indexed flat files corresponding to DB tables.
HLMDB: Maintain a series of relational database tables with all data. Output data using multiple table joins.

PLATFORM DATA:

AMMO: Platform types are aggregated into platform sets associated with each platform role and target category. Four platforms are allowed per set; three sets are allowed per mission. Currently, AMMO does not differentiate between services.
JMAP, THREAT: Platform types are flexible depending on input database.
HLMDB: Maintain individual, svc-specific platform types and data. Aggregate as necessary.

MUNITION DATA:

AMMO: Munition types are aggregated into munition sets specific to each platform role/target category.
JMAP, THREAT: Munition types are flexible depending on input database.
HLMDB: Maintain individual, svc-specific munition types and data. Aggregate as necessary.

TARGET DATA:

AMMO: Target types are aggregated into target sets.
JMAP: Target types are flexible depending on input database. Targets are aggregated into target classes for some calculations.
THREAT: Target types are flexible depending on input database. Targets are aggregated into target categories for some calculations.
HLMDB: Maintain individual target types and data. Aggregate as necessary .

PMT COMBINATIONS, ALLOCATIONS, AND ENGAGEMENT DATA:

AMMO: Structure based on target category/platform role combinations, with extensive aggregation by platform set, target category, target set, and munition set.
JMAP: Structure based on individual PMT combinations, with some aggregation by tgt class.
THREAT: Structure based on individual PMT combinations, with some aggregation by service and target category.
HLMDB: Maintain structure to accommodate the most disaggregated model data input requirement for each data area. This necessitates structures specific to individual PMT combinations, as well as aggregations by platform set, target category, target class, target set, and munition set.

PLATFORM DATA

PLATFORM QUANTITIES

AMMO: Scenario Platform Inventory: Quantity of platforms in the scenario, currently, independent of service. Specific to: platform
JMAP, THREAT: Platform Qtty: Quantity of service-specific platforms in the scenario. Specific to: platform
HLMDB: Maintain platform quantities by service. Aggregate for AMMO.

PLATFORM COST

JMAP: Platform Cost: Cost in millions of dollars. Specific to: platform

THREAT: Platform Cost: Cost in thousands of dollars. Specific to: platform

HLMDB: Maintain costs in thousands of dollars and calculate as necessary.

PLATFORM FOM

AMMO: MOE: Relative measure of effectiveness. Specific to: plat, plat role, and tgt category

JMAP: Platform Value: Relative platform value. Specific to: platform

THREAT: FOM/Platform Score: Relative figure of merit. Specific to: plat and tgt category

Adjusted Platform Score: The FOM multiplied by a tgt engagement factor which adjusts for the platform's ability to achieve contact with the tgt category. Specific to: plat and target category

HLMDB: Maintain platform FOMs specific to platform role and target category. Aggregate for JMAP and THREAT.

PLATFORM AVAILABILITY

AMMO: Initial % Force Available, Days to Reinforce at Linear Rate: Percentage of platforms available for combat in period one, and the number of days over which they are linearly reinforced. Specific to: platform role

Percent Force Pindown, Recovery Period: Percentage of platforms pinned down during the initial period, and number of periods for full recovery (at linear rate). Specific to: platform set (platform role, target category)

Percent Platforms not Usable, Percent Required Residual: Percentage of platforms which are not usable this scenario, or which are not usable because they are required as a residual. Specific to: platform set (platform role, target category)

THREAT: Time Phase Factor: Fraction of time a platform is available in the scenario. Specific to: platform

HLMDB: Maintain Initial % Force Available and Days to Reinforce. Calculate time-phase factor. Maintain Force Pindown, Platforms not Usable, and Required Residual Factors.

MUNITIONS DATA

MUNITIONS QUANTITIES

AMMO: Scenario Munition Inventory: Qty of munitions in the scenario, indep of service. Specific to: munition series

JMAP, THREAT: Munition Quantity: Quantity of munitions in the scenario. Can be specific to svc, depending on the identification and quantification of the munition data input. Specific to: munition

HLMDB: Maintain individual munition quantities by service. Aggregate for AMMO.

MUNITION COST

JMAP: Munition Cost: Cost in dollars. Specific to: munition

THREAT: Munition Cost: Cost in thousands of dollars. Specific to: munition

HLMDB: Maintain costs in dollars and calculate as necessary.

MUNITIONS LOST

AMMO: Percent Munitions Lost on Killed Platforms: Percentage of a munition load lost when friendly platform attrited. Specific to: platform set (platform role, target category)

Percent Lost Per Day from Munition Stockpile: Percentage of day's munition inventory lost due to enemy action and accidents. Specific to: platform set (platform role, target category)

JMAP: Fraction Load Lost By Attrition: Fraction of a munition load lost when friendly platform is attrited. Specific to: scenario

HLMDB: Maintain percent munitions lost on killed platforms specific to platform set. Calculate scenario Fraction Load Lost. Maintain Percent Lost Per Day from Munition Stockpile specific to platform set.

TARGET DATA

TARGET QUANTITIES

AMMO: Scenario Target Inventory: Quantity of aggregated target sets in the scenario. Specific to: target set

JMAP, THREAT: Target Quantity: Quantity of targets in the scenario. Specific to: target

HLMDB: Maintain quantities of specific targets. Aggregate into target sets for AMMO.

COMPOUND TARGETS

JMAP: Compound targets are treated as target types and are identified along with the quantities of each sub-target contained within them. Specific to: target

THREAT: Adjusted Tgt Qty: Qty of targets minus # contained in other compound targets. Specific to: target

HLMDB: Maintain Compound Target lists with quantities. Calculate Adjusted Target Quantities for THREAT.

FALSE TARGETS

AMMO: False Targets: Quantity of false tgts 'allocated' to each tgt category and plat role. Real Target Percent: Frac of a tgt category (real + false targets) which are real. Specific to: target category, platform role

JMAP, THREAT: False targets are entered as target types for each target class. Quantities of false targets are determined as a fraction of real targets in the class. Specific to: target class

HLMDB: Maintain false targets as a target types in each target class. Maintain a False Tgt Fraction for each class corresponding to the fraction of false tgts to real targets. Calculate false target allocations to platform role/target category for AMMO.

TARGET FOM

AMMO: MOE: Relative measure of effectiveness. Specific to: target set

JMAP, THREAT: Target Value/FOM: Relative target figure of merit. Specific to: target

HLMDB: Maintain FOMs for specific targets. Aggregate for AMMO target sets.

REPAIR RATE

AMMO: Percent Targets Lost - Fixed: Percentage of targets killed which are repaired and returned to the battle five periods later. Specific to: target set

HLMDB: Maintain Percent Targets Lost - Fixed

ALLOCATION AND DISTRIBUTION DATA

AMMO: Platform Allocation: Frac of a platform qty allocated to role against tgt category. Specific to: platform, platform role, target category

Munition Allocation: Frac of a mun qty allocated to a role against a tgt category. Specific to: munition, target category, platform role

Target Allocation: Fraction of a target set allocated to a platform role. Specific to: target set, platform role

JMAP: Target Allocation to U.S.: Fraction of a TC allocated to U.S. forces (vice allies). Specific to: target class

THREAT: Target Allocation to Services: Fraction of a target class allocated to a specific service (U.S. or allies / USAF, USA, USN, USMC Air, USMC Ground). Specific to: target class

Role-Effort Factor: Fraction of a platform's mission efforts devoted to a target category. Factors sum to 1.0 for a platform. Specific to: platform, target category

HLMDB: Maintain target allocations to service. Aggregate for JMAP allocation. Maintain platform, munition and target allocations for AMMO. Maintain Role-Effort Factors for THREAT. Use service doctrine and simulation models to supply allocations. Establish links from AMMO target

allocations to THREAT and JMAP target allocations. Establish links from THREAT's Role-Effort Factor to AMMO's Platform Allocation.

PLATFORM-MUNITION-TARGET DATA

PK

AMMO: Salvo PK: PK for a standard salvo (AMMO). Specific to: munition set, target set, platform role

Payload Utility - Unguided, Payload Utility - Guided: Factors which represent a platform's capabilities in a specific role against a platform category. This factor is multiplied by salvo PK to get a PK specific to platform. Specific to: target category, platform, platform role

Exponent - RSS vs PKN: An exponent factor which accounts for a reduced PK if salvo size is reduced by the % of Full Salvo Fired Factor. Specific to: platform set (mission, target category)

JMAP, THREAT: Rounds to kill, RTK standard deviation: Number of rounds required to kill a target plus standard deviation. Specific to: platform, munition, target

HLMDB: Maintain single-shot PKs (SSPK) for each pmt combination. Calculate salvo PKs for AMMO using AMMO salvo size. Maintain Exponent - RSS vs PKN Factors. Calculate rounds-to-kill RTK from SSPK, assuming RTK is geometrically distributed. Maintain RTK standard deviations (assuming RTK is normally distributed) from service databases and subjective inputs, but investigate direct calculation of standard deviation based on geometric distribution characteristics.

SALVO SIZE

AMMO: Munitions/RSS: Number of munitions in a standard munition set salvo used against a target category, independent of platform. Specific to: munition set, target category

Salvos per Encounter: Number of salvos of a munition set used against a target category by a platform set. Munitions/RSS times Salvos per Encounter equals the quantity of a particular munition set delivered by a platform set at a target category during an encounter. Specific to: munition set, platform set (mission, target category)

% of Full Salvo Fired: Percentage of representative salvo to be fired each period (if less than one, will reduce munition consumption rates). Specific to: platform set (mission, target category)

JMAP, THREAT: Rounds/Engagement (salvo): Number of rounds of a munition delivered by a platform at a target in one engagement. Specific to: platform, munition, target

HLMDB: Maintain Standard Salvo Size for each munition/target combination, and Salvos per Encounter for each platform set. Calculate Salvo Size for each pmt combination.

PLATFORM-MUNITION LOAD-OUTS

AMMO: Shares: Percentages indicative of the distribution of munitions normally carried by a particular platform set. The share percentages add to 1.0 for a given platform set. The model will consume munitions according to the distribution. Specific to: munition set, platform set (mission, target category)

JMAP: Load-out: Average munition load-out of a specific munition on a platform, regardless of mission or target. Specific to: platform, munition

THREAT: Load-out: Average munition load-out of a specific munition on a platform, regardless of mission or target. Uses inputs for non-aircraft platforms only, and calculates the average load-out for aircraft based on Aircraft Initial Load-outs. Specific to: platform, munition

Aircraft Initial Load-out: Platform initial load-out for aircraft only. Specific to: platform, munition, target

HLMDB: Maintain munition load-outs specific to munition and target category for aircraft platforms. Maintain munition load-outs specific to platform for non-aircraft. Maintain AMMO Share fractions for each platform set. Investigate linking Shares and Load-outs.

ENCOUNTER AND ENGAGEMENT FACTORS

ENCOUNTER-ENGAGEMENT RATES

AMMO: Encounters/Platform/Day - Start Encounters/Platform/Day - End Encounters/Platform/Day - Curve Number of encounters between a specific platform set and target category per day at start and end, and a parameter determining the shape of the curve between them. Specific to: platform set (platform role, target category)

JMAP: Target Availability: Fraction representing the availability of a target class to a platform class in a particular phase of the scenario. Specific to: platform class, target class, phase

Fraction of Targets to Be Killed: Fraction of targets to be killed in each phase. Specific to: target, phase

THREAT: Engagement Factor: Relative ability of a platform to achieve contact with a target. This factor is multiplied by the Platform FOM to get an "adjusted platform score." Specific to: platform, target category

HLMDB: Maintain Encounter factors, Target Availabilities, Target Destruction goals, and Engagement factors. Investigate linking Target Availabilities and Engagement Factors.

TARGET PRIORITIES

AMMO: Target Priorities: Relative priority of a target set to a platform set within a platform role. Fractions add to one for a platform set. Specific to: target set, platform set (platform role, target category)

HLMDB: Maintain Target Priorities for each target set/platform set.

ATTRITION RATES

AMMO: Attrition rate at start (fraction) Attrition rate at end (fraction) Attrition rate shape Specific to:. platform set (platform role, target category)

Percent Platforms Lost-Fixed: Percentage of platforms lost through attrition which are repaired and returned to the force five periods later. Specific to: platform set (platform role, target category)

JMAP, THREAT: Attrition per engagement: Fraction of pmt engagements that result in attrition. Specific to: platform, munition, target

JMAP: Maximum Attrition: Maximum platform attrition for the scenario, based on doctrine (fraction of platforms). Specific to: platform

HLMDB: Maintain Attrition per Engagement and Maximum Attrition. Maintain AMMO platform set Attrition Rates. Investigate linking platform set Attrition Rates with Attrition per Engagement and Encounter Rates.

CONFIDENCE LEVELS AND RANDOMNESS FACTORS

AMMO: Randomness Factor: 1.0 = perfect C3I/target acquisition, 0.0 = zero discrimination. Specific to: platform set (platform role, target category)

JMAP: Confidence Level: Statistical confidence level associated with achieving a goal based on variable rtk's. Specific to: scenario

HLMDB: Maintain a Randomness Factor for each platform set. Maintain a Confidence Level and a Probability of Kill Goal.

