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CH-47C/HLH R AND M SIMULATION ANALYSIS

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Boeing Vertol Company

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Development Laboratory

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The Eustis Directorate of the U. S. Army Air Mobility Research and Development Laboratory is developing a simulation capability for assessing the systems-level impact of predicted changes in component reliability and maintainability (R&M) parameters and in proposed changes to maintenance concepts. A general R&M probabilistic simulation model is being used to establish this capability. The R&M simulation model can be used with any aircraft type; e.g., when the requisite input data for the CH-47C has been defined, the model then becomes the CH-47C R&M simulation model. The approach used is to develop a baseline case for a specific aircraft type and then to simulate an alternative configuration and conduct a comparative analysis. This Boeing Vertol report documents the baseline development for the CH-47C and the developmental Heavy Lift Helicopter.

The conclusions and recommendations contained herein are concurred in by this directorate. The comparative analysis contained in this report can be easily replicated or modified for application to other problem areas. The R&M simulation model used, however, is a complex tool that requires substantial skill in application and analysis of results.

The technical monitor of this contract was Mr. Robert L. Walker, Military Operations Technology Division.

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Block 20. Abstract - continued.

The steps taken to perform an analytical validation of the two models (CH-47C and HLH) are demonstrated.

Documentation and rationale are presented for modifications made, under this study, to an original Government-furnished R&M simulation model.

The results of this study are validated R&M simulation models for the CH-47C and HLH and a comparative analysis of the simulated ability of the CH-47C and HLH to perform various missions under several diverse maintenance support plans.

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PREFACE

This report presents a study to develop valid CH-47C and 'UH R&M simulation models, conducted under Contract DAAJ02-73-C-0031, Project IF162203A119, for the Eustis Directorate, U.S. Army Air Mobility Research and Development Laboratory (USAAMRDL), Fort Eustis, Virginia.

USAAMRDL technical direction was provided by Mr. R. Walker and Mr. H. Bratt.

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INTRODUCTION

Assessment of potential Reliability and Maintainability (R&M) hardware component research efforts requires an evaluation of the benefit of the proposed effort. Application of an Army-developed R&M simulation model to a specific helicopter type can provide a realistic, timely assessment of research potential. The approach consists of changing the "component R&M definitions" or maintenance concepts to reflect the desired changes, processing the resultant configuration through the R&M model, and then performing comparative analysis of the results.

One of the primary reasons for developing a simulation model is to evaluate operational relationships that are impractical or impossible to analytically investigate. Many of the problems which the model is used to solve are related to the availability/utilization function. The impact that variations in utilization have upon availability, personnel, spares, and support equipment usage can best be analyzed by means of simulation.

Personnel allocations, probability of spares availability, failure rates, and maintainability rates are entered as input to the model. Operating under the strictures defined by a prearranged mission schedule and maintenance philosophy, the model--by implementation of a Monte Carlo selection routine--selects certain tasks to be performed to simulate the repair of randomly occurring failures. Thus, by simulating the maintenance occurring over any given time frame, the model gives its user the ability to analyze his resource allocations. A flow diagram (Figure 1) presents an overview of how the operational and maintenance environment is simulated for a company of aircraft.

To provide a means of R&M assessment, Boeing Vertol has developed and documented in this study valid R&M simulations of the CH-47C and the developmental Heavy Lift Helicopter (HLH). Applicable R&M data was analyzed and transformed into probabilistic statements for input into the Government-furnished R&M simulation model. Alternative inspection schemes were developed and simulated and the results evaluated in terms of operational and logistics support impact. This scheme was accomplished by performing the tasks described in the flow chart in Figure 2.

The result of this study provides CH-47C and HLH models through which scheduled operations and available maintenance resources can be used to determine their effect on equipment availability and maintenance resource usage rate. Various relationships such as the availability/utilization relation

may be investigated and optimized in compliance with the constraints inflicted by the resources available and mission designated.

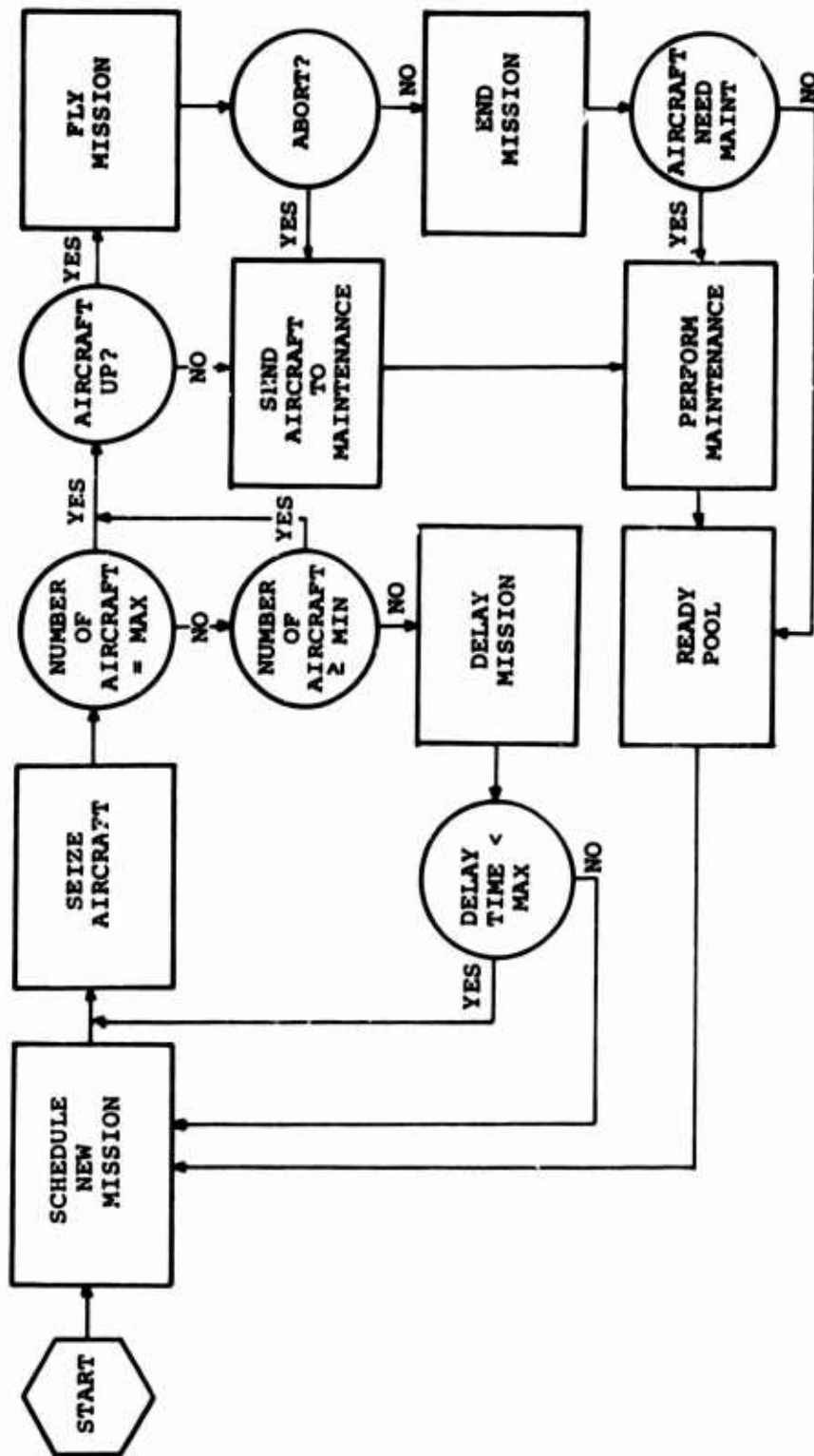


Figure 1. General Helicopter R&M Simulation Flow.

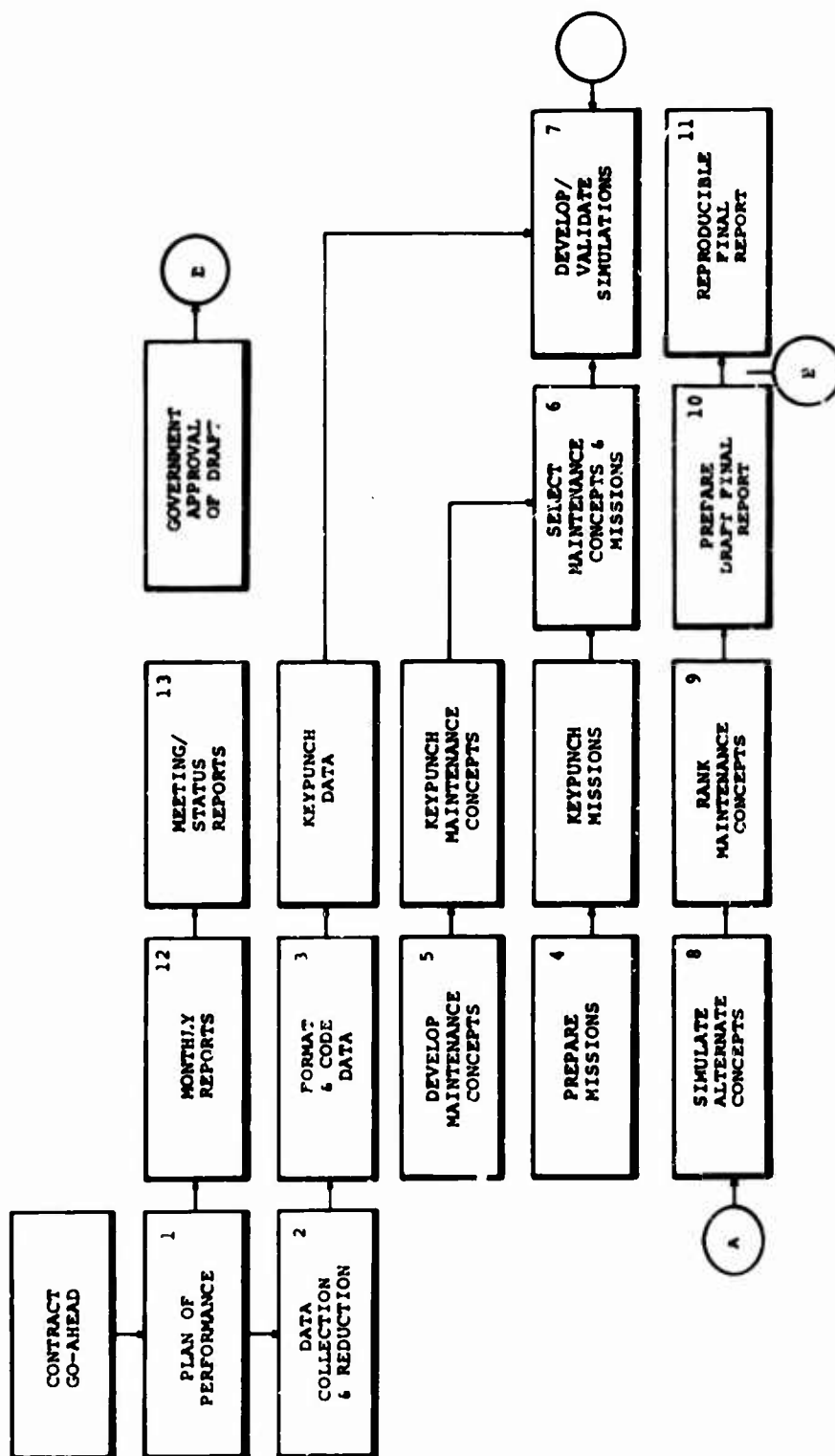


Figure 2. Program Flow Diagram.

BASELINE MODEL DEVELOPMENT

INTRODUCTION

It was the intent of this study to develop validated simulation models for the CH-47C and HLH and employ these models in a maintenance concept comparative analysis to demonstrate model capability for analytical application.

As such, the baseline models have been defined in a sufficiently general manner to allow for the comparative analysis with no logical modifications to the model. Rather, the mission concept and maintenance parameters, unique to the baseline models, are all defined by input data cards.

CH-47C - BASELINE MODEL DEFINITION

The probabilistic and deterministic R&M function tables have been defined for the baseline CH-47C model by direct application of historical data. It is felt that, although this data is a composite generated by aircraft flying rather diverse missions, the distribution of missions flown had a tendency to be centrally located around the baseline mission. Furthermore, the maintenance concept employed in support of the aircraft which generated this data base was, with only minor exceptions, identical to the baseline maintenance concept defined for use in the simulation model. Thus, the baseline model is considered an accurate representation of the actual O&M concept employed on the CH-47C.

CH-47C BASELINE MISSION

The baseline CH-47C mission is a composite developed over hundreds of thousands of flight hours of Chinook application in CONUS, Europe, and Southeast Asia. The expected CH-47C monthly utilization derived from the data generated by this experience is approximately 54 hours per aircraft per month. Furthermore, this data shows an expected Chinook mission length of 1.5 flight hours per mission.

The standard CH-47C company consists of 16 aircraft. For the baseline mission, a delay of up to 30 minutes is acceptable before a mission is scrubbed. Another baseline flight consideration is the requirement that a standby aircraft be maintained in a ready status at all times during the scheduled flying intervals.

Table I is the first page of output from the CH-47C simulation model. It defines the O&M scenario being simulated. Contained in this table are the precise times and number of aircraft relevant to each launch for the baseline mission.

CH-47C Baseline Maintenance Concept

The nucleus of the CH-47C maintenance concept is the 100-hour PMP. Almost half of all unscheduled maintenance and essentially all scheduled maintenance occur at this inspection. Reference can be made to the subsequent section of this report dealing with R&M Input Data to identify the quantitative basis for this qualitative statement.

The other essential elements of the CH-47C maintenance concept are the 25-hour PMI and daily inspection. When taken in conjunction with the PMP, these inspections account for the detection and correction of almost all unscheduled CH-47C maintenance requirements. The only--and rather obvious--exceptions to this statement are those failures detected during flight. Those failures, causing downing, but not aborts, are repaired immediately upon mission completion. This is contingent, of course, upon the availability of the necessary maintenance resources.

Table I provides a narrative, established by the simulation model, of the maintenance concept being simulated. The parametric values relevant to the CH-47C baseline maintenance concept are contained in Table II.

The manner in which the parametric entities of the baseline maintenance concept and mission are input to the model is identified in the input data cards displayed in Table III.

TABLE I. CH-47C R&M SIMULATION MODEL SCENARIO-BASELINE

Scenario Simulated

One platoon of 16 Army helicopters.

Flying program consisted of 7 flying days per week, with each simulation interval covering an 8-week period.

Mission duration is 1.5 hours with a utilization of 108 hours per aircraft for the 8-week period.

Launch schedule during each flying day

0700	3 aircraft	0830	3 aircraft
1000	3 aircraft	1130	3 aircraft
1300	3 aircraft	1430	3 aircraft
1600	3 aircraft	1730	3 aircraft
1900	3 aircraft		

Other Flight Considerations

Standby aircraft ready at all times during the scheduled flying intervals.

Mission flight is possible up to 30 minutes after scheduled flight time. After this interval, flight is scrubbed.

Maintenance Concept Simulated

Periodic maintenance inspections (PMP) occur at intervals of 100 hours.

Preventive maintenance daily (PMD) inspections occur daily if the aircraft has flown or every 72 hours if not flying. Maintenance personnel are available between 0600 and 2200 during the 7-day flying period per week.

The aircraft consists of 293 elements. There are 16 time change components within this total.

An intermediate inspection (PMI) is performed every 25 flight hours.

Organizational maintenance includes an integrated direct support maintenance capability.

Off equipment component maintenance is performed at the depot level.

Condemnation or NRTS status is a dummy evaluation.

Basic CH-47C mission and maintenance philosophy.

TABLE II. BASELINE CH-47 MODEL PARAMETERS

- 16 aircraft per platoon
- 100-hour PMP, requiring 6 men for 7.5 hours each
- 25-hour PMI, requiring 3.5 men for 3.4 hours each
- Daily inspection performed @ 1830 each day requiring 2 men for 2.4 hours each
- TBO values ranging from 300 hours to 2400 hours
- Utilization of 54 hours per aircraft per month
- Maintenance action rate of 1.3 per flight hour
- Flying and maintenance take place 7 days a week
- 2 maintenance shifts of 8 hours each used daily

TABLE III. BASELINE CH-47C MODEL INPUT CARDS

INITIAL	441(1.2),185	TIME TO START DAILY-10THS OF HOURS	0151400
INITIAL	441(1.3),240	TIME BETWEEN STARTS-10THS OF HRS	0151700
INITIAL	441(1.4),75	END OF DAY IN 10THS OF HRS	0151900
INITIAL	441(1.5),34	END OF DAY IN 10THS	0151900
INITIAL	441(1.10),3	FLYING (FLYING) BETWEEN	0152100
		START - END IN 10THS	0152100
INITIAL	441(2.1),40	NUMBER OF A/C. FOR 10THS	0152200
INITIAL	441(2.1),75	END OF DAY A/C. FOR 10THS	0152300
INITIAL	441(2.1),35	NUMBER OF A/C. FOR 10THS	0152400
INITIAL	441(2.1),34	END OF DAY A/C. FOR 10THS	0152500
INITIAL	441(2.2),0	NUMBER OF A/C. FOR 10THS	0152600
INITIAL	4197,14		0152700
INITIAL	441(2.3),0	(GROSS DELAY)-PARTS/1000 (500=50%)	0152800
INITIAL	441(2.5),0	AIR DELAY -10THS	0152900
INITIAL	441(2.4),70100	MAX FLYING HOURS PER DAY - 10THS	0153000
INITIAL	441(2.7),0		0153100
INITIAL	441(2.9),5	TIME TO SET PART FROM STOCK-10THS	0153500
INITIAL	441(3.1),6720	INTERVAL -10THS OF HRS	0153600
INITIAL	441(5.2),0	UNACCELERATED -10THS OF HRS	0153700
INITIAL	441(5.3),0	UNACCELERATED -10THS OF HRS	0153800
INITIAL	441(5.4),0	UNACCELERATED -10THS OF HRS	0153900
INITIAL	441(5.7),0	UNACCELERATED -10THS OF HRS	0154000
INITIAL	441(5.1),0		0154100
INITIAL	441(1.10),1	NUMBER OF A/C. FOR 10THS	0154200
INITIAL	441(1.1),40	1ST START -10THS OF HRS	0154300
INITIAL	441(2.1),90	2ND START -10THS OF HRS	0154400
INITIAL	441(1.8),60	START 1ST START -10THS OF HRS	0154500
INITIAL	441(1.14),14	A/C. FOR 10THS	0154600
INITIAL	441(1.5),1	LAUNCH # 1 MISSION TYPE-1ST PRIORITY	0154700
INITIAL	441(2.5),1	LAUNCH # 2 MISSION TYPE-1ST PRIORITY	0154800
INITIAL	441(3.5),1	LAUNCH # 3 MISSION TYPE-1ST PRIORITY	0154900
INITIAL	441(4.5),1	LAUNCH # 4 MISSION TYPE-1ST PRIORITY	0155000
INITIAL	441(5.5),1	LAUNCH # 5 MISSION TYPE-1ST PRIORITY	0155100
INITIAL	441(6.5),1	LAUNCH # 6 MISSION TYPE-1ST PRIORITY	0155200
INITIAL	441(7.5),1	LAUNCH # 7 MISSION TYPE-1ST PRIORITY	0155300
INITIAL	441(8.5),1	LAUNCH # 8 MISSION TYPE-1ST PRIORITY	0155400
INITIAL	441(9.5),1	LAUNCH # 9 MISSION TYPE-1ST PRIORITY	0155500
INITIAL	441(1.10),3	LAUNCH # 1 NUMBER A/C -1ST PRIORITY	0155600
INITIAL	441(2.10),3	LAUNCH # 2 NUMBER A/C -1ST PRIORITY	0155700
INITIAL	441(3.10),3	LAUNCH # 3 NUMBER A/C -1ST PRIORITY	0155800
INITIAL	441(4.10),3	LAUNCH # 4 NUMBER A/C -1ST PRIORITY	0155900
INITIAL	441(5.10),3	LAUNCH # 5 NUMBER A/C -1ST PRIORITY	0156000