ATTACHMENT 2

HLM / HLMDB TABLE CORRELATION

THREAT/HLM TABLE CORRELATION

bold = source table key field
outline = scenario specific data

Tbl No.	THREAT Element	THREAT Format	THREAT Example	Delivered Format	HLMDB Element	Table Notes	Calculations Before Query
Table 1: platforms							
	plat_number	integer	5	SN (1-999)	**=platform.plat_id**		
	platform_name	text (40 char)	F-16 Fighting Falco	A (40)	=platform.name		
	quantity	integer	200	N (0-99999)	**=platform.quantity**		
	k_cost (thousands)	double	35000	N (1-9999999)	=platform.cost		
	service	text (8 char)	USAF	A (8)	=platform.service		
Table 2: targets							
	target_number	integer	53	SN (1-999)	**=targets.tgt_id**		
	target	text (40 char)	BMP-1/2 APC	A (40)	=targets.name		
	original_quantity	integer	1800	N (0-99999)	**=targets.quantity**		
	target_class	text (4 char)	MHMS	A (4)	=structur.tgt_cat_ltrs	targets & structur	
	comments	text (80 char)	-	A (80)	=targets.comments		
	adj_quantity	double	1352	N (0-99999)	**=targets.adj_qty**		
Table 3: munitions							
	service	text (8 char)	USAF	A (5)	=munition.service		
	muntn_number	integer	8	SN (1-999)	**=munition.mun_id**		
	munition	text (40 char)	AGM-65G Maverick	A (40)	=munition.name		
	quantity	integer	500	N (0-999999)	=munition.quantity		
	k_cost (dollars)	double	120000	N (0.1-9999, .x)	=munition.cost/1000		
Table 4: allocation_to_serv							
	target_class	text (4 char)	MH	A (4)	=tgtaloc2.tgt_class_id	tgtaloc2 & structur	
	usaf	double	(fraction)	N (0-1, x.xx)	**=tgtaloc2.usaf**		
	usarmy	double	(fraction)	N (0-1, x.xx)	**=tgtaloc2.usa**		
	usnavy	double	(fraction)	N (0-1, x.xx)	**=tgtaloc2.usn**		
	usmc_air	double	(fraction)	N (0-1, x.xx)	**=tgtaloc2.usmc_air**		
	usmc_ground	double	(fraction)	N (0-1, x.xx)	**=tgtaloc2.usmc_grnd**		
	rok_air	double	(fraction)	N (0-1, x.xx)	**=tgtaloc2.allied_air**		
	rok_ground	double	(fraction)	N (0-1, x.xx)	**=tgtaloc2.allied_grnd**		
	rok_sea	double	(fraction)	N (0-1, x.xx)	**=tgtaloc2.allied_navy**		
Table 5: usaf_effectiveness					(for platform.service = USAF):	pmt & platform	
	plat_number	integer	5	SN (1-999)	**=pmt.plat_id**		
	muntn_number	integer	8	SN (1-999)	**=pmt.mun_id**		
	target_number	integer	53	SN (1-999)	**=pmt.tgt_id**		
	plat_attrition	double	0.003	N (0-1, x.xxx)	**=pmt.plat_attrit**		
	rnds_engagement	double	2	N (1-9999)	=pmt.salvo_size		
	rnds_kill	double	3	N (1-999, .x)	=pmt.rtk		
	stdevl1	double	0	N (1-999, .xx)	=pmt.rtk_stdev		
	kcost_per_kill	double	(number)	N (1-999999)	(calculated by THREAT)	Restruct QBE table	
	loadouts	double	8	N (1-9999)	=pmt.load		

bold = source table key field
outline = scenario specific data

Tbl No.	THREAT Element	THREAT Format	THREAT Example	Delivered Format	HLMDB Element	Table Notes	Calculations Before Query
Table 6: army_effectiveness					(for platform.service = USA):	pmt & platform	
	plat_number	integer	5	SN (1-999)	**=pmt.plat_id**		
	muntn_number	integer	8	SN (1-999)	**=pmt.mun_id**		
	target_number	integer	53	SN (1-999)	**=pmt.tgt_id**		
	plat_attrition	double	0.003	N (0-1, x.xxx)	**=pmt.plat_attrit**		
	rnds_engagement	double	2	N (1-9999)	=pmt.salvo_size		
	rnds_kill	double	3	N (1-999, .x)	=pmt.rtk		
	stdevl1	double	0	N (1-999, .xx)	=pmt.rtk_stdev		
	kcost_per_kill	double	(number)	N (1-999999)	(calculated by THREAT)	Mod QBE result table to add field	
Table 7: usn_effectiveness					(for platform.service = USN):	pmt & platform	
	plat_number	integer	5	SN (1-999)	**=pmt.plat_id**		
	muntn_number	integer	8	SN (1-999)	**=pmt.mun_id**		
	target_number	integer	53	SN (1-999)	**=pmt.tgt_id**		
	plat_attrition	double	0.003	N (0-1, x.xxx)	**=pmt.plat_attrit**		
	rnds_engagement	double	2	N (1-9999)	=pmt.salvo_size		
	rnds_kill	double	3	N (1-999, .x)	=pmt.rtk		
	stdevl1	double	0	N (1-999, .xx)	=pmt.rtk_stdev		
	kcost_per_kill	double	(number)	N (1-999999)	(calculated by THREAT)	Restruct QBE table	
	loadouts	double	8	N (1-9999)	=pmt.load		
Table 8: usmc_effectiveness					(for platform.service = USMC):	pmt & platform	
	plat_number	integer	5	SN (1-999)	**=pmt.plat_id**		
	muntn_number	integer	8	SN (1-999)	**=pmt.mun_id**		
	target_number	integer	53	SN (1-999)	**=pmt.tgt_id**		
	plat_attrition	double	0.003	N (0-1, x.xxx)	**=pmt.plat_attrit**		
	rnds_engagement	double	2	N (1-9999)	=pmt.salvo_size		
	rnds_kill	double	3	N (1-999, .x)	=pmt.rtk		
	stdevl1	double	0	N (1-999, .xx)	=pmt.rtk_stdev		
	kcost_per_kill	double	(number)	N (1-999999)	(calculated by THREAT)	Restruct QBE table	
	loadouts	double	8	N (1-9999)	=pmt.load		
Table 9: fom_table_name							
	target_class	text (4 char)	MHMS	A (4)	=structur.tgt_cat_ltrs		
	name_of_table	text (20 char)	mobile_hard_soft	A (20)	=structur.threat_table		

THREAT/HLM TABLE CORRELATION

bold = source table key field
outline = scenario specific data

Tbl No.	THREAT Element	THREAT Format	THREAT Example	Delivered Format	HLMDB Element	Table Notes	Calculations Before Query
Table 10: fixed_hard_soft					(for plat2.tgt_cat_ltrs = FHFS):		
	system	text (30 char)	F-16 fighting Falco	A (40)	=platform.name	platforms & plat2	
	country	text (5 char)	USAF	A (8)	=platform.service	platforms & plat2	
	force_level	integer	200	N (0-99999)	(calculated)	**=platform.plat_adj_qty ??**	
	time_phase	double	(number)	N (0-100, x.xx)	=platform.fraction_present	platforms & plat2	
	effort_factor	double	(fraction<=1)	N (0-1, x.xxx)	**=plat2.role_effort_factor**		
	engagement_factor	double	(fraction<=1)	N (0-1, x.xxx)	**=plat2.engage_factor**		
	fom	double	16.7	N (1-999, x.x)	=plat2.plat_tgt_fom		
	tasc_category	text (5 char)	TCAIR	A (5)	=platform.tasc_group	platforms & plat2	
	plat_category	text (5 char)	air	A (5)	=structur.plat_cat	platforms.plat_class_id & structur.tgt_class_id	
	target_class	text (4 char)	FHFS	A (4)	=plat2.tgt_cat_ltrs		
	adj_force_level	double	(number)	N (xxxx.x)	(calculated by THREAT)	Restruct QBE table	
	adj_fom	double	(number)	N (xxxx.x)	(calculated by THREAT)	Restruct QBE table	
	fom_force_level	double	(number)	N (xxxx.x)	(calculated by THREAT)	Restruct QBE table	
	plat_number	integer	5	SN (1-999)	**=plat2.plat_id**		
Table 11: mobile_hard_soft					(for plat2.tgt_cat_ltrs = MHMS):		
	system	text (30 char)	F-16 fighting Falco	A (40)	=platform.name	platforms & plat2	
	country	text (5 char)	USAF	A (8)	=platform.service		
	force_level	integer	200	N (0-99999)	(calculated)	**=platform.plat_adj_qty ??**	
	time_phase	double	(number)	N (0-100, x.xx)	=platform.fraction_present	platforms & plat2	
	effort_factor	double	(fraction<=1)	N (0-1, x.xxx)	**=plat2.role_effort_factor**		
	engagement-factor	double	(fraction<=1)	N (0-1, x.xxx)	**=plat2.engage_factor**		
	fom	double	16.7	N (1-999, x.x)	=plat2.plat_tgt_fom		
	tasc_category	text (5 char)	TCAIR	A (5)	=platform.tasc_group	platforms & plat2	
	plat_category	text (5 char)	air	A (5)	=structur.plat_cat	platforms.plat_class_id & structur.tgt_class_id	
	target_class	text (4 char)	MHMS	A (4)	=plat2.tgt_cat_ltrs		
	adj_force_level	double	(number)	N (xxxx.x)	(calculated by THREAT)	Restruct QBE table	
	adj_fom	double	(number)	N (xxxx.x)	(calculated by THREAT)	Restruct QBE table	
	fom_force_level	double	(number)	N (xxxx.x)	(calculated by THREAT)	Restruct QBE table	
	plat_number	integer	5	SN (1-999)	**=plat2.plat_id**		
Table 12: emitter					(for plat2.tgt_cat = emitter):		
	system	text (30 char)	F-16 fighting Falco	A (40)	=platform.name	platforms & plat2	
	country	text (5 char)	USAF	A (8)	=platform.service		
	force_level	interg	200	N (0-99999)	(calculated)	**=platform.plat_adj_qty ??**	
	time_phase	double	(number)	N (0-100, x.xx)	=platform.fraction_present	platforms & plat2	
	effort_factor	double	(fraction<=1)	N (0-1, x.xxx)	**=plat2.role_effort_factor**		
	engagement-factor	double	(fraction<=1)	N (0-1, x.xxx)	**=plat2.engage_factor**		
	fom	double	16.7	N (1-999, x.x)	=plat2.plat_tgt_fom		
	tasc_category	text (5 char)	TCAIR	A (5)	=platform.tasc_group	platforms & plat2	
	plat_category	text (5 char)	air	A (5)	=structur.plat_cat	platforms.plat_class_id & structur.tgt_class_id	
	target_class	text (4 char)	EM	A (4)	=plat2.tgt_cat_ltrs		
	adj_force_level	double	(number)	N (xxxx.x)	(calculated by THREAT)	Restruct QBE table	
	adj_fom	double	(number)	N (xxxx.x)	(calculated by THREAT)	Restruct QBE table	
	fom_force_level	double	(number)	N (xxxx.x)	(calculated by THREAT)	Restruct QBE table	
	plat_number	integer	5	SN (1-999)	**=plat2.plat_id**		

THREAT/HLM TABLE CORRELATION

bold = source table key field
outline = scenario specific data

Tbl No.	THREAT Element	THREAT Format	THREAT Example	Delivered Format	HLMDB Element	Table Notes	Calculations Before Query
Table 13: tactical_missile					(for plat2.tgt_cat =msl):		
	system	text (30 char)	F-16 fighting Falco	A (40)	=platform.name	platforms & plat2	
	country	text (5 char)	USAF	A (8)	=platform.service		
	force_level	interg	200	N (0-99999)	(calculated)	**=platform.plat_adj_qty ??**	
	time_phase	double	(number)	N (0-100, x.xx)	=platform.fraction_present	platforms & plat2	
	effort_factor	double	(fraction<=1)	N (0-1, x.xxx)	**=plat2.role_effort_factor**		
	engagement-factor	double	(fraction<=1)	N (0-1, x.xxx)	**=plat2.engage_factor**		
	fom	double	16.7	N (1-999, x.x)	=plat2.plat_tgt_fom		
	tasc_category	text (5 char)	TCAIR	A (5)	=platform.tasc_group	platforms & plat2	
	plat_category	text (5 char)	air	A (5)	=structur.plat_cat	platforms.plat_class_id & structur.tgt_class_id	
	target_class	text (4 char)	TM	A (4)	=plat2.tgt_cat_ltrs		
	adj_force_level	double	(number)	N (xxxx.x)	(calculated by THREAT)	Restruct QBE table	
	adj_fom	double	(number)	N (xxxx.x)	(calculated by THREAT)	Restruct QBE table	
	fom_force_level	double	(number)	N (xxxx.x)	(calculated by THREAT)	Restruct QBE table	
	plat_number	integer	5	SN (1-999)	**=plat2.plat_id**		
Table 14: aircraft					(for plat2.tgt_cat = air):		
	system	text (30 char)	F-16 fighting Falco	A (40)	=platform.name	platforms & plat2	
	country	text (5 char)	USAF	A (8)	=platform.service		
	force_level	interg	200	N (0-99999)	(calculated)	**=platform.plat_adj_qty ??**	
	time_phase	double	(number)	N (0-100, x.xx)	=platform.fraction_present	platforms & plat2	
	effort_factor	double	(fraction<=1)	N (0-1, x.xxx)	**=plat2.role_effort_factor**		
	engagement-factor	double	(fraction<=1)	N (0-1, x.xxx)	**=plat2.engage_factor**		
	fom	double	16.7	N (1-999, x.x)	=plat2.plat_tgt_fom		
	tasc_category	text (5 char)	TCAIR	A (5)	=platform.tasc_group	platforms & plat2	
	plat_category	text (5 char)	air	A (5)	=structur.plat_cat	platforms.plat_class_id & structur.tgt_class_id	
	target_class	text (4 char)	AC	A (4)	=plat2.tgt_cat_ltrs		
	adj_force_level	double	(number)	N (xxxx.x)	(calculated by THREAT)	Restruct QBE table	
	adj_fom	double	(number)	N (xxxx.x)	(calculated by THREAT)	Restruct QBE table	
	fom_force_level	double	(number)	N (xxxx.x)	(calculated by THREAT)	Restruct QBE table	
	plat_number	integer	5	SN (1-999)	**=plat2.plat_id**		
Table 15: ship					(for plat2.tgt_cat = surf):		
	system	text (30 char)	F-16 fighting Falco	A (40)	=platform.name	platforms & plat2	
	country	text (5 char)	USAF	A (8)	=platform.service		
	force_level	interg	200	N (0-99999)	(calculated)	**=platform.plat_adj_qty ??**	
	time_phase	double	(number)	N (0-100, x.xx)	=platform.fraction_present	platforms & plat2	
	effort_factor	double	(fraction<=1)	N (0-1, x.xxx)	**=plat2.role_effort_factor**		
	engagement-factor	double	(fraction<=1)	N (0-1, x.xxx)	**=plat2.engage_factor**		
	fom	double	16.7	N (1-999, x.x)	=plat2.plat_tgt_fom		
	tasc_category	text (5 char)	TCAIR	A (5)	=platform.tasc_group	platforms & plat2	
	plat_category	text (5 char)	air	A (5)	=structur.plat_cat	platforms.plat_class_id & structur.tgt_class_id	
	target_class	text (4 char)	SHIP	A (4)	=plat2.tgt_cat_ltrs		
	adj_force_level	double	(number)	N (xxxx.x)	(calculated by THREAT)	Restruct QBE table	
	adj_fom	double	(number)	N (xxxx.x)	(calculated by THREAT)	Restruct QBE table	
	fom_force_level	double	(number)	N (xxxx.x)	(calculated by THREAT)	Restruct QBE table	
	plat_number	integer	5	SN (1-999)	**=plat2.plat_id**		