TABLE III. Continued

TOTAL	441(4,10),3	LAUNCH # 5 NUMBER A/C -1ST PRIORITY	00156100
TOTAL	441(7,10),3	LAUNCH # 7 NUMBER A/C -1ST PRIORITY	00156200
TOTAL	441(4,10),3	LAUNCH # 9 NUMBER A/C -1ST PRIORITY	00156300
TOTAL	441(3,10),3	LAUNCH # 2 NUMBER A/C -1ST PRIORITY	00156400
TOTAL	441(1,11),70	TIME TO BEGIN 1ST LAUNCH PREP.	00156500
		MINUS 2 CLOCK UNITS.	00156600
TOTAL	441(2,11),15	TIME BETWEEN THIS LAUNCH & PREVIOUS	00156700
TOTAL	441(4,11),15	TIME BETWEEN THIS LAUNCH & PREVIOUS	00156800
TOTAL	441(3,11),15	TIME BETWEEN THIS LAUNCH & PREVIOUS	00156900
TOTAL	441(5,11),15	TIME BETWEEN THIS LAUNCH & PREVIOUS	00157000
TOTAL	441(7,11),15	TIME BETWEEN THIS LAUNCH & PREVIOUS	00157100
TOTAL	441(4,11),15	TIME BETWEEN THIS LAUNCH & PREVIOUS	00157200
TOTAL	441(3,11),15	TIME BETWEEN THIS LAUNCH & PREVIOUS	00157300
TOTAL	441(1,12),9	NUMBER OF LAUNCHES PER DAY	00157400
TOTAL	441(4,12),0	SLACK TIME HOURS TYPE 1 (10THS)	00157500
TOTAL	441(4,12),0	TOTAL TIME FROM CALL TO LAUNCH-10THS	00157600
TOTAL	441(4,13),0	END OF ATTACHMENT IN 10THS	00157700
TOTAL	441(7,13),0	LAUNCH TIME TO REPLACE AIRCRAFTS-10THS	00157800
TOTAL	441(1,17),999	PERCENT IN-FLT AIRCRAFTS REPLACED/1000	00157900
TOTAL	441(1,15),1	NO. STATIONS A/C BY HOURS TYPE	00158000
TOTAL	441(1,19),7	FLT STATIONS FOR AIRCRAFT REPLACEMENTS	00158100
TOTAL	441(1,16),2	NO. OF LAUNCH EVENTS BY HOURS TYPE	00158200
TOTAL	441(1,21),5	TIME LAUNCH #4774 STATION OPEN	00158300
TOTAL	445(25,1),2400	T87 INTERVAL IN 409-TTEM # 1	00158400
TOTAL	445(25,2),1400	T87 INTERVAL IN 409-TTEM # 2	00158500
TOTAL	445(25,3),2000	T87 INTERVAL IN 409-TTEM # 3	00158600
TOTAL	445(25,4),1200	T87 INTERVAL IN 409-TTEM # 4	00158700
TOTAL	445(25,5),1200	T87 INTERVAL IN 409-TTEM # 5	00158800
TOTAL	445(25,6),1200	T87 INTERVAL IN 409-TTEM # 6	00158900
TOTAL	445(25,7),1200	T87 INTERVAL IN 409-TTEM # 7	00159000
TOTAL	445(25,8),1200	T87 INTERVAL IN 409-TTEM # 8	00159100
TOTAL	445(25,9),2000	T87 INTERVAL IN 409-TTEM # 9	00159200
TOTAL	445(25,10),2400	T87 INTERVAL IN 409-TTEM # 10	00159300
TOTAL	445(25,11),1200	T87 INTERVAL IN 409-TTEM # 11	00159400
TOTAL	445(25,12),1200	T87 INTERVAL IN 409-TTEM # 12	00159500
TOTAL	445(25,13),1200	T87 INTERVAL IN 409-TTEM # 13	00159600
TOTAL	445(25,14),1200	T87 INTERVAL IN 409-TTEM # 14	00159700
TOTAL	445(25,15),300	T87 INTERVAL IN 409-TTEM # 15	00159800
TOTAL	445(25,16),300	T87 INTERVAL IN 409-TTEM # 16	00159900
TOTAL	445(25,17),30000	T87 INTERVAL IN 409-TTEM # 17	00160000
TOTAL	445(25,19),30000	T87 INTERVAL IN 409-TTEM # 19	00160100
TOTAL	445(27,1),0317	T87 TTEM-ELEMENT # 1	00160200
TOTAL	445(27,2),0325	T87 TTEM-ELEMENT # 2	00160300
TOTAL	445(27,3),0329	T87 TTEM-ELEMENT # 3	00160400
TOTAL	445(27,4),0333	T87 TTEM-ELEMENT # 4	00160500
TOTAL	445(27,5),0335	T87 TTEM-ELEMENT # 5	00160600
TOTAL	445(27,6),0337	T87 TTEM-ELEMENT # 6	00160700
TOTAL	445(27,7),0339	T87 TTEM-ELEMENT # 7	00160800
TOTAL	445(27,8),0341	T87 TTEM-ELEMENT # 8	00160900
TOTAL	445(27,9),0343	T87 TTEM-ELEMENT # 9	00161000
TOTAL	445(27,10),0347	T87 TTEM-ELEMENT # 10	00161100
TOTAL	445(27,10),0357	T87 TTEM-ELEMENT # 10	00161200

TABLE III. Continued

[illegible]

HLH - Baseline Model Definition

All R&M input parameters employed in the definition of the HLH model have been developed extraneous to this study by Boeing Vertol Reliability and Maintainability Engineering Analyses. In all these analyses, the baseline mission and maintenance concept were held constant (and identical to those subsequently employed in the simulation model development). Described by prudent synthesis of analytical evaluation and engineering judgement, the baseline HLH model is the most accurate representation of the realistic application of the aircraft available.

HLH Baseline Mission

It is anticipated that a standard HLH company will contain 9 aircraft. These aircraft will each fly approximately 50 hours per month, primarily composed of 2.0-hour missions.

Again, as was the case for the CH-47C baseline model, a standby aircraft is required at all times during scheduled flying operations.

Table IV, the first page of output of the HLH simulation model, defines the unique call times and numbers of aircraft per launch for the baseline HLH model.

HLH Baseline Maintenance Concept

The HLH maintenance concept is centered upon a 600-hour, periodic inspection divided into 12 autonomous, 50-hour phases. In reality, each of these phases, with only minor overlap for inspecting safety of flight items, will inspect distinct sections of the aircraft. The aircraft has been partitioned (with respect to maintenance) into 12 segments, each of which requires approximately the same amount of look-phase inspection time.

Theoretically, the components located in the aircraft partition being inspected during any phase of the PMP should have a higher probability of maintenance than those not being inspected. However, due to a practical limitation of the model, this area has been intentionally biased. That is, at each inspection phase, the same relative probability of detection distribution has been employed. It is felt, however, that this bias is minimal, considering the number of PMP's being performed per simulation and the size of the random variation in detected elements generated by each simulation run.

TABLE IV. HLH BASELINE MAINTENANCE CONCEPT

Scenario Simulated

One platoon of nine Army helicopters

Flying program consisted of 7 flying days per week, with each simulation interval covering an 8-week period.

Mission duration is 2.0 hours with a utilization of 100 mission flying hours per aircraft for the 8-week period.

0700	2 Aircraft
1000	1 aircraft
1300	3 aircraft
1400	1 aircraft
1900	2 aircraft

Other Flight Considerations

Standby aircraft ready at all times during the scheduled flying intervals.

Mission flight is possible up to 30 minutes after scheduled flight time. After this interval, flight is scrubbed.

Maintenance Concept Simulated

Phased periodic maintenance inspections occur at twelve intervals of 50 hours.

Preventive maintenance periodic (PMP) inspection is completed at 600-hour intervals.

FIRM inspections occur daily if the aircraft has flown or every 72 hours if not flying.

Maintenance personnel are available between 0600 and 2200 during the 7-day flying period per week.

The aircraft consists of 182 elements. There are no time change components within this total.

A 10-hour inspection is performed every 10 flight hours

Organizational maintenance includes an integrated direct support maintenance capability.

Off equipment component maintenance is performed at the depot level.

Condemnation or NRTS status is a dummy.

Evaluation

Basic HLH mission and maintenance philosophy.

The other elements of the HLH maintenance concept are a 10-hour inspection and a firm (daily) inspection.

Table V identifies the parametric values employed in the baseline HLH maintenance concept.

Figure 3 shows the logical interaction of the elements of the baseline HLH model, and quantifies some of the significant O&M parameters.

Evaluation of Government Furnished R&M Simulation Model

The Government-furnished R&M simulation model provided Boeing Vertol to use in this analysis was defined upon a UH-1N aircraft and Army operational procedures. The model is written in GPSS and requires approximately 300,000 bytes of CPU core, and 5 minutes of CPU time to execute. Originally, the model was logically too tight for general application. That is, the model was so dependent upon the R&M characteristics and mission scenario of the UH-1 helicopter, that it required significant modification in order that it could be applied in the manner required. The critical areas requiring modification were, (1) generalization of mission length application, (2) generalization of PMP/PMI decision, (3) activation of NORS logic, (4) accountability of NORS downtime, (5) expansion of PMI logic, and (6) an increase in the number of aircraft/company the model can accommodate.