bold = source table key field
outline = scenario specific data

Tbl No.	THREAT Element	THREAT Format	THREAT Example	Delivered Format	HLMDB Element	Table Notes	Calculations Before Query
Table 16: submarine					(when plat2.tgt_cat = sub):		
	system	text (30 char)	F-16 fighting Falco	A (40)	=platform.name	platforms & plat2	
	country	text (5 char)	USAF	A (8)	=platform.service		
	force_level	interg	200	N (0-99999)	(calculated)	**=platform.plat_adj_qty ??**	
	time_phase	double	(number)	N (0-100, x.xx)	=platform.fraction_present	platforms & plat2	
	effort_factor	double	(fraction<=1)	N (0-1, x.xxx)	**=plat2.role_effort_factor**		
	engagement-factor	double	(fraction<=1)	N (0-1, x.xxx)	**=plat2.engage_factor**		
	fom	double	16.7	N (1-999, x.x)	=plat2.plat_tgt_fom		
	tasc_category	text (5 char)	TCAIR	A (5)	=platform.tasc_group	platforms & plat2	
	plat_category	text (5 char)	air	A (5)	=structur.plat_cat	platforms.plat_class_id & structur.tgt_class_id	
	target_class	text (4 char)	SUB	A (4)	=plat2.tgt_cat_ltrs		
	adj_force_level	double	(number)	N (xxxx.x)	(calculated by THREAT)	Restruct QBE table	
	adj_fom	double	(number)	N (xxxx.x)	(calculated by THREAT)	Restruct QBE table	
	fom_force_level	double	(number)	N (xxxx.x)	(calculated by THREAT)	Restruct QBE table	
	plat_number	integer	5	SN (1-999)	**=plat2.plat_id**		
Table 17: usaf_loadouts					(for platform.service = USAF):	platform & pmload1	
	plat_number	integer	5	SN (1-999)	**=pmload1.plat_id**		
	muntn_number	integer	8	SN (1-999)	**=pmload1.mun_id**		
	loadouts	double	6	SN (1-9999)	=pmload1.pm_load	but recalc'd by THREAT for A/C	
Table 18: army_loadouts					(for platform.service = USA):	platform & pmload1	
	plat_number	integer	43	SN (1-999)	**=pmload1.plat_id**		
	muntn_number	integer	26	SN (1-999)	**=pmload1.mun_id**		
	loadouts	double	8	SN (1-9999)	=pmload1.pm_load		
Table 19: navy_loadouts					(for platform.service = USN):	platform & pmload1	
	plat_number	integer	55	SN (1-999)	**=pmload1.plat_id**		
	muntn_number	integer	21	SN (1-999)	**=pmload1.mun_id**		
	loadouts	double	4	SN (1-9999)	=pmload1.pm_load	but recalc'd by THREAT for A/C	
Table 20: usmc_loadouts					(for platform.service = USMC):	platform & pmload1	
	plat_number	integer	37	SN (1-999)	**=pmload1.plat_id**		
	muntn_number	integer	30	SN (1-999)	**=pmload1.mun_id**		
	loadouts	double	2	SN (1-9999)	=pmload1.pm_load	but recalc'd by THREAT for A/C	

JMAP/HLM TABLE CORRELATION

12:02 PM, 1/5/95

bold = source table key field
outline = scenario specific data

Tbl Ltr	JMAP Element	JMAP Format	JMAP Example	Delivered Format	HLMDB Element	Table Notes	Calculations Before Query
A1							
	Study Title	text	MRC-E 01	A (30)	=scenario.scenario_name		scenarioflag =1 based on menu choice
A2							
	No_of_Intervals	integer	1	SN (1-9)	Direct input in JMAPMAIN		
	Interval1_Days	integer	60	SN (1-999)	Direct input in JMAPMAIN		
	Interval2_Days	integer	60	SN (1-999)	Direct input in JMAPMAIN		
	Interval3_Days	integer	60	SN (1-999)	Direct input in JMAPMAIN		
A3							
	Cost_Goal ($B)	xx.xx	5	N (xx.xx)	Direct input in JMAPMAIN		
A4							
	Cost_Priority	integer	1000	SN (1-9999)	Direct input in JMAPMAIN		
	Kill_Priority	integer	100	SN (1-999)	Direct input in JMAPMAIN		
	Attrit_Priority	integer	2	SN (1-999)	Direct input in JMAPMAIN		
A5							
	Number of platforms	integer	81	SN (1-999)	**=misc.qty_plat_types**		Σplatform.plat_id records
	Number of munitions	integer	153	SN (1-999)	**=misc.qty_mun_types**		Σmunition.mun_id records
	Number of targets	integer	129	SN (1-999)	**=misc.qty_tgt_types**		Σtargets.tgt_id records
B							
	Platform ID	integer	5	SN (1-999)	**=platform.plat_id**		
	Platform name	text	F-16 Fighting Fal	A (40)	=platform.name		
	Class	integer	5	SN (1-9)	=platform.plat_class_id		
	Cost ($M)	xxxx.xx	35	N (1-9999, x.xx)	=platform.cost / 1000		
	Quantity	integer	200	N (0-99999)	**=platform.quantity**		
	Max attrition (fraction)	x.xx	0.05	N (0-1, x.xxx)	**=platform.max_attrit**		
	Platform value	xxx.x	16.7	N (1-999, .x)	=platform.fom/mop		
	Service	text	USAF	A (8 char)	=platform.service		
C							
	Munition ID	integer	8	SN (1-999)	**=munition.mun_id**		
	Munition name	text	AGM-65G Maveric	A (40 char)	=munition.name		
	Cost	xxxx.x	120	N (1-9999, .x)	=munition.cost /1000		
	Quantity	integer	500	N (0-999999)	**=munition.quantity**		
	Doctrinal expenditure	integer	0	N (0-99999)	**=munition.doct_exp**		
	Service	text	USAF	A (5 char)	=munition.service		
D							
	Target Type	integer	1	SN (1-9)	**=tgtaloc2.tgt_class_id**		
	Name	text	MH	A (3 char)	=structur.class_ltrs	tgtaloc2 & structur	
	Fraction Allocated	x.xxx	0.26	N (0-1, x.xx)	**=tgtaloc2.us**		

JMAP/HLM TABLE CORRELATION

bold = source table key field
outline = scenario specific data

Tbl Ltr	JMAP Element	JMAP Format	JMAP Example	Delivered Format	HLMDB Element	Table Notes	Calculations Before Query
E							
	Target ID	integer	53	SN (1-999)	**=targets.tgt_id**		
	Target name	text	BMP-1/2 APC	A (40 char)	=targets.name		
	Class	integer	1	SN (1-9)	=targets.tgt_class_id		
	Quantity	integer	1800	N (0-99999)	**=targets.quantity**		
	Fraction to be killed L1	x.x	0.6	N (0-1, x.xx)	**=targets.destr_goal1**		
	Fraction to be killed L2	x.x	0	N (0-1, x.xx)	**=targets.destr_goal2**		
	Fraction to be killed L3	x.x	0	N (0-1, x.xx)	**=targets.destr_goal3**		
	Target value	xx.xx	2.2	N (1-999, .xx)	=targets.fom/mop		
F							
	Platform class	integer	5	SN (1-9)	**=tgtavail.plat_class_id**		
	Target class	integer	1	SN (1-9)	**=tgtavail.tgt_class_id**		
	Target avail in L1	x.xx	0.3	N (0-1, x.xx)	**=tgtavail.avail1**		
	Target avail in L2	x.xx	0	N (0-1, x.xx)	**=tgtavail.avail2**		
	Target avail in L3	x.xx	0	N (0-1, x.xx)	**=tgtavail.avail3**		
G							
	Compound target ID	integer	55 56 57	SN (1-999)	**=compound.tgt_id**		
	Sub target ID	integer	53 53 53	SN (1-999)	**=compound.sub_tgt_id**		
	Quantity	xx.x	1 4 5	N (1-999, xxx.x)	**=compound.quantity**		
H							
	Confidence level	x.xx	0.75	N (0.5-1.0, x.xx)	**=misc.conf_lvl**		
I							
	Fraction load lost by attrit	x.xx	0.5	N (0-1, x.xx)	**=misc.load_lost**		
J							
	Platform ID	integer	5	SN (1-999)	**=pmt.plat_id**		
	Munition ID	integer	8	SN (1-999)	**=pmt.mun_id**		
	Target ID	integer	53	SN (1-999)	**=pmt.tgt_id**		
	Attrition	x.xxx	0.003	N (0-1, x.xxx)	**=pmt.plat_attrit**		
	Rounds/Engagement	xxxx.x	2	N (1-9999, .x)	**=pmt.salvo_size**		
	RTK L1	xxxxx.x	3	N (1-999, .x)	**=pmt.rtk**		
	STDEV L1	xxxx.x	0	N (0-999, .xx)	**=pmt.stdev**		
	RTK L2	xxxxx.x	3			Restruct code to incl	
	STDEV L2	xxxx.x	0			Restruct code to incl	
	RTK L3	xxxxx.x	3			Restruct code to incl	
	STDEV L3	xxxx.x	0			Restruct code to incl	
K							
	Platform	integer	5	SN (1-999)	**=pmload1.plat_id**		
	Munition	integer	8	SN (1-999)	**=pmload1.mun_id**		
	Load-out	integer	2	SN (1-9999)	**=pmload1.pm_load**		
	Rate-of-fire/day	integer	10	SN (1-9999)	**=pmload1.max_rate**		pmt.salvo_size*pmt_tasc.salvos_per_encounter// tgt_class_tasc*plat1.engage_rate

TFA/HLM TABLE CORRELATION

bold = data table key field
outline = scenario specific data

Tbl Name	TFA Column	TFA Format	TFA Example	Delivered Format	HLMDB Element	Calculations and Table Notes
THREAT.XLS						
	A (target class)	text	MOBILE			Spreadsheet given value
	B (target category)	text	MODERN MBT			Spreadsheet given value
	C (target cat code)	text	MOB1			Spreadsheet given value
	D (average TASCFORM MOP)	number	4.00	N (1-999, x.xx)	(calculated)	wghted avg targets.fom/mop by tgt_cat_code
	E (target quantity)	integer	100	N (0-99999)	**tgt2.tgt_qty_aggr**	
	F (phase 1 tgt priority wght)	number	0.05	N (0-1, x.xx)	**tgt1.tgt_priority**	
	G (phase 2 tgt priority wght)	number	0.2	N (0-1, x.xx)	**tgt1.tgt_priority**	
	H (phase 3 tgt priority wght)	number	0.2	N (0-1, x.xx)	**tgt1.tgt_priority**	
	I (enemy force reconst rate)	number	0.05	N (0-1, x.xx)	**tgt2.tgt_reconst_rate**	
	J (tgt cat damage criterion)	number	1.00	N (0-1, x.xx)	(calculated)	wghted avg targets.destr_goal by tgt_cat_code
	K (Army grnd % distrib)	number	0.70	N (0-1, x.xx)	**tgtaloc1.army_ground**	-
	L (USAF air % distrib)	number	0.10	N (0-1, x.xx)	**tgtaloc1.usaf_air**	
	M (Navy air % distrib)	number	0.50	N (0-1, x.xx)	**tgtaloc1.navy_air**	
	N (navy surf/sub % distrib)	number	0.00	N (0-1, x.xx)	**tgtaloc1.navy_surfsub**	
	O (USMC air % distrib)	number	0.10	N (0-1, x.xx)	**tgtaloc1.usmc_air**	
	P (USMC grnd % distrib)	number	0.20	N (0-1, x.xx)	**tgtaloc1.usmc_grnd**	
	Q (total threat % distrib)	number	1.20			Spreadsheet calculated value
	R (empty)					
	S (total grnd % distrib)	number	0.90			Spreadsheet calculated value
	T (total air % distrib)	number	0.20			Spreadsheet calculated value
	U (total naval % distrib)	number	0.30			Spreadsheet calculated value
	V (empty)					
	W (total Army grnd forces tgts)	integer	90			Spreadsheet calculated value
	K (total USAF air forces tgts)	integer	230			Spreadsheet calculated value
	Y (total Navy air tgts)	integer	0			Spreadsheet calculated value
	Z (total Navy surf/sub tgts)	integer	0			Spreadsheet calculated value
	AA (total USMC air tgts)	integer	10			Spreadsheet calculated value
	AB (total USMC grnd tgts)	integer	20			Spreadsheet calculated value
	AC (empty)					
	AD (adj grnd forces tgts)	integer	90			Spreadsheet calculated value
	AE (adj air forces tgts)	integer	230			Spreadsheet calculated value
	AF (adj naval forces tgts)	integer	0			Spreadsheet calculated value