Forty-three blocks of logic were added to the original twelve hundred and forty blocks. Twenty blocks of logic were modified. Approximately three hundred cards were added to the output editor. Several new variables were defined. Approximately three hundred savevalues were modified. The one hundred seventy three variable statements were labeled and the initial cards used in the CH-47 and HLH models were labeled.

It is felt that these generalizations to the model enabled Boeing Vertol to accomplish the contractually required comparative analyses in a more timely manner than would have been possible employing the original model without modification.

Appendix VI presents a detailed identification of the modifications made to the original Government-furnished R&M simulation model. These changes, taken in conjunction with the documentation of the original UH-1 model in Army Technical

Report 73-75, constitute the total documentation package for the CH-47C and HLH baseline R&M simulation model.

TABLE V. BASELINE HLH MODEL PARAMETERS

- 9 aircraft per platoon
- 50-hour phased PMP, requiring 2.5 men for 8.0 hours
- 10-hour inspection, requiring 2.5 men for 4.0 hours
- Firm inspection performed at 2100 each day requiring 2 men for 0.3 hour each
- All components operate on-condition
- Utilization of 50 hours per aircraft per month
- Basic mission length of 2.0 flight hours
- Maintenance action rate of 1.05 per flight hour
- Flying and maintenance take place 7 days a week
- 2 maintenance shifts of 8 hours each are used each day

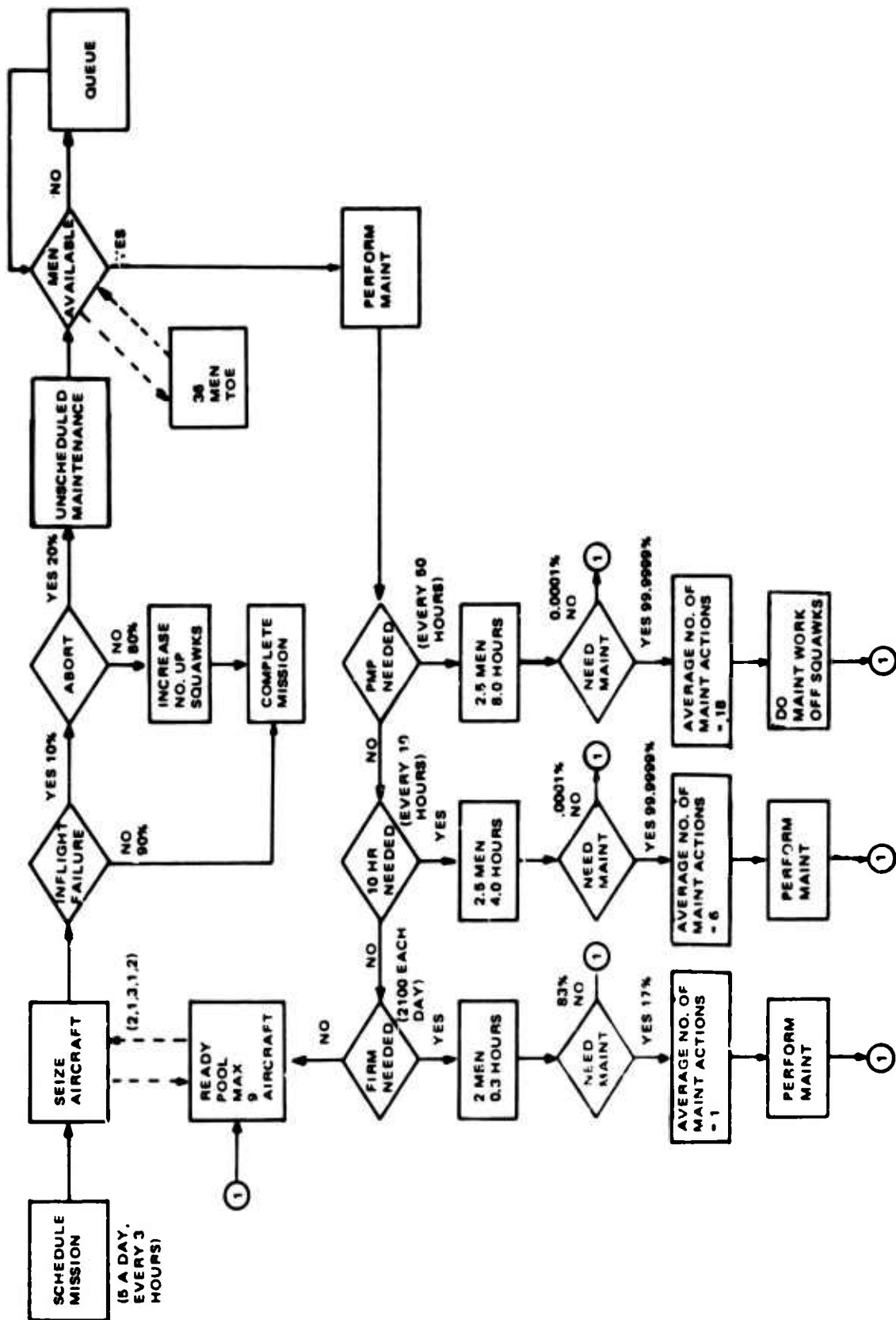


Figure 3. HLH Baseline Overview.

R&M INPUT DATA

INTRODUCTION

In order that the data collection and analysis task would not dominate the total engineering effort, this study was intended to make maximum use of available CH-47C and HLH R&M data. All basic R&M data elements such as maintenance action rates, mean times to repair, and crew sizes have been extracted from Vertol-developed and -maintained data banks. It has been assumed that all R&M data elements, extracted from the data banks and transformed into a format compatible with the model requirements, are quantitatively and qualitatively valid.

DATA SOURCES

CH-47C

R&M data inputs for the CH-47C have been extracted from the Boeing-Vertol CH-47C/L11 Reliability and Maintainability Field Experience Summary, based on 4132.2 flight hours at the U.S. Army Aviation Test Board, Fort Rucker, Alabama, between June 1969 and September 1970.

HLH

R&M input data for the HLH have been extracted from Boeing-Vertol Document D301-10004-1, HLH Preliminary Design Objectives for the subsystems not covered by the HLH Advanced Technology Components (ATC) contract. For the subsystems covered by the HLH ATC contract, the R&M input data have been extracted from the individual, elemental Maintenance Engineering Analyses (MEA's) performed by Boeing-Vertol maintainability engineering under the HLH ATC contract.

CH-47C R&M DATA

The basic R&M data used to develop the majority of functional and probabilistic inputs to the CH-47C model are contained in Appendix IV. It is felt that these data elements and their relationship to the model function table requirements are straightforward, not requiring any detailed discussion. This section discusses those input data elements which were developed analytically or through engineering judgement and, as such, warrant greater consideration. The function tables falling into this category are functions 2, 10, 12, 14, and 55.

Function 2 - The event probabilities of success coded in this table are based upon an analysis of the previously mentioned CH-47/L11 R&M field experience summary.

This evaluation showed that for the PMI and PMP inspections, there was virtually no probability of successfully performing the ground event; therefore, for the PMI and PMP events, numbers 8 and 17, respectively, in function Table 2, a value of .000001 has been coded.

This data analysis showed that, essentially, all daily inspections resulted in unscheduled maintenance actions. However, the data showed that the mean time between daily inspections is 6.7 flight hours. Further analysis shows the average utilization per aircraft per day is 3.5 hours. Thus the average number of days between dailies based on historical data for the CH-47C is estimated as 1.9 days. The model, as presently constructed, generally distributes use uniformly over each aircraft per company, rather than using one aircraft per day, which is, according to current CH-47C data, presently being employed. Therefore, a probability of detection of $1/1.9$ has been employed as the best estimate of daily inspection probability of failure. Thus for the daily inspection events, number 16 in function Table 2, a value of .500000 has been coded.

Function 10 - This function table contains the cumulative distribution function (CDF) for the number of maintenance actions detected in flight, given that at least one maintenance action has been detected in flight.

Quantitative data is not available for defining a table of this type; thus the distribution has been defined based on engineering judgement. The expected number of maintenance actions detected in flight, conditional upon the detection of at least one maintenance action is, 1.1 maintenance action for the mission length of 1.5 hours.

Function 12 - This function table contains the CDF for the occurrence of multiple maintenance actions at the daily inspection. In 615 daily inspections contained in the CH-47C data base, a total of 1913 maintenance actions were detected. This yields an expected number of maintenance actions of 3.1 per inspection. The manner in which these maintenance actions were distributed for the simulation analysis is shown in Figure 4.

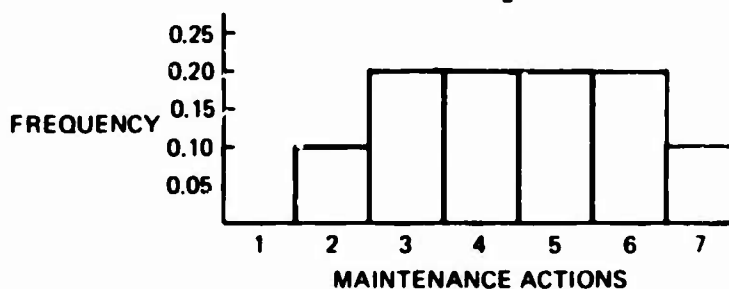


Figure 4. CH-47C Daily Maintenance Action Distribution.

Function 14 - Contained in this table is the cumulative distribution function for the number of maintenance actions detected at a PMP, given that at least one maintenance action has been detected at the PMP. An analysis of 41 PMP's contained in the CH-47C data base identified 2767 maintenance actions; thus the expected number of maintenance actions per failed PMP is 67.5. The values contained in this table have been derived by assuming that the distribution underlying the number of maintenance actions per failed PMP is the normal distribution with mean $\bar{X}$ equal to 67.5 and standard deviation S equal to $\bar{X}/6$ or 11.3.