TFA/HLM TABLE CORRELATION

bold = data table key field
outline = scenario specific data

Tbl Name	TFA Column	TFA Format	TFA Example	Delivered Format	HLMDB Element	Calculations and Table Notes
X_PLAT.XLS (NUMBER OF ARRIVALS BY TYPE)						
	A (HLM id#)	integer	61			Spreadsheet given value
	B (TFA id#)	integer	1			Spreadsheet given value
	C (platform type)	text	B-52H			Spreadsheet given value
	D (service)	text	F			Spreadsheet given value
	E (empty)					
	F (arrival period -1 plat #)	integer	18		platarvl.plat_count	
	G (arrival period 0 plat #)	integer			platarvl.plat_count	
	H (arrival period 1 plat #)	integer	18		platarvl.plat_count	
	I (arrival period 2 plat #)	integer	18		platarvl.plat_count	
	J (arrival period 3 plat #)	integer			platarvl.plat_count	
	K (arrival period 5 plat #)	integer			platarvl.plat_count	
	L (arrival period 6 plat #)	integer	18		platarvl.plat_count	
	M (arrival period 7 plat #)	integer			platarvl.plat_count	
	N (arrival period 8 plat #)	integer			platarvl.plat_count	
	O (arrival period 9 plat #)	integer			platarvl.plat_count	
	P (arrival period 10 plat #)	integer			platarvl.plat_count	
	Q (arrival period 11 plat #)	integer			platarvl.plat_count	
	R (arrival period 12 plat #)	integer			platarvl.plat_count	
	S (arrival period 13 plat #)	integer			platarvl.plat_count	
	T (arrival period 14 plat #)	integer			platarvl.plat_count	
	U (arrival period15 plat #)	integer			platarvl.plat_count	
	V (arrival period 16 plat #)	integer			platarvl.plat_count	
	W (arrival period 17 plat #)	integer			platarvl.plat_count	
	X (arrival period 18 plat #)	integer			platarvl.plat_count	
	Y (arrival period19 plat #)	integer			platarvl.plat_count	
	Z (arrival period 20 plat #)	integer			platarvl.plat_count	
	AA (arrival period 21 plat #)	integer			platarvl.plat_count	
	AB (arrival period 22 plat #)	integer			platarvl.plat_count	
	AC (arrival period 23 plat #)	integer			platarvl.plat_count	
	AD (arrival period 24 plat #)	integer			platarvl.plat_count	
	AE (arrival period 25 plat #)	integer			platarvl.plat_count	
	AF (arrival period 26 plat #)	integer			platarvl.plat_count	
	AG (arrival period 27 plat #)	integer			platarvl.plat_count	
	AI (arrival period 28 plat #)	integer			platarvl.plat_count	
	AJ (arrival period 29 plat #)	integer			platarvl.plat_count	
	AK (arrival period 30 plat #)	integer			platarvl.plat_count	
	AL (total deployed)	integer	72			Spreadsheet calculated value
	AM (TASCFORM MOP)	number	4.00	N (1-999, x.xx)	platform.fom/mop	
	AN (platform type)	text	B-52H			Spreadsheet given value
	AO (phase 1 total % allocated)	number	1.00			Spreadsheet calculated value
	X1 (phase 1 plat msn vs tgt class % alloc)	number	0.20	N (0-1, x.xx)	plat1.alloc	
	(through)					
	X2 (phase 1 plat msn vs tgt class % alloc)	number	0.35	N (0-1, x.xx)	plat1.alloc	
	X3 (empty)					
	X4 (phase 2 total % allocated)					
	X5 (phase 2 plat msn vs tgt class % alloc)	number	0.15	N (0-1, x.xx)	plat1.alloc	
	(through)					
	X6 (phase 2 plat msn vs tgt class % alloc)	number	0.30	N (0-1, x.xx)	plat1.alloc	

TFA/HLM TABLE CORRELATION

bold = data table key field
outline = scenario specific data

Tbl Name	TFA Column	TFA Format	TFA Example	Delivered Format	HLMDB Element	Calculations and Table Notes
	X7 (empty)					
	X8 (phase 3 total % allocated)					
	X9 (phase 3 plat msn vs tgt class % alloc)	number	0.30	N (0-1, x.xx)	**plat1.alloc**	
	(through)					
	X10 (phase 3 plat msn vs tgt class % alloc)	number	0.10	N (0-1, x.xx)	**plat1.alloc**	
X_CAMP.XLS						
	A (HLM id#)	integer	61			Spreadsheet given value
	B (TFA id#)	integer	1			Spreadsheet given value
	C (platform type)	text	B-52H			Spreadsheet given value
	D (service)	text	F			Spreadsheet given value
	E (campaign period duration (days))	number	2.0	N (1-99, x.x)	**phasing.period_duration**	
	E (period number)	integer	-1			Spreadsheet given value
	E (campaign period ending day)	number	-1.0	N (1-999, x.x)		
	F (period number)	integer	0			Spreadsheet given value
	F (campaign period ending day)	number	1.0	N (1-999, x.x)		
	G (period number)	integer	1			Spreadsheet given value
	G (campaign period ending day)	number	3.0	N (1-999, x.x)		=period(X-1)+phasing.period_duration
	(through)					
	X0 (period number)	integer				Spreadsheet given value
	X0 (campaign period ending day)	number	61.0	N (1-999, x.x)		=period(X-1)+phasing.period_duration
	E (phase identifier)	text	Phase 1			Spreadsheet given value
	X1 (phase 1 plat msn vs tgt class engage rate)	number	0.20	N (0-1, x.xx)	**plat1.engage_rate**	
	(through)					
	X2 (phase 1 plat msn vs tgt class engage rate)	number	0.35	N (0-1, x.xx)	**plat1.engage_rate**	
	X3 (empty)					
	X4 (phase identifier)	text	Phase 2			Spreadsheet given value
	X5 (phase 2 plat msn vs tgt class engage rate)	number	0.15	N (0-1, x.xx)	**plat1.engage_rate**	
	(through)					
	X6 (phase 2 plat msn vs tgt class engage rate)	number	0.30	N (0-1, x.xx)	**plat1.engage_rate**	
	X7 (empty)					
	X8 (phase identifier)	text	Phase 3			Spreadsheet given value
	X9 (phase 3 plat msn vs tgt class engage rate)	number	0.30	N (0-1, x.xx)	**plat1.engage_rate**	
	(through)					
	X10 (phase 3 plat msn vs tgt class engage rate)	number	0.10	N (0-1, x.xx)	**plat1.engage_rate**	
	X11 (phase 1 platform attrition rate)	number	0.10	N (0-1, x.xx)	**plat3.attrition_rate**	
	X12 (phase 2 platform attrition rate)	number	0.05	N (0-1, x.xx)	**plat3.attrition_rate**	
	X13 (phase 3 platform attrition rate)	number	0.05	N (0-1, x.xx)	**plat3.attrition_rate**	
	X14 (plat availability rate)	number	0.85	N (0-1, x.xx)	**platform.avail_rate**	
	X15 (plat msn abort rate)	number	0.20	N (0-1, x.xx)	**platform.abort_rate**	
	X16 (plat mun lost w/abort)	number	0.30	N (0-1, x.xx)	**platform.abort_mun_lost**	
	X17 (plat mun lost w/attrition)	number	0.50	N (0-1, x.xx)	**platform.attrit_mun_lost**	
	X18 (plat reconstitution rate)	number	0.50	N (0-1, x.xx)	**platform.reconst_rate**	
	X19 (empty)					
	X20 (plat msn vs tgt class fals tgt rate)	number	0.15	N (0-1, x.xx)	**fals_tgt.false_tgt_rate**	
	(through)					
	X21 (plat msn vs tgt class fals tgt rate)	number	0.10	N (0-1, x.xx)	**fals_tgt.false_tgt_rate**	

TFA/HLM TABLE CORRELATION

bold = data table key field
outline = scenario specific data

Tbl Name	TFA Column	TFA Format	TFA Example	Delivered Format	HLMDB Element	Calculations and Table Notes
X_MUN.XLS						
	A (HLM Id#)	integer	200			Spreadsheet given value
	B (TFA id#)	integer	8			Spreadsheet given value
	C (munition type)	text	AGM-130 A/C			Spreadsheet given value
	D (service)	text	F			Spreadsheet given value
	E (unit of issue)	?	?			Not played at this time
	F (weight (#))	integer	3000			Not played at this time
	G (cube)	?	?			Not played at this time
	H (cost ($FY9X))				munition.cost	
	I (required residual)	number	0.05		munition.reqd_residual	
	J (daily wastage rate)	number	0		munition.mun_stock_lost	
	K (global inventory)					Not played at this time
	L (geographic inventory distribution)					Not played at this time
	M (geographic inventory distribution)					Not played at this time
	N (geographic inventory distribution)					Not played at this time
	O (geographic inventory distribution)					Not played at this time
	P (geographic inventory distribution)					Not played at this time
	Q (geographic inventory distribution)					Not played at this time
	R (geographic inventory distribution)					Not played at this time
	S (geographic inventory distribution)					Not played at this time
	T (available inventory)	integer	230	N (0-999999)	munition.quantity	
	U (adjusted combat inventory)	integer	230			Spreadsheet calculated value
X_PMT_X.XLS						
	A (TFA Id#)	integer	61			Spreadsheet given value
	B (platform type)	text	B-52H			Spreadsheet given value
	C (plat service)	text	F			Spreadsheet given value
	E (target class)	text	FIXED/T			Spreadsheet given value
	F (plat mission)	text	BOMBER			Spreadsheet given value
	A (TFA Id#)	integer	8			Spreadsheet given value
	B (munition type)	text	AGM-130 A/C			Spreadsheet given value
	C (mun service)	text	F			Spreadsheet given value
	D (mun priority weight)	number	0.20	N (0-1, x.xx)	pmt2.mun_priority	
	E (rounds/salvo)	number	1	SN (1-9999)	(calculated)	wghted avg pmt.salvo_size by tgt_class_name
	F (salvos/engagement)	integer	2	SN (1-99)	pmt2.salvos_per_engagement	
	G (platform load)	integer	8	SN (1-9999)	pmload2.pm_load2	
	H (plat/mun salvo Pk value, tgt_cat_code 1) (through)	number	1.23	N (0-999)	(calculated)	wghted avg pmt.salvo_pk by tgt_cat_code
	X (plat/mun salvo Pk value, tgt_cat_code X)	number	0.08	N (0-999)	(calculated)	wghted avg pmt.salvo_pk by tgt_cat_code

ATTACHMENT 3

DATABASE STRUCTURE, DATA REQUIREMENTS & DATA SOURCES

DATABASE STRUCTURE, DATA REQUIREMENTS AND DATA SOURCES

11:02 AM, 2/23/95

Tables/Columns	Sample Data	Format	Models			Data Sources (P=Primary)									Column Definitions and Comments
			TFA	JMAP	THREAT	Structure	Subjective Inputs	DPG/OYTR	DoD/Svc Doctrine	OSD/Svc DBS	Simulation Models	CINC Allocations	Misc Reports	Calculated	
platform															
plat_id	5	SN (1-999)	x	x	x	x									Platform index
plat_class_id	5	SN (1-9)		x		x									JMAP platform class index (1=MH, 2=MS, 5=AIR, 8=MAR SURF, 9=MAR SUB)
name	F-16 Fighting Falcon	A (40 char)		x	x	x				P				x	**Platform name = (calc designator + short name)**
desig	F-16	A (15 char)	x			x		P		P					Platform designator
sname	Fighting Falcon	A (25 char)				x				P					Platform short name
service	USAF	A (8 char)		x	x	x		P							Platform service (USA, USAF, USN, USMC, ALLIED A, ALLIED AF, ALLIED N)
cost	35000 ($K)	N (1-9999999, x.xx)		x	x					P					Platform unit cost in thousands of dollars ($ 000)
fom/mop	16.7	N (1-999, x.xx)	x	x			P								Platform figure-of-merit independent of role/target (from TASCFORM)
quantity	200	N (0-99999)		x	x			P	x		P			P	**Qty of plats of type/svc avail in scenario (calc 2.)**
fraction_present	0.3	N (0-1, x.xx)			x			P			x			P	**Fraction of time plats are present (calc 3.), D=0**
max_attrit	0.05	N (0-1, x.xxx)		x			x		P		x				Maximum limit on platform attrition (fraction) for the entire scenario, D=0.1
avail_rate	0.91	N (0-1, x.xx)	x							x	x				Percent of platform inventory available to begin sorties
abort_rate	0.2	N (0-1, x.xx)	x							x	x				Percent of platform sorties that are aborted
reconst_rate	0.5	N (0-1, x.xx)	x							x	x				Percent of attrited platforms reconstituted by repair or replacement
abort_mun_lost	0.3	N (0-1, x.xx)	x				x			x	x				Percent of munition load lost with platform sortie abort D=0 (A,AF), D=.8 (N)
attrit_mun_lost	0.5	N (0-1, x.xx)	x				x			x	x				Percent of munition load lost with platform sortie attrition D=0.3 (air), D=1.0 (grnd)
plat1															
plat_id	5	SN (1-999)	x	x	x	x									Platform index
phase	1	SN (1-9, <=3)	x			x			x		x				Campaign phase
tgt_class_name	FIXED/T	A (9 char)	x			x									TASC Target class
plat_msn	BAI	A (12 char)	x			x									Platform mission
campaign	air	A (4 char)	x					P	x	x	P				TASC campaign name
alloc	0.25	N (0-1, x.xx)	x				x		x	x	P				% plat inventory alloc'd to msn/tgt_class_tasc in phase (Σ=100 for plat/phase)
engage_rate	2	N (0-99, x.x)	x						x	x	P			x	Daily engagement rate by plat/mission/tgt class/phase combo
plat2															
plat_id	5	SN (1-999)	x	x	x	x									Platform index
tgt_cat_jirs	MHMS	A (4 char)			x	x									THREAT target category, abbreviated
plat_group	BAI	A (14 char)			x	x									Aggregated platform type (set equal to corresponding platform mission name)
plat_tgt_fom/mop	16.7	N (0-999, x.x)			x		P							P	**FOM for platform/target category combination (calc 4.)**
role_effort_factor	(fraction <=1)	N (0-1, x.xxx)			x			x		x	x	P		P	**Time fraction plat is dedicated to specified target category (calc 5.)**
engage_factor	(fraction <=1)	N (0-1, x.xxx)			x							P		P	Fraction to mult by fom to get adj-plat-score: plat ability to achieve contact w/tgt cat, D=1