Function 56 - This table contains the cumulative distribution function for the number of maintenance actions at a PMI, given that at least one maintenance action has been detected at the PMI. An expected number of maintenance actions per PMI of 6.7 has been estimated, based upon the 167 PMI's contained in the data and their resultant 1127 maintenance actions. Again, as in the case of the PMP a normal distribution with mean ($\bar{X}$) equal to 6.7 and standard deviation (S) equal to $\bar{X}/6$ or 1.1 is employed.

HLH R&M Data

Appendix V contains the basic R&M data inputs employed to develop the HLH model. As was the case for the CH-47C, the transition from predicted R&M data into function tables is basically straightforward enough to require no further discussion. However, the development of tables 2, 10, 12, 14, and 55 for the HLH, where no data was available, required definition and implementation of a mathematical model for estimating functional data elements.

A brief derivation of a math model which can be used for this purpose follows. The fundamental assumption of this model is that the number of maintenance actions detected at any inspection is positively correlated to the amount of time spent in look-phase maintenance at that event.

Assume that three inspections exist at which maintenance can be detected for a certain aircraft.

Further assume that for each of these three inspections, a known time between occurrence (f_i), crew size (C_i), and EMT (EMT_i) exists.

Now, establish an interval of arbitrary length (I), such that each inspection can be expected to occur an integral number of times.

Then, the expected number of maintenance actions per each occurrence of inspection i can be estimated as

$$\left(\begin{array}{c} \# \text{ MA'S} \\ @ \text{ inspection} \end{array} \right)_i = \frac{(C_i)(EMT_i)}{\sum_{j=1}^3 \frac{(C_j)(EMT_j)}{(f_j)} (MTBMA)}$$

It is recommended that the previous equation be modified for most applications to include a deferral factor (d_i). Thus, the equation becomes

$$\left(\begin{array}{c} \# \text{ MA'S} \\ @ \text{ inspection} \end{array} \right)_i = \frac{(C_i)(EMT_i)(d_i)}{\sum_{j=1}^3 \frac{(d_j)(C_j)(EMT_j)}{(f_j)} (MTBMA)}$$

where the d_i values are chosen in such a manner that the MTBMA is held constant over interval L.

Now, assume that the number of maintenance actions at inspection i is Poisson distributed with mean equal to the

$$\left(\begin{array}{c} \# \text{ MA'S} \\ @ \text{ inspection} \end{array} \right)_i$$

One can now use a Poisson table to calculate the probability of exactly 0, 1, 2, 3, ..., N, ..., ∞ maintenance action, simultaneously occurring at inspection i .

The probability associated with 0 maintenance actions is one input required by the model - viz - event probability of success, contained in function 2.

In order to calculate the conditional distribution of maintenance actions per failed event, merely divide the probabilities associated with each number of maintenance actions by (1-event P (success)).

Do this for each of the i inspections. Thus, both types of probabilistic functions required by the model are developed.

To emphasize this technique, consider its application to the HLH, where the following data has been employed.

Event No.	Event Name	Time Between Occurrences	Crew Size	EMT	Deferral Factor
1	firm	2 hours	2	0.3	0.5
2	10-hour	10 hours	2.5	4.0	0.5
3	phased PMP	50 hours	2.5	8.0	1.0

This data, when taken with the total aircraft MTBMA (Mean Time Between Maintenance Actions) of 0.95 hour is then used in the math model, yielding the following results.

Event No. (i) Event Name No. Maintenance Actions_i/Cycle

1	firm	7.5
2	10-hour	24
3	phased PMP	20

Thus, using the frequency of occurrence of the i inspections and a subjective estimate of the probability of detecting maintenance at each of the i inspections, the following data has been developed for input to the probabilistic function tables.

Event No. (i)	Event Name	L/ f_i	No. Maintenance Actions _i @ Inspection _i	Subjective Probability of Maintenance
1	firm	25	1.0	0.3
2	10-hour	4*	6.0	0.999999
3	phased PMP	1	20.0	0.999999

This data is then used to define function tables 2, 12, 14, and 55. Again (as was the case for the CH-47C) the assumption has been made for the PMI and PMP inspections that the number of maintenance actions detected per inspection is normally distributed with mean, $\bar{X}$, equal to the expected number of maintenance actions per inspection, and standard deviation, S , equal to $\bar{X}/6$.

For the daily and inflight conditional expected number of maintenance actions, function tables 10 and 12 respectively, a truncated Poisson distribution has been subjectively defined. The frequency distributions employed in constructing function tables 10, 12, 14 and 55 are shown in Figures 5 through 8.

Coding of the data presented in the succeeding plots in the format required by the function tables is demonstrated in Appendix VI.

*A PMI is not performed concurrently with the PMP, thus only 4 PMI's per cycle (not 5 as would be calculated using the formula) will take place.

90% of HLH inflight maintenance occurrences result in 1 maintenance action. 10% result in 2 maintenance actions

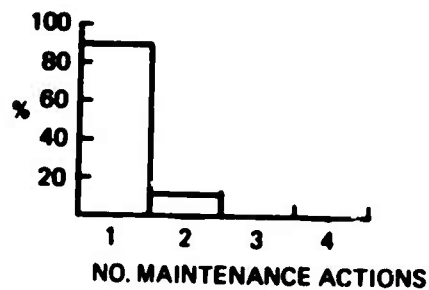


Figure 5. HLH Inflight Maintenance Action Distribution.

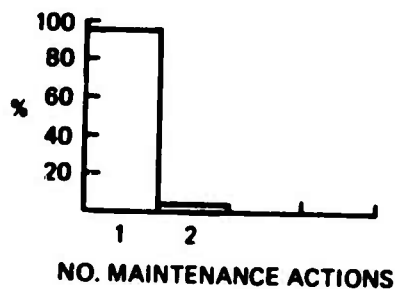


Figure 6. HLH Firm Maintenance Action Distribution.

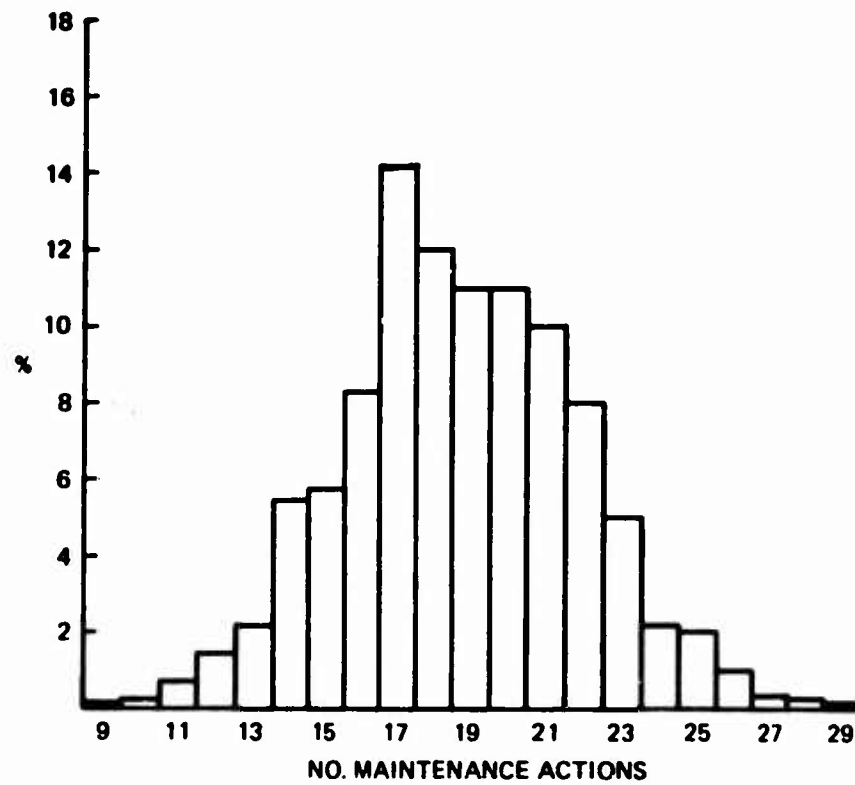


Figure 7. HLH PMP Maintenance Action Distribution.

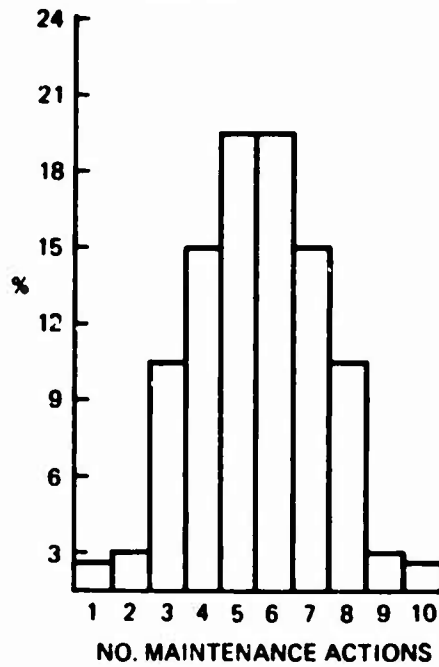


Figure 8. HLH 10-Hour Maintenance Action Distribution.

ALTERNATE MISSION AND MAINTENANCE CONCEPTS

This section identifies the several missions and maintenance concepts defined for the CH-47C and HLH as candidates for simulation in the R&M model. This will demonstrate the suitability of the model for application to typical maintenance analysis.

All missions defined are considered by the airframe manufacturer to be feasible applications of the aircraft being simulated.

All simulated maintenance concepts are based on realistic maintenance applications. As such, the alternate maintenance concepts and missions defined in this section represent a cross section of Operations and Maintenance (O&M) scenarios in which the aircraft could be utilized and maintained.