DATABASE STRUCTURE, DATA REQUIREMENTS AND DATA SOURCES

11:02 AM, 2/23/95

Tables/Columns	Sample Data	Format	Models			Data Sources (P=Primary)									Column Definitions and Comments
			TFA	JMAP	THREAT	Structure	Subjective Inputs	DPG/OYTR	DoD/Svc Doctrine	OSD/Svc DBS	Simulation Models	CINC Allocations	Misc Reports	Calculated	
plat3															
plat_id	5	SN (1-999)	x	x	x	x									Platform index
phase	1	SN (1-3, <=3)	x			x			x		x				Campaign phase
attrition_rate	0.0005	N (0-1, x.xxxx)	x				x			x	P				% of plat inventory attrited in this phase (=pmt.plat_attrit*plat1.engage_rate/phase?)
platarvl															
plat_id	5	SN (1-999)	x	x	x	x									Platform index
period24hr	2	SN ((-1)-99, <=30)	x			x		x							Each 24 hr arrival period
plat_count	3	SN (0-999)	x											P	**No. of individual platforms that arrive in this campaign period (calc 1.)**
unitarvl															
unit_id	5	SN (1-999)				x		•							Combat unit index
period24hr	2	SN ((-1)-99, <=30)	x			x		x							Each 24 hr arrival period
unit_name	2 INF DIV	A (25)	x			x		P	x	x	P				Name of combat unit
unit_count	1	N (0-999, x.xxxx)	x					P	x	x	P				No. of combat units (not individual plats) that arrive in this campaign period (24 hours)
unitplat															
unit_id	5	SN (1-999)				x									Combat unit index
plat_id	2	SN ((-1)-99, <=30)	x	x	x	x		x							Platform index
unit_plat_qty	24	SN (0-999)				x		P	x	x	P				No. of individual platforms within this combat unit
fals_tgt															
plat_msn	BAI	A (12 char)	x			x									Platform mission
tgt_class_name	FIXED/T	A (9 char)	x			x									TASC target class
false_tgt_rate	0.2	N (0-1, x.xx)	x				x			x	x		x	P	False tgt rate as percent of real tgts for mission/tgt_class_tasc combo, D=0.10

DATABASE STRUCTURE, DATA REQUIREMENTS AND DATA SOURCES

Tables/Columns	Sample Data	Format	Models			Data Sources (P=Primary)									Column Definitions and Comments
			TFA	JMAP	THREAT	Structure	Subjective Inputs	DPG/OYTR	DoD/Svc Doctrine	OSD/Svc DBS	Simulation Models	CINC Allocations	Misc Reports	Calculated	
targets															
tgt_id	53	SN (1-999)		x	x	x									Target index
tgt_class_name	Mobile	A (9 char)	x			x							x		TASC target class
tgt_class_id	1	SN (1-9)		x	x	x									CMMP target class index (1=MH, 2=MS, 3=FH, . . .)
tgt_cat_name	AFV/SP Artillery	A (30 char)	x			x							x		TASC target category name
tgt_cat_code	mob3	A (4 char)	x			x							x		TASC target category code
name	BMP-1/2 APC	A (40 char)		x	x			P		x					Target name
fom/mop	2.2	N (1-999, .x)	x	x			P								Target figure-of-merit (from TASCFORM)
quantity	1800	N (0-99999)		x	x			P	x	x	x				**Tot qty tgts to enter scen (From tgt_inv.db for scenario)**
adj_qty	1352	N (0-99999)			x				x	x	x			P	**Tgt qty less the no. of tgts contained in other compound targets (calc 6.)**
destr_goal1	0.6	N (0-1, x.xx)		x			x	P	P			x			Fraction of targets to be killed (goal) in phase 1 (Σ(goal1+2+3)<=1)
destr_goal2	0 (not played)	N (0-1, x.xx)		x			x	P	P			x			Fraction of targets to be killed (goal) in phase 2 (Σ(goal1+2+3)<=1) (currently not played)
destr_goal3	0 (not played)	N (0-1, x.xx)		x			x	P	P			x			Fraction of targets to be killed (goal) in phase 3 (Σ(goal1+2+3)<=1) (currently not played)
tgt1															
tgt_cat_code	mob1	A (4 char)	x			x									TASC target category code
phase	1	SN (1-9, <=3)	x			x			x		x				Campaign phase
tgt_priority	0.05	N (0-1, x.xx)	x				x	x	P	x	x				% priority of attacking this tgt_cat in this phase (Σ=100 for a tgt_class_tasc))
tgt2															
tgt_cat_code	mob1	A (4 char)	x			x									TASC target category code
tgt_qty_aggr	10950	N (1-99999)	x											P	**Scenario target inventory (calc7.)**
tgt_reconst_rate	0.03	N (0-1, x.xx)	x				x		x	x	x		x		Percent target category reconstitution rate
tgtaloc1															
tgt_cat_code	mob1	A (4 char)	x			x									TASC target category code
usaf_air	0.1	N (0-1, x.xx)	x				x		x	x	x	P		P	**% tgt_cat_code allocated to USAF air forces normalized (calc 8a.)**
usaf_sof	0.05	N (0-1, x.xx)	x				x		x	x	x	P		P	**% tgt_cat_code allocated to USAF SOF forces normalized (calc 8b.)**
army_ground	0.3	N (0-1, x.xx)	x				x		x	x	x	P		P	**% tgt_cat_code allocated to USA ground forces normalized (calc 8c.)**
army_sof	0.05	N (0-1, x.xx)	x				x		x	x	x	P		P	**% tgt_cat_code allocated to USA SOF forces normalized (calc 8d.)**
navy_air	0.05	N (0-1, x.xx)	x				x		x	x	x	P		P	**% tgt_cat_code allocated to Navy air forces normalized (calc 8e.)**
navy_surfsub	0.05	N (0-1, x.xx)	x				x		x	x	x	P		P	**% tgt_cat_code allocated to Navy surf/sub forces normalized (calc 8f.)**
navy_sof	0.05	N (0-1, x.xx)	x				x		x	x	x	P		P	**% tgt_cat_code allocated to Navy sof forces normalized (calc 8g.)**
usmc_air	0.05	N (0-1, x.xx)	x				x		x	x	x	P		P	**% tgt_cat_code allocated to USMC Air normalized (calc 8h.)**
usmc_grnd	0.05	N (0-1, x.xx)	x				x		x	x	x	P		P	**% tgt_cat_code allocated to USMC Ground normalized (calc 8i.)**

DATABASE STRUCTURE, DATA REQUIREMENTS AND DATA SOURCES

Tables/Columns	Sample Data	Format	Models			Data Sources (P=Primary)									Column Definitions and Comments
			TFA	JMAP	THREAT	Structure	Subjective Inputs	DPG/OYTR	DoD/Svc Doctrine	OSD/Svc DBS	Simulation Models	CINC Allocations	Misc Reports	Calculated	
tgtaloc2															
tgt_class_id	1	SN (1-9)		x	x	x									Target class index
us	0.26	N (0-1, x.xx)		x			x	P	x	x	x	x		P	**Frac of tgt class alloc to U.S. forces (calc sum of allocs to U.S. services)**
usaf	(fraction)	N (0-1, x.xx)			x		x		x	x	x	x		P	**Frac of tgt class alloc to USAF (calc 9a.)**
usa	(fraction)	N (0-1, x.xx)			x		x		x	x	x	x		P	**Frac of tgt class alloc to USA (calc (9b.)**
usn	(fraction)	N (0-1, x.xx)			x		x		x	x	x	x		P	**Frac of tgt class alloc to USN (calc (9c.)**
usmc_air	(fraction)	N (0-1, x.xx)			x		x		x	x	x	x		P	**Fraction of specified target class allocated to USMC Air (calc (9d.)**
usmc_grnd	(fraction)	N (0-1, x.xx)			x		x		x	x	x	x		P	**Fraction of specified target class allocated to USMC Ground (calc (9e.)**
allied_air	(fraction)	N (0-1, x.xx)			x		x		x	x	x	x		P	**Fraction of specified target class allocated to Allied Air (calc (9f.)**
allied_army	(fraction)	N (0-1, x.xx)			x		x		x	x	x	x		P	**Fraction of specified target class allocated to Allied Army (calc (9g.)**
allied_navy	(fraction)	N (0-1, x.xx)			x		x		x	x	x	x		P	**Fraction of specified target class allocated to Allied Navy (calc (9h.)**
false_fract	0.1	N (0-1, x.xx)			x?		x		x	x	x		P	x	False tgts as fract of real tgts tasked to ea pm pair (?=0.1 hardwired in THREAT code)
compound															
tgt_id	32	SN (1-999)		x		x									Target index number of a compound target
sub_tgt_id	56 57 58	SN (1-999)		x		x									Target index number of a sub-target contained within the compound target
quantity	.5 2 .5	N (1-999, xxx.x)		x			x	x	x	x	x		x	P	Quantity of sub-target within compound target
tgtavail															
plat_class_id	5	SN (1-9)		x		x									JMAP platform class index
tgt_class_id	1	SN (1-9)		x		x									Target class index
avail1	0.3	N (0-1, x.xx)		x					x	x	P			P	Fraction of targets engageable by the specified platform in phase 1, D=1.0
avail2	0 (not played)	N (0-1, x.xx)		x					x	x	P			P	Fraction of targets engageable by the specified platform in phase 2, D=1.0 (not played)
avail3	0 (not played)	N (0-1, x.xx)		x					x	x	P			P	Fraction of targets engageable by the specified platform in phase 3, D=1.0 (not played)
tgt_inv															
tgt_id	53	SN (1-999)		x	x	x									Target index
tgt_qty	1800	N (0-99999)		x	x			P	x	x	x				Tot qty tgts to enter scenario inflated by svc overlap
usaf_alloc	0.2	N (0-1, x.xx)	x	x		x									% tgt_id allocated to USAF air forces normalized
usa_alloc	0.2	N (0-1, x.xx)	x	x		x									% tgt_id allocated to USA ground forces normalized
usn_air_alloc	0.2	N (0-1, x.xx)	x			x									% tgt_id allocated to Navy air forces normalized
usn_surfsub_alloc	0.2	N (0-1, x.xx)	x			x									% tgt_id allocated to Navy surf/sub forces normalized
usmc_air_alloc	0.2	N (0-1, x.xx)	x	x		x									% tgt_id allocated to USMC Air normalized
usmc_grnd_alloc	0.2	N (0-1, x.xx)	x	x		x									% tgt_id allocated to USMC Ground normalized
allied_usaf_alloc	(fraction)	N (0-1, x.xx)			x		x		x	x	x	x		P	% tgt_id allocated to Allied Air
allied_army_alloc	(fraction)	N (0-1, x.xx)			x		x		x	x	x	x		P	% tgt_id allocated to Allied Army
allied_navy_alloc	(fraction)	N (0-1, x.xx)			x		x		x	x	x	x		P	% tgt_id allocated to Allied Navy

DATABASE STRUCTURE, DATA REQUIREMENTS AND DATA SOURCES

Tables/Columns	Sample Data	Format	Models			Data Sources (P=Primary)										Column Definitions and Comments
			TFA	JMAP	THREAT	Structure	Subjective Inputs	DPG/OYTR	DoD/Svc Doctrine	OSD/Svc DBS	Simulation Models	CINC Allocations	Misc Reports	Calculated		
munition																
mun_id	8	SN (1-999)	x	x	x	x										Munition index
name	AGM-65G Maverick	A (40 char)	x	x	x					P						Munition
service	USAF	A (5 char)	x	x	x					P			P			Munition service
cost	120000	N (1-9999999, .x)	x	x	x					P						Munition unit cost in dollars ($)
quantity	500	N (0-999999)	x	x	x						x		P			**Scenario munitions inventory (from mun_inv.db for scenario)**
doct_exp	0	N (0-99999)		x			x		P	x	x					Minimum doctrinal expenditures for the specified munition for the scenario, D=0
mun_stock_lost	0.0002	N (0-1, x.xxxx)	x				x			x	x		x			Percent of mun stocks lost daily due to enemy action or accidents, D=0
reqd_residual	0.005	N (0-1, x.xxxx)	x						P							Percent of CINC mun inventory required as residual, D=0
pmload1																
plat_id	5	SN (1-999)	x	x	x	x										Platform index
mun_id	8	SN (1-999)	x	x	x	x										Munition index
max_rate	10	SN (1-9999)		x			x		P	P	x		x	P		**Max no. of rounds (upper limit) that can be fired by this plat/day (calc 10.)**
pm_load	2	SN (1-9999)		x	x				x	P	x		x	P		Avg (std?) mun load-out for pm combo (JMAP for all, THREAT for non-A/C plats)
pmload2																
plat_id	5	SN (1-999)	x			x										Platform index
mun_id	8	SN (1-999)	x			x										Munition index
plat_msn	BAI	A (12 char)	x			x										Platform mission
pm_load2	10	SN (1-9999)	x				x		P	P	x		x			Max homogeneous munitions load on platform during specific mission
pmt																
plat_id	5	SN (1-999)	x	x	x	x										Platform index
mun_id	8	SN (1-999)	x	x	x	x										Munition index
tgt_id	53	SN (1-999)		x	x	x										Target index
sspk	0.33	N (0-1, x.xxxxxx)				x				P	P		P			Single shot probability of kill for pmt combination (NOT USED IN ANY MODEL)
rtk_stdev	0	N (0-999, .xx)		x	x					x			P	x		Standard deviation for RTK, D=0.0
salvo_size	2	N (1-9999)	x	x	x				P	P	x		x			Number of rounds in one salvo fired in one platform-target engagement
rtk	3	N (1-999, .x)		x	x					x	x		x	P		Mean no. of rnds req'd to kill tgt (=1/sspk)
salvo_pk	0.75	N (0-1, x.xxx)	x						P	P	x		x	x		Salvo PK (calc from sspk and salvo_size based on geometric distrib)
load	(integer)	N (1-9999)			x		x		P	P	x		x			Mun loadout on A/C plat for role against specified target (A/C only)
plat_attrit	0.003	N (0-1, x.xxx)		x	x					P	P			x		Platform attrition (fraction) per pmt engagement