ALTERNATE MISSION CONCEPTS

CH-47C Missions

The four CH-47C simulated missions shown in Table VI are representative of the aircraft's uses. The following discussion will briefly define each of these four scenarios.

Combat Support (Basic Mission) - This mission is based on Chinook experience in the Republic of Vietnam. An average of 56 hours per aircraft per month is used. Sixteen aircraft are located in one spot. Scheduled missions require 3 aircraft for 1.5 hours per mission, and a standby aircraft is constantly kept ready during the scheduled flying periods.

Logistic Support (Alternate Mission 1) - This mission has been defined to be representative of Chinook application in a sustained surge mission, typical of a relatively high intensity conflict. A full company of sixteen CH-47C aircraft are located and deployed from one location in a resupply mission, generally requiring seven aircraft per mission for 1.5 hours per aircraft.

CONUS Minimum (Alternate Mission 2) - Several peacetime applications of the CH-47C have been combined into a composite CONUS mission. Eleven aircraft are deployed at one location where they perform functions varying from training missions to cargo handling. Each mission duration is 1.5 hours, with one aircraft required per mission.

Fort Rucker Lead-the-Fleet Program (Alternate Mission 3) - In order to provide Time Between Overhaul (TBO) extension data on CH-47C dynamic components, several Chinooks (usually three)

TABLE VI. CH-47C SIMULATED MISSIONS	
<u>Combat Support</u>	(Basic Mission)
Utilization = 56 hours/month/aircraft 2 hours/day/aircraft, 7 days a week Sixteen aircraft at a location One standby aircraft is required	
<u>Logistic Support</u>	(Alternate Mission 1)
Utilization - 168 hours/month/aircraft 6 hours/day/aircraft, 7 days a week Sixteen aircraft at a location Mission length is 1.5 hours and requires 7 aircraft No standby required	
<u>CONUS Minimum</u>	(Alternate Mission 2)
Utilization - 30 hours/month/aircraft 1.5 hours/day/aircraft, 5 days a week Eleven aircraft at a location Mission length is 1.5 hours and requires 1 aircraft No standby required	
<u>Fort Rucker</u>	(Alternate Mission 3)
Utilization = 100 hours/month/aircraft 5.0 hours/day/aircraft, 5 days a week Three aircraft at location Mission length is 1.5 hours and requires 1 aircraft No standby required	

have been located at the U.S. Army Aviation Test Board facility at Fort Rucker, Alabama, since 1963. These aircraft have been generally flown more than the rest of the CH-47 fleet.

For this analysis, 100 hours per aircraft per month has been employed. Each mission requires 1.5 hours with one aircraft required per mission. Flights occur 5 days a week rather than 7 days a week, as is the case for all other missions defined herein for the CH-47C.

HLH Missions

The HLH missions shown in Table VII represent four of the possible missions in which a Heavy Lift Helicopter could be employed. The following discussion will identify the pertinent operational characteristics of these areas.

HLH Combat Support Mission

This is the baseline mission for the Heavy Lift Helicopter. Nine aircraft are located in one spot and a utilization of 50 hours per aircraft per month is anticipated. Flying takes place over a 7-day week. Each mission requires between 1 and 3 aircraft and is assumed to take 2 hours. A standby aircraft, required at all times, is kept in an alert status during scheduled flying periods.

HLH Container Unloading

Three Heavy Lift Helicopters are deployed from a single spot (possibly a harbor) where they perform a container unloading mission. Due to the large amounts of cargo to be moved, missions of this type could be expected to place a high utilization requirement on the aircraft. For this analysis, a utilization of 150 hours per aircraft per month has been employed. Each 2-hour mission requires one aircraft and flying occurs 5 days a week.

HLH CONUS Mission

This mission is a composite of several of the CONUS missions in which a Heavy Lift could be employed, ranging from cargo handling to training missions. Nine aircraft will be deployed from one location. Missions, generally requiring three aircraft and taking 2 hours, will take place on a 5-day week basis.

TABLE VII. HLH SIMULATED MISSION PROFILES	
<u>HLH Combat Support Mission</u>	(Basic Mission)
Utilization = 50 hours/month/aircraft 1.8 hour/day, 7 days a week Nine aircraft at a location One standby aircraft is required	
<u>HLH Container Unloading</u>	(Alternate Mission 1)
Utilization = 150 hours/month/aircraft 7.5 hours/day, 5 days a week Three aircraft at a location Each mission is 2 hours long and requires only 1 aircraft No standby required	
<u>HLH CONUS Minimum</u>	(Alternate Mission 2)
Utilization = 20 hours/month/aircraft 1 hour/day, 5 days a week Nine aircraft at a location Each mission is 2 hours long and requires 3 aircraft No standby aircraft required	
<u>HLH Combat Support Surge Mission</u>	(Alternate Mission 3)
Utilization - 280 hours/month/aircraft 10 hours/day, 7 days a week Nine aircraft at a location Each mission is 5 hours long and requires 3 aircraft A standby aircraft is required	

HLH Combat Support Surge Mission

One of the more important operational requirements of the Heavy Lift Helicopter is that it can sustain a 300-hour per aircraft per month surge over a 60-day period. This mission would typify a high-intensity conflict where 9 aircraft, located at one spot, will be flying essentially every minute that they are available for flight, 7 days a week. It has been assumed for this analysis that each mission requires 3 aircraft and will take 5 hours. Due to the importance of this mission and the realization that contingencies could arise requiring that an additional aircraft be displaced to some other location, a standby aircraft is required.

ALTERNATE MAINTENANCE CONCEPTS

CH-47C Maintenance Concepts

Five maintenance concepts have been developed for the CH-47C, consisting of the baseline existing CH-47C maintenance concept and four alternative maintenance concepts. The four variations from the original or baseline concept represent significantly different philosophies of scheduled inspection and scheduled maintenance, varying from levels of TBO's for dynamic components to the elimination of all TBO's from the aircraft, that is, operating the aircraft on condition. The following discussion will briefly define each of these five maintenance concepts.

For all runs of the CH-47C comparative analysis, the same Table of Organization and Equipment (TOE Number 1-258H) has been employed. The personnel allocated within this TOE has been aggregated into 7 categories of personnel types for use in the simulation analysis. The quantities of personnel for each of these 7 categories, and the corresponding Army Military Occupation Specification (MOS) designations, are shown below. Two shifts of 8 hours each were used for all runs.

Skill Code	MOS Number	MOS Nomenclature	Shift 1 Quantity	Shift 2 Quantity
01	67UXX	Helicopter Repairman	20	10
02	68GXX	Airframe Repairman	12	6
03	35KXX	Avionics Repairman	3	2

Skill Code	MOS Number	MOS Nomenclature	Shift 1 Quantity	Shift 2 Quantity
04	35LXX	Avionics Repairman	2	0
05	68FXX	Electrical Repairman	4	2
06	68HXX	Hydraulics Repairman	2	0
07	68EXX	Rotor Repairman	2	0

CH-47C Existing Maintenance Concept

Table VIII identifies scheduled maintenance requirements, inspection requirements, and mission information data on the baseline CH-47C mission. It can be seen from this table that TBO levels vary from 300 hours on the engine to 2400 hours on certain elements of the shaft assembly. The inspection concept calls for the performance of the daily inspection after the last flight of the day or preceding the first flight of the next day, an intermediate inspection performed in 25-hour increments, and a periodic inspection performed every 100 hours. Preflight and postflight inspections are not performed by the maintenance crew and are therefore not chargeable to maintenance. These inspections are merely walkaround safety-of-flight inspections performed by the pilot, copilot, or crew chief before and after flight.

CH-47C Maintenance Concept - Alternate A

This simulated maintenance concept shown in Table IX is based upon the presently considered baseline mission and maintenance concept for the Heavy Lift Helicopter. The scheduled maintenance concept for the aircraft requires all components to be operated on condition. The inspection concept requires: (1) a firm inspection which can be considered analogous to the daily inspections of the CH-47C baseline mission except in terms of duration and content of those things inspected; (2) a 10-hour inspection performed in conjunction with the firm inspection which covers those areas previously considered performed in the daily inspection; and (3), the Phased Periodic Inspection (PPI) which is performed every 50 hours. In performing the various phases of the periodic inspection, the aircraft is divided into six independent areas, all of which require essentially the same elapsed maintenance look-phase time. After six sequential phases of inspection, the total periodic maintenance inspection has been completed. Due to some

TABLE VIII. BASIC CH-47C MAINTENANCE CONCEPT (BASED ON EXISTING MAINTENANCE POLICY)

A. Scheduled Maintenance				
Component	P/N	TBO	Retirement Interval	
Forward transmission	114D1200-5	1200	N/A	
Aft transmission	114D2200-7	1200	N/A	
Engine combining transmission	114D5200-2	1200	N/A	
Engine mechanical transmission (2)	114D6200-4	1200	N/A	
Aft rotary wing drive shaft	114D3250-1	1800	3600	
Sync shaft assembly	All Appl.	2400	N/A	
Sync shaft adapter	114D3241-1	2400	N/A	
Engine drive shaft assembly	114D3067-3	2400	N/A	
Forward rotary wing head	114D3247-1	2400	N/A	
Aft rotary wing head	114R2003-3	1200	N/A	
Forward swashplate assembly	114R2004-4	1200	N/A	
Aft swashplate assembly	114R3508-8	1200	N/A	
Forward rotor blades (3)	114R3505-11, -12	1200	N/A	
Aft rotor blades (3)	114R1502-33	N/A	6000	
Engine	114R1502-34	N/A	4000	
	T-55-L-11	300	N/A	
B. Inspections				
Type	Crew & Elapsed Time	When Accomplished	Description	Rationale
(1) Daily	2 men 2.37 hours	After the last flight of the day or preceding the next day's first flight	Consists of visual examination and operational checks to determine that the aircraft can safely and efficiently perform its assigned mission	Scheduled inspections are required in order to assure that latent defects are discovered and corrected before malfunctioning or serious trouble results
(2) Intermediate	3.5 men 3.44 hours	Every 25, 50, and 75 flying hours after completion of the periodic inspection	Provides verification of satisfactory functioning at frequencies between the daily and periodic inspections	Same as daily
(3) Periodic	6 men 7.55 hours	Every 100 flying hours	A comprehensive, thorough, and searching inspection of all items which are subject to adjustment, discrepancies, or failures	Same as daily