DATABASE STRUCTURE, DATA REQUIREMENTS AND DATA SOURCES

Tables/Columns	Sample Data	Format	Models			Data Sources (P=Primary)										Column Definitions and Comments
			TFA	JMAP	THREAT	Structure	Subjective Inputs	DPG/OYTR	DoD/Svc Doctrine	OSD/Svc DBS	Simulation Models	CINC Allocations	Misc Reports	Calculated		
pmt2																
plat_id	5	SN (1-999)	x	x	x	x										Platform index
mun_id	8	SN (1-999)	x	x	x	x										Munition index
tgt_class_name	mobile	A (9 char)	x	x		x										TASC target class
salvos_per_engagement	2	SN (1-99)	x				x		P	P	x					Number of standard salvos used per tgt_class_tasc engagement
mun_priority	0.25	N (0-1, x.xx)	x				x		x	x	x		x			% mun priority weight on specified platform against tgt_class_tasc

DATABASE STRUCTURE, DATA REQUIREMENTS AND DATA SOURCES

11:02 AM, 2/23/95

Tables/Columns	Sample Data	Format	Models			Data Sources (P=Primary)									Column Definitions and Comments
			TFA	JMAP	THREAT	Structure	Subjective Inputs	DPG/OYTR	DoD/Svc Doctrine	OSD/Svc DBS	Simulation Models	CINC Allocations	Misc Reports	Calculated	
phasing															
campaign	Air	A (5 char)	x			x									TASC campaign
period	-1	SN ((-1)-99, <=30)	x			x									TASC campaign period number (D-/+)(-1>=, 30<=)
phase	1	SN (1-9, <=3)	x					x	x		x				TASC campaign phase (1, 2, or 3)
period_duration	1	N (0-99, .x)	x					x			x				Campaign period duration in days
misc															
conf_lvl	0.75	N (0.05-1.00, x.xx)		x			P								Stat conf lvl (0.50 to 0.95) assoc'd w/achieving a goal based on variable RTK, D=.9
load_lost	0.5	N (0-1, x.xx)		x			x		x	x	x		x	x	**Fraction of munition load lost when any platform is attrited (calc12.)**
qty_plat_types	81	SN (1-999)		x										P	**Total number of different platform types (calc 11a.)**
qty_mun_types	153	SN (1-999)		x										P	**Total number of different munition types (calc 11b.)**
qty_tgt_types	129	SN (1-999)		x										P	**Total number of different target types (calc 11c.)**
structur															
tgt_class_id	1	SN (1-9)		x	x	x							x		CMMP target class index (1=MH, 2=MS, 3=FH, . . .)
tgt_class_ltrs	MH	A (4 char)		x	x	x							x		Class, abbreviated (...SHIP, SUB)
tgt_class_name	Mobile	A (9 char)	x			x							x		TASC target class
tgt_cat_ltrs	MHMS	A (4 char)			x	x							x		THREAT target category, abbreviated
plat_cat	grnd	A (5 char)			x	x							x		THREAT platform category
threat_table	mobile_hard_soft	A (20 char)			x	x									THREAT figure-of-merit table reference call-out
scenario															
scenario_name	MRC-E 01	A (20)				x									Scenario name
scenario_code	mrce01	A (8)				x									Scenario code (=subdirectory name)
scenarioflag	1	S (0,1)				x									Scenario flag to ID active scenario

ATTACHMENT 4

HLMDB JMAP DOWNLOADER SCRIPT

```
ge 1:  JMAPMAIN::#Script1::run*


:hod run(var eventInfo Event)
:
 fs                                              FileSystem
 tbla1, tbla2, tbla3, tbla4, tbla5              Table
 tblb, tblc, tble,  tblf, tblg                   Table
 tblj, tblk                                     Table
 tbla1TC, tbla2TC, tbla3TC, tbla4TC, tbla5TCTCursor
 tblbTC, tblcTC, tbleTC, tblfTC, tblgTC          TCursor
 tbljTC, tblkTC                                  TCursor
 compoundTC, platformTC, munitionTC             TCursor
 targetsTC, tgtavailTC, miscTC                   TCursor
 pmtTC, pmloadTC, scenarioTC                   TCursor
 platformid, munitionid, targetid                SmallInt
 tgtidA, tgtidB, subtgtid                       SmallInt
 sourceDir, scenarioname, scenariocode          String
 tbldQ                                           String    ;to use query string method
 tblh, tbli                                     Query      ;to use query statement method
lVar
)en TCursors
pundTC.open(":HLMdbs:compound.db")
itformTC.open(":HLMdbs:platform.db")
iitionTC.open(":HLMdbs:munition.db")
:getsTC.open(":HLMdbs:targets.db")
:availTC.open(":HLMdbs:tgtavail.db")
icTC.open(":HLMdbs:misc.db")
:TC.open(":HLMdbs:pmt.db")
.oadTC.open(":HLMdbs:pmload1.db")
:narioTC.open(":HLMdbs:scenario.db")
/*******************
:lete any previous scenario files from JMAP subdirectory
 fs.findfirst(":JMAP:*.*") then
 fs.setDir(":JMAP:")
 fs.delete(fs.name())
 while fs.findNext()
    fs.delete(fs.name())
 endWhile
lIf
*******************
) the current scenario to produce the Study Title and id scenario_code text
in scenarioTC for scenarioTC."scenarioflag"=1:
 scenarioname=scenarioTC."scenario_name"
 scenariocode=scenarioTC."scenario_code"
lScan
ioreCaseInStringCompares(yes)                ;do not consider case when comparing strings
 *******************
·eate table a1 to save the study title. The title given will be equal to the scenario name.
.a1 = create ":JMAP:TBL_A1.DB"
    with   "Study_Title"        :  "A40"
lCreate
.a1TC.open(tbla1)
 a1TC.edit()
 a1TC.insertRecord()
 tbla1TC."Study_Title" = scenarioname          ;the scenario name is inserted as the study title
.a1TC.postRecord()
 a1TC.endEdit()
 a1TC.close()
 a1.unattach()
 *******************
·eate table a2 to save the model intervals
IIS CODE MUST BE MODIFIED IF THE DEFAULT INTERVALS/INTERVAL DAYS MUST BE CHANGED FROM 1 & 60 !!!
 a2 = create ":JMAP:TBL_A2.DB"
    with   "No_of_Intervals"        :  "S",
           "Interval1_Days"         :  "S",
           "Interval2_Days"         :  "S",
           "Interval3_Days"         :  "S"
lCreate
 a2TC.open(tbla2)
 a2TC.edit()
 a2TC.insertRecord()
 tbla2TC."No_of_Intervals" = 1            ;CHANGE DEFAULT NUMBER OF INTERVALS HERE !!!
 tbla2TC."Interval1_Days" = 60            ;CHANGE DEFAULT NUMBER OF INTERVAL1 DAYS HERE !!!
 tbla2TC."Interval2_Days" = 0             ;CHANGE DEFAULT NUMBER OF INTERVAL2 DAYS HERE !!!
 tbla2TC."Interval3_Days" = 0             ;CHANGE DEFAULT NUMBER OF INTERVAL3 DAYS HERE !!!
 a2TC.postRecord()
 a2TC.endEdit()
 a2TC.close()
 a2.unattach()
 *******************
 eate table a3 to save the cost goal value in $B
:IS CODE MUST BE MODIFIED IF THE DEFAULT COST GOAL NEEDS TO BE CHANGED FROM $5B !!!
 a3 = create ":JMAP:TBL_A3.DB"
    with   "Cost_Goal"       :  "N"
.Create
 a3TC.open(tbla3)
 a3TC.edit()
```

```
.a3TC.insertRecord()
 tbla3TC."Cost_Goal" = 5                ;CHANGE DEFAULT COST GOAL HERE !!!
.a3TC.postRecord()
.a3TC.endEdit()
.a3TC.close()
.a3.unattach()
'*******************
'eate table a4 to save the cost, kill and attrit goal priorities
!IS CODE MUST BE MODIFIED IF THE DEFAULT! PRIORITIES MUST BE CHANGED !!!
.a4 = create ":JMAP:TBL_A4.DB"
    with   "Cost_Priority"      :  "S",
          "Kill_Priority"      :  "S",
          "Attrit_Priority"        :  "S"
!Create
.a4TC.open(tbla4)
.a4TC.edit()
.a4TC.insertRecord()
 tbla4TC."Cost_Priority" = 500            ;CHANGE DEFAULT COST PRIORITY HERE !!!
 tbla4TC."Kill_Priority" = 100            ;CHANGE DEFAULT KILL PRIORITY HERE !!!
 tbla4TC."Attrit_Priority" = 10       ;CHANGE PLAT ATTRIT PRIORITY HERE !!!
.a4TC.postRecord()
.a4TC.endEdit()
 a4TC.close()
.a4.unattach()
 *******************
 a5 = create ":JMAP:TBL_A5.DB"
    with   "Number of Platforms"        :  "S",
          "Number of Munitions"        :  "S",
          "Number of Targets"          :  "S"
!Create
.a5TC.open(tbla5)
 a5TC.edit()
 a5TC.insertRecord()
 tbla5TC."Number of Platforms" = miscTC."qty_plat_types"
 tbla5TC."Number of Munitions" = miscTC."qty_mun_types"
 tbla5TC."Number of Targets" = miscTC."qty_tgt_types"
 a5TC.postRecord()
 a5TC.endEdit()
 a5TC.close()
 a5.unattach()
 *******************
 b = create ":JMAP:TBL_B.DB"
    with   "Platform ID"                :  "S",
          "Platform Name"             :  "A40",
          "Class"                      :  "S",
          "Cost"                       :  "N",
          "Quantity"                    :  "N",
          "Max Attrition"             :  "N",
          "Platform Value"                :  "N",
          "Service"                     :  "A8"
    key"Platform ID"
.Create
 bTC.open(tblb)
 bTC.edit()
.n platformTC for platformTC."quantity">0 :
 if platformTC.recNo()>1 then
    tblbTC.insertAfterRecord()
    tblbTC."Platform ID"=platformTC."plat_id"
    tblbTC."Platform Name"=platformTC."name"
    tblbTC."Class"=platformTC."plat_class_id"
    tblbTC."Cost"=platformTC."cost"/1000
    tblbTC."Quantity"=platformTC."quantity"
    tblbTC."Max Attrition"=platformTC.(scenariocode+"max_attrit")
    tblbTC."Platform Value"=platformTC."fom/mop"
    tblbTC."Service"=platformTC."service"
 else
    tblbTC.insertRecord()
    tblbTC."Platform ID"=platformTC."plat_id"
    tblbTC."Platform Name"=platformTC."name"
    tblbTC."Class"=platformTC."plat_class_id"
    tblbTC."Cost"=platformTC."cost"/1000
    tblbTC."Quantity"=platformTC."quantity"
    tblbTC."Max Attrition"=platformTC.(scenariocode+"max_attrit")
    tblbTC."Platform Value"=platformTC."fom/mop"
    tblbTC."Service"=platformTC."service"
 endIf
!Scan
 bTC.postRecord()
 bTC.endEdit()
 bTC.close()
 b.unattach()
 *******************
 c = create ":JMAP:TBL_C.DB"
    with   "Munition ID"                :  "S",
          "Munition name"          :  "A40",
```

```
        "Cost"                    :  "N",
        "Quantity"                :  "N",
        "Doctrinal expenditure"   :  "N",
        "Service"                 :  "A5"
   key"Munition ID"
lCreate
.cTC.open(tblc)
.cTC.edit()
in munitionTC for munitionTC."quantity">0 :
 if munitionTC.recNo()>1 then
    tblcTC.insertAfterRecord()
    tblcTC."Munition ID"=munitionTC."mun_id"
    tblcTC."Munition name"=munitionTC."name"
    tblcTC."Cost"=munitionTC."cost"
    tblcTC."Quantity"=munitionTC."quantity"
    tblcTC."Doctrinal expenditure"=munitionTC.(scenariocode+"doct_exp")
    tblcTC."Service"=munitionTC."service"
 else
    tblcTC.insertRecord()
    tblcTC."Munition ID"=munitionTC."mun_id"
    tblcTC."Munition name"=munitionTC."name"
    tblcTC."Cost"=munitionTC."cost"
    tblcTC."Quantity"=munitionTC."quantity"
    tblcTC."Doctrinal expenditure"=munitionTC.(scenariocode+"doct_exp")
    tblcTC."Service"=munitionTC."service"
 endIf
lScan
.cTC.postRecord()
.cTC.endEdit()
.cTC.close()
.c.unattach()
'*******************
ie the query string method to generate a query-based table
.dQ="Query

LMDBS:TGTALOC2.DB | Tgt_class_id                          |
                  | Check _tgtclassid, AS Target Type |"+"

LMDBS:STRUCTUR.DB | tgt_class_ltrs | tgt_class_id |
                  | Check AS Name  | _tgtclassid  |"+"

LMDBS:TGTALOC2.DB | US                              |
                  | Check AS Fraction Allocated |

lQuery"
cuteQBEstring(tbldQ, ":JMAP:TBL_D.DB")
 ********************
 e = create ":JMAP:TBL_E.DB"
    with   "Target ID"                :  "S",
           "Target name"              :  "A40",
           "Class"                    :  "S",
           "Quantity"                 :  "N",
           "Fraction to be killed L1" :  "N",      ;L2 & L3 FRACTIONS MAY BE REQ'D LATER
           "Target value"             :  "N"
    key"Target ID"
.Create
 eTC.open(tble)
 eTC.edit()
 n targetsTC for targetsTC."quantity">0 :
 if targetsTC.recNo()>1 then
    tbleTC.insertAfterRecord()
    tbleTC."Target ID"=targetsTC."tgt_id"
    tbleTC."Target name"=targetsTC."name"
    tbleTC."Class"=targetsTC."tgt_class_id"
    tbleTC."Quantity"=targetsTC."quantity"
    tbleTC."Fraction to be killed L1"=targetsTC.(scenariocode+"destr_goal1");L2 & L3 FRACTIONS MAY BE REQ'D L
    tbleTC."Target value"=targetsTC."fom/mop"
 else
    tbleTC.insertRecord()
    tbleTC."Target ID"=targetsTC."tgt_id"
    tbleTC."Target name"=targetsTC."name"
    tbleTC."Class"=targetsTC."tgt_class_id"
    tbleTC."Quantity"=targetsTC."quantity"
    tbleTC."Fraction to be killed L1"=targetsTC.(scenariocode+"destr_goal1");L2 & L3 FRACTIONS MAY BE REQ'D L
    tbleTC."Target value"=targetsTC."fom/mop"
 endIf
 Scan
 eTC.postRecord()
 eTC.endEdit()
 eTC.close()
 e.unattach()
 ********************
 f = create ":JMAP:TBL_F.DB"
    with   "Platform class"           :  "S",
           "Target class"             :  "S",
```

```
e 4:  JMAPMAIN::#Script1::run*


        "Target avail in L1"          :  "N",
        "Target avail in L2"          :  "N",
        "Target avail in L3"          :  "N"
   key"Platform class"
   key"Target class"
Create
fTC.open(tblf)
fTC.edit()
n tgtavailTC:
if tgtavailTC.recNo()>1 then
   tblfTC.insertAfterRecord()
   tblfTC."Platform class"=tgtavailTC."plat_class_id"
   tblfTC."Target class"=tgtavailTC."tgt_class_id"
   tblfTC."Target avail in L1"=tgtavailTC.(scenariocode+"avail1")
   tblfTC."Target avail in L2"=tgtavailTC.(scenariocode+"avail2")
   tblfTC."Target avail in L3"=tgtavailTC.(scenariocode+"avail3")
else
   tblfTC.insertRecord()
   tblfTC."Platform class"=tgtavailTC."plat_class_id"
   tblfTC."Target class"=tgtavailTC."tgt_class_id"
   tblfTC."Target avail in L1"=tgtavailTC.(scenariocode+"avail1")
   tblfTC."Target avail in L2"=tgtavailTC.(scenariocode+"avail2")
   tblfTC."Target avail in L3"=tgtavailTC.(scenariocode+"avail3")
endIf
Scan
fTC.postRecord()
fTC.endEdit()
fTC.close()
f.unattach()
********************
g = create ":JMAP:TBL_G.DB"
   with   "endfield"        :  "A30",
          "tgt_ids"         :  "S",
          "subtgt_count"    :  "N"
Create
gTC.open(tblg)
gTC.edit()
idA=0
n compoundTC:
tgtidB=compoundTC."tgt_id"
if compoundTC.recNo()=1 then
   tblgTC.insertRecord()
   tblgTC."tgt_ids"=compoundTC."tgt_id"
   tgtidA=tgtidB
endIf
if tgtidB=tgtidA then
   tblgTC.insertAfterRecord()
   tblgTC."tgt_ids"=compoundTC."sub_tgt_id"
   tblgTC."subtgt_count"=compoundTC.(scenariocode+"quantity")
else
   tblgTC.insertAfterRecord()
   tblgTC."endfield"="END"
   tblgTC.insertAfterRecord()
   tblgTC."tgt_ids"=compoundTC."tgt_id"
   tblgTC.insertAfterRecord()
   tblgTC."tgt_ids"=compoundTC."sub_tgt_id"
   tblgTC."subtgt_count"=compoundTC.(scenariocode+"quantity")
   tgtidA=tgtidB
endIf
Scan
gTC.insertAfterRecord()
gTC."endfield"="END COMPOUND"
gTC.postRecord()
gTC.endEdit()
gTC.close()
g.unattach()
********************
e the query statement method to generate a query-based table
h=Query

LMDBS:MISC.DB | Conf_lvl                    |
              | Check AS Confidence level  |

Query
cuteQBE(tblh, ":JMAP:TBL_H.DB")
********************
e the query statement method to generate a query-based table
i=Query

LMDBS:MISC.DB | Load_lost                                  |
              | Check AS Fraction load lost by attrit     |

Query
cuteQBE(tbli, ":JMAP:TBL_I.DB")
********************
```

```
ge 5:  JMAPMAIN::#Script1::run*


lj = create ":JMAP:TBL_J.DB"
    with   "Platform ID"              :  "S",
           "Munition ID"              :  "S",
           "Target ID"                :  "S",
           "Attrition"                :  "N",
           "Rounds/Engagement"        :  "N",
           "RTK L1"                   :  "N",
           "STDEV L1"                 :  "N",
           "RTK L2"                   :  "N",
           "STDEV L2"                 :  "N",
           "RTK L3"                   :  "N",
           "STDEV L3"                 :  "N"
    key"Platform ID"
    key"Munition ID"
    key"Target ID"
lCreate
ljTC.open(tblj)
ljTC.edit()
in pmtTC :
 platformid=pmtTC."plat_id"
 munitionid=pmtTC."mun_id"
 targetid=pmtTC."tgt_id"
 scan platformTC for platformTC."plat_id"=platformid AND platformTC."quantity">0 :
    scan munitionTC for munitionTC."mun_id"=munitionid AND munitionTC."quantity">0 :
       scan targetsTC for targetsTC."tgt_id"=targetid AND targetsTC."quantity">0 :
          if pmtTC.recNo()>1 then
             tbljTC.insertAfterRecord()
             tbljTC."Platform ID"=pmtTC."plat_id"
             tbljTC."Munition ID"=pmtTC."mun_id"
             tbljTC."Target ID"=pmtTC."tgt_id"
             tbljTC."Attrition"=pmtTC.(scenariocode+"plat_attrit")
             tbljTC."Rounds/Engagement"=pmtTC."salvo_size"
             tbljTC."RTK L1"=pmtTC.(scenariocode+"rtk")
             tbljTC."STDEV L1"=pmtTC."rtk_stdev"
             tbljTC."RTK L2"=""                          ;L2 & L3 FRACTIONS MAY BE REQ'D LATER
             tbljTC."STDEV L2"=""                            ;L2 & L3 FRACTIONS MAY BE REQ'D LATER
             tbljTC."RTK L3"=""                          ;L2 & L3 FRACTIONS MAY BE REQ'D LATER
             tbljTC."STDEV L3"=""                            ;L2 & L3 FRACTIONS MAY BE REQ'D LATER
          else
             tbljTC.insertRecord()
             tbljTC."Platform ID"=pmtTC."plat_id"
             tbljTC."Munition ID"=pmtTC."mun_id"
             tbljTC."Target ID"=pmtTC."tgt_id"
             tbljTC."Attrition"=pmtTC.(scenariocode+"plat_attrit")
             tbljTC."Rounds/Engagement"=pmtTC."salvo_size"
             tbljTC."RTK L1"=pmtTC.(scenariocode+"rtk")
             tbljTC."STDEV L1"=pmtTC."rtk_stdev"
             tbljTC."RTK L2"=""                          ;L2 & L3 FRACTIONS MAY BE REQ'D LATER
             tbljTC."STDEV L2"=""                            ;L2 & L3 FRACTIONS MAY BE REQ'D LATER
             tbljTC."RTK L3"=""                          ;L2 & L3 FRACTIONS MAY BE REQ'D LATER
             tbljTC."STDEV L3"=""                            ;L2 & L3 FRACTIONS MAY BE REQ'D LATER
          endIf
          quitLoop                                ;if tgt_id & tgt quantity>0 was found, quit Scan
       endScan                                  ;end targetsTC Scan for tgt_id & tgt quantity>0
       quitLoop                                  ;if mun_id & mun quantity>0 was found, quit Scan
    endScan                                    ;end munitionTC Scan for mun_id & mun quantity>0
 quitLoop                                       ;if plat_id & plat quantity>0 was found, quit Loop
 endScan                                     ;end platformTC Scan for plat_id & plat quantity>0
lScan                                      ;end pmtTC Scan for each pmt combo
.jTC.postRecord()
.jTC.endEdit()
.jTC.close()
.j.unattach()
'*******************
.k = create ":JMAP:TBL_K.DB"
    with   "Platform ID"           :  "S",
           "Munition ID"           :  "S",
           "Load-out"              :  "S",
           "Rate-of-fire/day"      :  "S"
    key"Platform ID"
    key"Munition ID"
lCreate
.kTC.open(tblk)
.kTC.edit()
in pmloadTC :
 platformid=pmloadTC."plat_id"
 munitionid=pmloadTC."mun_id"
 scan platformTC for platformTC."plat_id"=platformid AND platformTC."quantity">0 :
    scan munitionTC for munitionTC."mun_id"=munitionid AND munitionTC."quantity">0 :
       if pmloadTC.recNo()>1 then
          tblkTC.insertAfterRecord()
          tblkTC."Platform ID"=pmloadTC."plat_id"
          tblkTC."Munition ID"=pmloadTC."mun_id"
          tblkTC."Load-out"=pmloadTC.(scenariocode+"pm_load")
          tblkTC."Rate-of-fire/day"=pmloadTC."max_rate"
```

```
      else
         tblkTC.insertRecord()
         tblkTC."Platform ID"=pmloadTC."plat_id"
         tblkTC."Munition ID"=pmloadTC."mun_id"
         tblkTC."Load-out"=pmloadTC.(scenariocode+"pm_load")
         tblkTC."Rate-of-fire/day"=pmloadTC."max_rate"
      endIf
      quitLoop                                   ;if mun_id & mun quantity>0 was found, quit Scan
   endScan                                    ;end munitionTC Scan for mun_id & mun quantity>0
   quitLoop                                      ;if plat_id & plat quantity>0 was found, quit Loop
endScan                                    ;end platformTC Scan for plat_id & plat quantity>0
lScan                                     ;end pmloadTC Scan for each pm pair
.kTC.postRecord()
.kTC.endEdit()
.kTC.close()
.k.unattach()
'*********************
.ose source table TCursors
pundTC.close()
itformTC.close()
iitionTC.close()
getsTC.close()
:availTC.close()
:cTC.close()
:TC.close()
.oadTC.close()
:narioTC.close()
'*********************
:port the resulting files as ASCII Tab delimited files to :JMAP:
)ortASCIIVar(":JMAP:tbl_a1.db", ":JMAP:tbla1.txt", "\t", "", True, False)
)ortASCIIVar(":JMAP:tbl_a2.db", ":JMAP:tbla2.txt", "\t", "", True, False)
)ortASCIIVar(":JMAP:tbl_a3.db", ":JMAP:tbla3.txt", "\t", "", True, False)
)ortASCIIVar(":JMAP:tbl_a4.db", ":JMAP:tbla4.txt", "\t", "", True, False)
)ortASCIIVar(":JMAP:tbl_a5.db", ":JMAP:tbla5.txt", "\t", "", True, False)
)ortASCIIVar(":JMAP:tbl_b.db", ":JMAP:tblb.txt", "\t", "", True, False)
)ortASCIIVar(":JMAP:tbl_c.db", ":JMAP:tblc.txt", "\t", "", True, False)
)ortASCIIVar(":JMAP:tbl_d.db", ":JMAP:tbld.txt", "\t", "", True, False)
)ortASCIIVar(":JMAP:tbl_e.db", ":JMAP:tble.txt", "\t", "", True, False)
)ortASCIIVar(":JMAP:tbl_f.db", ":JMAP:tblf.txt", "\t", "", True, False)
)ortASCIIVar(":JMAP:tbl_g.db", ":JMAP:tblg.txt", "\t", "", True, False)
)ortASCIIVar(":JMAP:tbl_h.db", ":JMAP:tblh.txt", "\t", "", True, False)
)ortASCIIVar(":JMAP:tbl_i.db", ":JMAP:tbli.txt", "\t", "", True, False)
)ortASCIIVar(":JMAP:tbl_j.db", ":JMAP:tblj.txt", "\t", "", True, False)
)ortASCIIVar(":JMAP:tbl_k.db", ":JMAP:tblk.txt", "\t", "", True, False)

.en, copy the *.txt files to a floppy disk for transport to a SUNSparc
.rceDir="C:\\HLM\\JMAP\\*.txt"
.ild a test for floppy disk not found in Drive A?

eate a directory named "JMAP" on Drive A floppy & copy files
makeDir("A:\\JMAP")
copy(":JMAP:tbla1.txt", "A:\\JMAP\\tbla1.txt")
copy(":JMAP:tbla2.txt", "A:\\JMAP\\tbla2.txt")
copy(":JMAP:tbla3.txt", "A:\\JMAP\\tbla3.txt")
copy(":JMAP:tbla4.txt", "A:\\JMAP\\tbla4.txt")
copy(":JMAP:tbla5.txt", "A:\\JMAP\\tbla5.txt")
copy(":JMAP:tblb.txt", "A:\\JMAP\\tblb.txt")
copy(":JMAP:tblc.txt", "A:\\JMAP\\tblc.txt")
copy(":JMAP:tbld.txt", "A:\\JMAP\\tbld.txt")
copy(":JMAP:tble.txt", "A:\\JMAP\\tble.txt")
copy(":JMAP:tblf.txt", "A:\\JMAP\\tblf.txt")
copy(":JMAP:tblg.txt", "A:\\JMAP\\tblg.txt")
copy(":JMAP:tblh.txt", "A:\\JMAP\\tblh.txt")
copy(":JMAP:tbli.txt", "A:\\JMAP\\tbli.txt")
copy(":JMAP:tblj.txt", "A:\\JMAP\\tblj.txt")
copy(":JMAP:tblk.txt", "A:\\JMAP\\tblk.txt")

method
```

BDM FEDERAL, INC.