TABLE IX. CH-47C MAINTENANCE CONCEPT - ALTERNATE A (BASED ON PROPOSED HELI MAINTENANCE CONCEPT)

A. Scheduled Maintenance				
None - All components are replaced "on condition".				
B. Inspections				
Type	Crew & Elapsed Time	When Accomplished	Description	Rationale
(1) Flight inspection requirement minimum (firm)	2 men 12 min	After each flying day	Minimum safety of flight inspection which supplants present daily inspection. Only items directly related to safety of flight are considered.	Historical CH-47C DATA has shown that many of the items on the daily checklist rarely fail. This inspection would cover only those things critical to safety of flight. Reduced maintenance by extending the inspection interval of non "flight critical" items.
(2) Ten-hour inspection	2.5 men 3.5 hours	Each 10 flight hours in conjunction with the firm	Covers those areas previously included in the conventional daily inspection that are not classified as "flight critical".	
(3) Phased Periodic Inspection (PPI)	2.5 men 7 hours for each phase	Progressive phases - every 50 flight hours	The PPI will be divided into 6 phases, each of which will be performed every 50 flight hours. A full inspection will be completed in 300 flight hours, at which time another cycle will be initiated.	Improvements in inspection methods and reliability will reduce the need for "look phase" inspection and increase the interval between periodic inspections. This concept permits the aircraft to be removed from flight status for shorter periods of time during anticipated downtime periods, permitting efficient flight scheduling, improved personnel utilization and increased availability. Deferred maintenance accrual is attenuated, if not completely eliminated.

limitations of the existing form of the R&M simulation model, the application of this maintenance concept is slightly biased; that is, at each phase of the PPI, it is assumed that every item of the aircraft is capable of being observed as a failure, rather than just those items that would be normally covered in that look-phase of the periodic inspection. It is felt, however, that due to the manner in which the six phases of the periodic inspection would be constructed, the bias injected by performing the analysis is minimal. Again, as in the case of the baseline mission, preflight inspections are not chargeable to maintenance.

CH-47C Maintenance Concept - Alternate B

This concept shown in Table X represents an adaptation of the Navy maintenance concept for supporting a CH-46 to an Army CH-47C maintenance concept. Scheduled maintenance of dynamic components consists of TBO levels varying from 1200 hours for transmissions to 2400 hours for the engine and certain elements of the sync-shaft assembly. The inspection concept consists of, (1) a turnaround inspection performed prior to each flight of the day and after the last flight of the day, which is essentially a combination of preflight and postflight inspections, (2) a daily inspection performed prior to the first flight of the day, and (3) a calendar periodic inspection performed at 34-week intervals. The interesting point of differentiation between this concept and the existing maintenance concept is that the periodic inspection is not aircraft-clock oriented, but rather calendar-time oriented. Incorporation of this maintenance concept into the comparative analyses, which will be discussed in detail later, required certain areas of modification to the model to enable evaluation of periodic inspection requirements based on the calendar rather than clock-time orientation.

CH-47C Maintenance Concept - Alternate C

This concept depicted in Table XI represents the adaptation of an Air Force H-3 maintenance concept to an Army CH-47C application. All components are to be replaced on condition; that is, there is no scheduled removal of dynamic components. The inspection concept consists of a preflight inspection, performed prior to each flight of the day, a postflight, performed after each flight of the day, and a phased periodic inspection, performed at 100 flying hour intervals. The major distinction between this alternate maintenance concept and the baseline and other alternate maintenance concepts is the replacement of the daily inspection with the postflight inspection performed after each flight, not just after the last flight of the day.

TABLE X. CH-47C MAINTENANCE CONCEPT - ALTERNATE B (BASED ON UH CH-46 MAINTENANCE CONCEPT)

A. Scheduled Maintenance				
Component	P/N	TBO	Retirement Interval	
Forward transmission	114D1200-5	1200	N/A	
Aft transmission	114D1200-7	1200	N/A	
Engine combining transmission	114D5200-2	1200	N/A	
Engine mechanical transmission	114D6200-4	1200	N/A	
Aft rotary wing drive shaft	114D3250-1	1800	3600	
Sync shaft assembly	All Appl. P/N's	2400	N/A	
Sync shaft adapter	114D3243-1	2400	N/A	
Sync shaft adapter	114D3047-3	2400	N/A	
Engine drive shaft assembly	114D3247-1	2400	N/A	
Forward rotary wing head	114R2003-3	1200	N/A	
Aft rotary wing head	114R2004-4	1200	N/A	
Forward washplate assembly	114R3508-8	1200	N/A	
Aft washplate assembly	114R3505-11, -12	1200	N/A	
Forward rotor blades	114R1502-33	N/A	600	
Aft rotor blades	114R1502-34	N/A	4000	
Engine	T-55-L-11	2400	N/A	
B. Inspections				
Type	Crew & Elapsed Time	When Accomplished	Description	Rationale
(1) Turnaround/servicing	1 man 20 min	Prior to each flight and after last flight	Primarily a visual inspection to determine obvious defects between flights, degradation that may have occurred during flight and the required servicing	Purpose of the turnaround inspection is to reduce downtime between flights. It contains the minimum requirements to insure the integrity of the aircraft for flight
(2) Daily	2 men 60 min	Prior to the first flight of the day	These requirements are to inspect for latent defects at a greater depth than performed in the turnaround	Purpose is to determine degradation and to insure the aircraft is safe for flight
(3) Calendar-periodic (airframe)	9 men 13 hours	At 34-week intervals	A thorough and detailed inspection of the complete aircraft to inspect for material degradation that may have occurred during the preceding calendar period and to perform essential preventive maintenance	Calendar concept permits more efficient scheduling of aircraft operations and maintenance, thereby improving aircraft availability

TABLE XI. CH-47C MAINTENANCE CONCEPT - ALTERNATE C (BASED ON USAF H-3 MAINTENANCE CONCEPT)

A. Scheduled Maintenance: None - All components are replaced "on condition".

B. Inspections

Type	Crew & Elapsed Time	When Accomplished	Description
(1) Preflight	2 men 30 min	Prior to each flight	Inspection consists of checking the helicopter for flight preparedness by performing visual examination and operational checks of certain components to assure no defects or maladjustments exist that could cause accidents or aborted missions
(2) Postflight	2 men 20 min	After each flight	Inspection consists of checking the helicopter to determine if it is suitable for another flight by performing visual examination of certain components, areas or systems to assure no defects exist which would be detrimental to further flight
(3) Phased inspection	3 men 3.5 hours	Every 100 flying hours	The complete inspection cycle for the weapon system is assumed to be 1200 hours. A portion of the total recurring inspection requirements is accomplished at each phased inspection. Certain items are considered basic phase requirements and will be accomplished in conjunction with each phase (100 flying hours) inspection. The inspection cycle will be repeated, starting with phase number one, 100 hours after completion of the 12th phased inspection. Included in each phased inspection are requirements for checking certain components, areas or systems of the helicopter to determine that no condition exists which, if not corrected, could result in failure or malfunction of the component prior to the next scheduled inspection

CH-47C Maintenance Concept - Alternate D

The final alternate CH-47C maintenance concept shown in Table XII is a modification of a Navy UH1E maintenance concept to an Army CH-47C application. TBO levels on dynamic components range from 2000 hours on the transmissions to 2400 hours on the engines. The inspection concept calls for a preflight inspection before each flight, a postflight after each flight, a daily inspection performed prior to the first flight of the day in conjunction with the preflight, and a calendar periodic inspection performed at 17-week intervals. This inspection concept, therefore, combines various elements of several of the previously defined maintenance concepts.

HLH MAINTENANCE CONCEPT

Each of the five maintenance concepts defined for the heavy-lift helicopter is basically similar to those previously discussed for the CH-47C helicopter. The variations between HLH maintenance concepts and those for the CH-47C are the look-phase maintenance time required to perform the various elemental inspections for the maintenance concepts. Tables XIII through XVII identify the scheduled inspection requirements for the various dynamic components of the HLH aircraft in the various maintenance concepts, and the duration and number of men required to perform the look-phase of the various inspection types. Therefore, rather than duplicate the previous discussion, Table XVIII has been developed to show the correlation between the CH-47C and HLH maintenance concepts. Table XVIII presents a method of utilizing these discussions and relating them to the maintenance concepts depicted in Tables XIII through XVII.

For all runs of the HLH comparative analysis, two 8-hour maintenance shifts have been employed. The personnel allocations for each shift, in terms of quantities and distribution, have been developed by Boeing Vertol Maintainability personnel. The specific personnel quantities by skill code employed in this analysis are shown below.