ATTACHMENT 5

LANL HLM DATABASE DEVELOPMENT

FINAL BRIEFING

BDM

LANL HIGH-LEVEL MODEL DATABASE DEVELOPMENT

FINAL BRIEFING

NOVEMBER 1994

CONTRACT NUMBER: 1598F0013-95
EXPIRATION DATE: 30 NOV 95
SHORT TITLE: LANL HLM DB

CONTRACTOR: BDM FEDERAL, INC.
PROGRAM MANAGER: T.R. HOOKER
TELEPHONE: (703) 848-5943

BDM

BRIEFING AGENDA

- STATEMENT OF WORK
- CHALLENGES
- FOCUS AREAS
- DATABASE DESIGN / STRUCTURE
- SIMULATION MODEL POST-PROCESSORS
- DATABASE / DATA DEVELOPMENT
- PROJECT DELIVERABLES

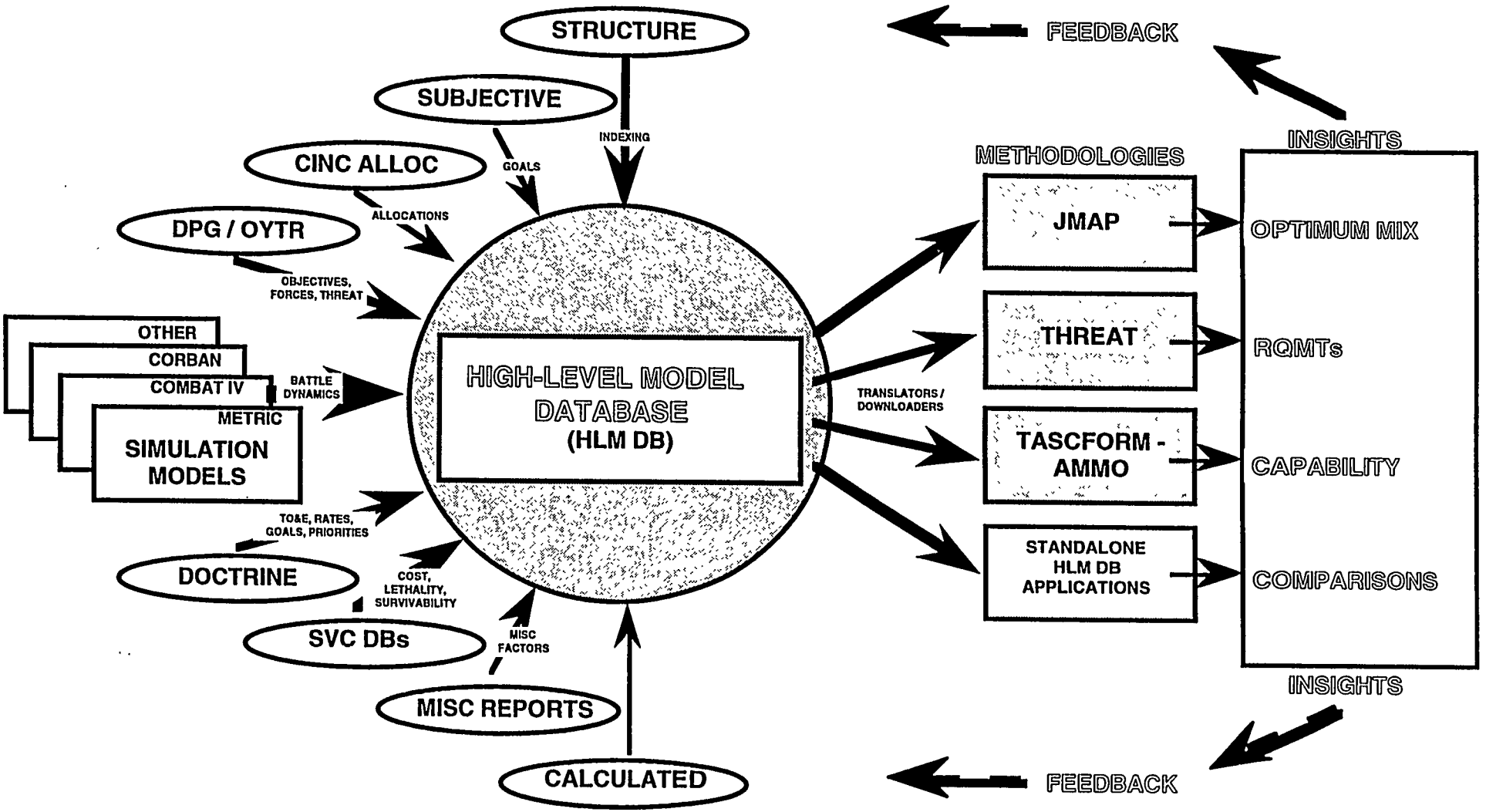
BDM

STATEMENT OF WORK

- (T1 - ESTABLISH DATA DEFINITIONS, SOURCES & FORMATS)
  - DETERMINE HLM DATA REQUIREMENTS - TYPES, DEFINITIONS, FORMATS
  - IDENTIFY DATA SOURCES; REVIEW WITH TDA
  - ESTABLISH OUTPUT FORMATS FOR DIRECT ELECTRONIC DATA TRANSFER
- T2 - DATA SOURCE POST-PROCESSING DESIGN
  - DEVELOP SOFTWARE TO POPULATE DATABASES
  - CONDUCT PROOF-OF-PRINCIPLE BY EXERCISING MODELS & OTHER SOURCES
  - GENERATE DATASET FOR KOREA SCENARIO; DOCUMENT
  - TRANSFER DATASET ELECTRONICALLY TO OM/TDA
- (T3 - POST-PROCESSOR REFINEMENT)
  - ACCOMPLISH SOFTWARE MODS INCORPORATING OM/TDA COMMENTS
- T4 - COMPLETE POST-PROCESSOR IMPLEMENTATION
  - EXERCISE DATA SOURCES TO GENERATE ADDITIONAL DATASETS (SWA)
  - TRANSFER DATASET ELECTRONICALLY TO OM/TDA

BDM

MUNITIONS RD&A ASSESSMENT -
OFFICE OF MUNITIONS OBJECTIVE SYSTEM



BDM

CHALLENGES

- CUSTOMERS - LANL, (OM), (J-8), (TWP)
- TIME ⇒ REQUIREMENTS CHANGE / GROWTH
  - DOD FOCUS - SCENARIOS, CBMR, JWCA, PROGRAMS
  - TASCFORM-AMMO V. 1.0 VS V. 2.0
- SYNCHRONIZATION
  - P, M, Ts
  - SIMULATION POST-PROCESSORS
- COMPREHENSIVENESS ⇒ EXPONENTIAL EXPANSION
- DATA REALISM / AVAILABILITY
  - PRIORITIES - ESSENTIAL, COMMON, NICE, WHAT ??
  - DIFFICULT & TIME-CONSUMING PROCESS
- "SYSTEM" APPROACH & INTEGRATION
- ADMIN - SIMULTANEOUS ANALYSIS, TURBULENCE

BDM

FOCUS AREAS

- **MODELS & SCENARIOS**
  - JMAP, THREAT, TASCFORM-AMMO v. 2.0
  - CURRENT DPG IPS MRC BASIS
- **STRUCTURE / FUNCTION**
  - DB DESIGN
  - DB STRUCTURE
  - USER INTERFACE
  - DB DOWNLOADERS
  - SIMULATION POST-PROCESSORS
- **DATA**
  - PLATFORM QUANTITIES - TIME-PHASED ARRIVALS, ≥120 TYPES
  - MUNITIONS INVENTORIES - PREFERRED & ALT) ≥ 20 mm, FY85-10, ≥100 TYPES
  - TARGET QUANTITIES - OYTR BASIS, COMPLEX TARGET DECOMPOSITION, 83 TYPES
  - LETHALITY DATA - ≥ 5,000 DISCRETE MT PAIRS, SCENARIO TAILORED, PMT GENERATION
- **PRIORITIES, REALISM, CONSISTENCY**

BDM

DATABASE DESIGN / STRUCTURE

- OBJ - DEVELOP COMPLETE DATABASE SYSTEM FOR HLMs
- PC WINDOWS-BASED (PARADOX) APPLICATION
  - USER-FRIENDLY, SIMPLE HIGH-LEVEL INTERFACE
  - CURRENT GENERATION RDBMS CAPABILITIES - QUERIES, SCRIPTS, REPORTS
  - CUSTOMINPUT / OUTPUT KEYED TO HIGH-LEVEL MODELS
  - EXCELLENT INTERFACES WITH EXTERNAL SYSTEMS - MAC, SUN
- CHALLENGES
  - DEFINITIONS, LINKAGES & COMMONALITIES
  - TASCFORM-AMMO DOWNLOADER PARTICULARLY DIFFICULT
- STATUS
  - DESIGN / STRUCTURE -100%, DOWNLOADERS -90%, UPLOADERS -90%
  - REFINEMENTS GENERALLY EASY; CONTINUOUS PROCESS

BDM

SIMULATION MODEL POST-PROCESSORS

- OBJ - LINK M v. M SIMULATIONS TO HIGH LEVEL MODELS
- THREE SIMULATION MODELS & POST-PROCESSORS
  - METRIC AND COMBAT IV - THEATER-LEVEL, CORBAN - CORPS-LEVEL, WAM
  - SUN ENVIRONMENT
- CHALLENGES
  - COMPLEXITY - DEFINITIONS, PMT MAPPING, AGGREGATION
  - SIMULATION COMBAT PROCESSES vs DATA REQUIREMENTS
  - COMPETITION FOR ASSETS; OVERHEAD - ADMIN/MGMT, SPIN-UP
- STATUS
  - METRIC -85%, IV -95% (60%), CORBAN -95%
  - SOME AREAS NEED REFINEMENT
- LEGACY
  - PERIODIC DATA "SLICES" - MLR, AAAV, J-8, . . .
  - INCREMENTAL GROWTH & REFINEMENT
    - » BASIC CODE
    - » POST-PROCESSORS
    - » ENVIRONMENT

BDM

DATA / DATA DEVELOPMENT

- OBJ - DEVELOP ALL REQUIRED HLM DATA ELEMENTS
- SOURCES - SIMULATIONS, SERVICES, DBs, . . .
  - THREE SIMULATION MODELS & POST-PROCESSORS
  - MANY SOURCES FOR OVERALL INPUT DATASETS
- CHALLENGES
  - BREADTH & DEPTH ⇒ MULTI-SERVICE TACTICAL WARFARE EXPERTISE
  - COMPREHENSIVENESS ⇒ EXPONENTIAL EXPANSION
  - DATA REALISM & AVAILABILITY
  - CONSISTENCY, CALLIBRATION & REFINEMENT
- STATUS
  - ESSENTIAL DATA IN-PLACE; MANY PLACEHOLDERS FOR ALT OR FUTURE SYSTEMS
  - FILL VARIES BY DATA ELEMENT (& WITHIN THE DATA ELEMENT)
  - SOME AREAS NEED REFINEMENT
- PRODUCT
  - COMPREHENSIVE, TAILORED MUNITIONS-FOCUED DATABASE
  - ALREADY IN USE SUPPORTING SELECTED OSD ASSESSMENTS
  - INCREMENTAL GROWTH & REFINEMENT
    - » DATA FILL
    - » EXTERNAL REVIEW

BDM

PROJECT DELIVERABLES

- **HLM DATABASE**
  - STRUCTURE — ELECTRONIC MEDIA
  - USER INTERFACE — ELECTRONIC MEDIA
  - DATA FILES — ELECTRONIC MEDIA
  - DOWNLOADERS — ELECTRONIC MEDIA
  - UPLOADERS — ELECTRONIC MEDIA
- **HLM DATASETS**
  - KOREA - JMAP, THREAT, TASCFORM-AMMO (PARTIAL) — ELECTRONIC MEDIA
  - SWA - JMAP, THREAT, TASCFORM-AMMO (PARTIAL) — ELECTRONIC MEDIA
- **DOCUMENTATION**
  - ELECTRONIC NOTATION — ELECTRONIC MEDIA
  - (WORKING NOTEBOOKS) — RETAINED BY BDM
- **(SIMULATION POST-PROCESSORS)** — (RETAINED BY BDM)