Skill Code	Comparable Army Maintenance Nomenclature	Shift 1 Quantity	Shift 2 Quantity
01	General Mechanic - Organizational	13	11
02	General Mechanic - Integrated Direct Support	6	6

TABLE XII. CH-47C MAINTENANCE CONCEPT - ALTERNATE D (BASED ON USN UH-1E MAINTENANCE CONCEPT)

A. Scheduled Maintenance				
Component	TBO	Retirement Interval		
Forward transmission	2000	N/A		
Aft transmission	2000	N/A		
Engine combining transmission	2000	N/A		
Engine mechanical transmission	2000	N/A		
Aft rotary wing drive shaft	2000	4000		
Sync shaft assembly	2400	N/A		
Sync shaft adapter	2400	N/A		
Engine drive shaft assembly	2400	N/A		
Forward rotary wing head	2000	N/A		
Aft rotary wing head	2000	N/A		
Forward swashplate assembly	2000	N/A		
Aft swashplate assembly	2000	N/A		
Forward rotor blades	N/A	6000		
Aft rotor blades	N/A	4000		
Engine	2400	N/A		
B. Inspections				
Type	Crew	Elapsed Time	When Accomplished	Description
(1) Preflight	2 men	20 min	Prior to each flight	This inspection is to verify proper servicing and to inspect for obvious defects
(2) Postflight	2 men	20 min	After each flight	This inspection required to determine obvious degradation that may have occurred during flight and required servicing
(3) Daily	2 men	60 min	Prior to the first flight of the day. No more than 72 hours may elapse between such accomplishment and the following flight. The accomplishment of these requirements immediately prior to flight shall satisfy the requirements of a pre-flight inspection	This inspection required to inspect for latent defects at a greater depth than performed in the preflight and postflight inspection; to determine degradation and to insure the aircraft is safe for flight
(4) Calendar periodic	9 men	10 hours	At 17-week intervals	These requirements are to inspect the aircraft for material degradation that may have occurred during the preceding calendar and to perform essential preventive maintenance

TABLE XIII. BASIC HLH MAINTENANCE CONCEPT (BASED ON PROPOSED HLH MAINTENANCE CONCEPT)

A. Scheduled Maintenance: None - All components are replaced "on condition".				
B. Inspections				
Type	Crew & Elapsed Time	When Accomplished	Description	Rationale
(1) Flight Inspection Requirement Minimum (FIRM)	2 men 15 min	After each flying day	Minimum safety-of-flight inspection which supplants present daily inspection. Only items directly related to safety-of-flight are considered	Incorporation of diagnostics and improved reliability eliminates the conventional daily inspection
(2) Ten-hour inspection	2.5 men 4 hours	Each 10 flight hours in conjunction with the FIRM	Covers those areas previously included in the conventional daily inspection that are not classified as "flight critical" for the HLH	Reduce maintenance by extending the inspection interval of non-flight critical items. Anticipated frequency would be every other flying day based on a utilization rate of 4 hours per day
(3) Phased Periodic Inspection (PPI)	2.5 men 8 hours for each phase	Progressive phases every 50 flight hours	The PPI will be divided into 12 phases, each of which will be performed every 50 flight hours. A full inspection cycle will be completed in 600 flight hours, at which time another cycle will be initiated	Significant state-of-the-art attainments affecting reliability and inspection methods will reduce the need for look-phase inspection and will substantially increase the interval between periodic inspections. The advantages in this concept are that the aircraft is removed from flight status for shorter periods of time during anticipated downtime periods, permitting efficient flight scheduling, improved personnel utilization and increased availability. Deferred maintenance accrual is attenuated, if not completely eliminated

TABLE XIV. HLM MAINTENANCE CONCEPT - ALTERNATE A (BASED ON EXISTING CH-47C MAINTENANCE CONCEPT)

A. Scheduled Maintenance			
Component	TBO		
Forward rotor transmission	1200		
Combining transmission	1200		
Aft rotor transmission	1200		
Sync shafting (6 sections)	2400		
Slant shaft (2 sections)	2400		
Engine drive shafts (6 sections)	2400		
Forward rotor hub	1200		
Aft rotor hub	1200		
Forward rotor blades	on condition		
Aft rotor blades	on condition		
Forward swashplate	1200		
Aft swashplate	1200		
Engine	500		
B. Inspections			
Type	Crew	Elapsed Time	When Accomplished
(1) Daily	2 men	3.0 hours	After the last flight of the day or preceding the next days flight
(2) Intermediate	4 men	4 hours	Every 25, 50 and 75 flying hours after completion of the periodic inspection
(3) Periodic	8 men	8 hours	Every 100 flying hours
			Description
			Consists of visual examination and operational checks to determine that the aircraft can safely and efficiently perform its assigned mission
			Provide verification of satisfactory functioning at frequencies between the daily and periodic inspections
			A comprehensive, thorough, and searching inspection of all items which are subject to adjustment, discrepancies, or failures
			Rationale
			Scheduled inspections are required in order to assure that latent defects are discovered and corrected before malfunctioning or serious trouble result
			Same as daily
			Same as daily

TABLE XV. H/LH MAINTENANCE CONCEPT - ALTERNATE B (BASED ON USN CH-46 MAINTENANCE CONCEPT)

A. Scheduled Maintenance				
Component	TBO			
Forward rotor transmission	1200			
Combining transmission	1200			
Aft rotor transmission	1200			
Sync shafting (6 sections)	2400			
Slant shaft (2 sections)	2400			
Engine drive shafts (6 sections)	2400			
Forward rotor hub	1200			
Aft rotor hub	1200			
Forward rotor blades	on condition			
Aft rotor blades	on condition			
Forward swashplate	1200			
Aft swashplate	1200			
Engine	2400			
B. Inspections				
Type	Crew & Elapsed Time	When Accomplished	Description	Rationale
(1) Turnaround/servicing	2 men 15 min	Prior to each flight and after last flight	Primarily, a visual inspection to determine obvious defects between flights, degradation that may have occurred during flight and the required servicing	Purpose of the turnaround inspection is to reduce downtime between flights. It contains the minimum requirements to insure the integrity of the aircraft for flight.
(2) Daily	2 men 75 min	Prior to the first flight of the day	These requirements are to inspect for latent defects at a greater depth than performed in the turnaround	Purpose is to determine degradation and to insure the aircraft is safe for flight
(3) Calendar-periodic (airframe)	10 men 15 hours	At 34-week intervals	A thorough and detailed inspection of the complete aircraft to inspect for material degradation that may have occurred during the preceding calendar period and to perform essential preventive maintenance	Calendar concept permits more efficient scheduling of aircraft operations and maintenance, thereby improving aircraft availability

TABLE XVI. HUH MAINTENANCE CONCEPT - ALTERNATE C (BASED ON USAF H-3 MAINTENANCE CONCEPT)

A. Scheduled Maintenance: None - All components are replaced "on condition".			
B. Inspections			
Type	Crew & Elapsed Time	When Accomplished	Description
(1) Preflight	2 men 50 min	Prior to each flight of the day	Inspection consists of checking the helicopter for flight preparedness by performing visual examination and operational checks of certain components to assure no defects or maladjustments exist that could cause accidents or aborted missions
(2) Postflight	2 men 30 min	After each flight	Inspection consists of checking the helicopter to determine if it is suitable for another flight by performing visual examination of certain components, areas or systems to assure no defects exist which would be detrimental to further flight
(3) Phased inspection	3 men 4 hours	Every 100 flying hours	The complete inspection cycle for the weapon system is assumed to be 1200 hours. A portion of the total recurring inspection requirements is accomplished at each phased inspection. Certain items are considered basic phase requirements and will be accomplished in conjunction with each phase (100 flying hours) inspection. The inspection cycle will be repeated, starting with phase number one, 100 hours after completion of the 12th phased inspection. Included in each phased inspection are requirements for checking certain components, areas or systems of the helicopter to determine that no condition exists which, if not corrected, could result in failure or malfunction of the component prior to the next scheduled inspection

TABLE XVII. NHM MAINTENANCE CONCEPT - ALTERNATE D (BASED ON USN UH-1E MAINTENANCE CONCEPT)

A. Scheduled Maintenance			
Component	TBO		
Forward rotor transmission	2000		
Combining transmission	2000		
Aft rotor transmission	2000		
Sync shafting (6 sections)	3000		
Slant shaft (2 sections)	3000		
Engine drive shafts (6 sections)	3000		
Forward rotor hub	2000		
Aft rotor hub	2000		
Forward rotor blades	on condition		
Aft rotor blades	on condition		
Forward swashplate	2000		
Aft swashplate	2000		
Engine	2400		
B. Inspections			
Type	Crew & Elapsed time	When Accomplished	Description
(1) Preflight	2 men 30 min	Prior to each flight	This inspection is to verify proper servicing and to inspect for obvious defects
(2) Postflight	2 men 30 min	After each flight	This inspection required to determine obvious degradation that may have occurred during flight, and required servicing.
(3) Daily	2 men 70 min	Prior to the first flight of the day. No more than 72 hours may elapse between such accomplishment and the following flight. The accomplishment of these requirements immediately prior to flight shall satisfy the requirements of a preflight inspection	This inspection required to inspect for latent defects at a greater depth than performed in the preflight or postflight inspections; to determine degradation and to insure the aircraft is safe for flight
(4) Calendar periodic	10 men 12 hours	At 17-week intervals	These requirements are to inspect the aircraft for material degradation that may have occurred during the preceding calendar and to perform essential preventive maintenance

**TABLE XVIII. RELATIONSHIP OF CH-47C MAINTENANCE CONCEPTS
TO HLH MAINTENANCE CONCEPTS**

CH-47C Maintenance Concept	Analagous HLH Maintenance Concept
Basic (Current CH-47C)	Alternate A (Proposed HLH)
Alternate A (Proposed HLH)	Basic (Current CH-47C)
Alternate B (USN CH-46)	Alternate B (USN CH-46)
Alternate C (USAF H-3)	Alternate C (USAF H-3)
Alternate D (USN UH-1E)	Alternate D (USN UH-1E)

Conclusion

The CH-47C and HLH maintenance concepts are discussed further in a subsequent section of the report, dealing with the comparative analysis of these various missions and maintenance concepts. The various maintenance concepts and missions selected for comparative analysis coded in GPSS for inclusion in the model are presented in Appendix II.

MODEL VALIDATION

INTRODUCTION

There are two fundamental approaches employed in validating a simulation model--first, employ the model to simulate a system operation, and operate the actual system in its real environment and evaluate the comparable predicted versus achieved results. Although this is the most rigorous proof of model validity, it is generally too expensive to employ on large, complex simulations such as the R&M model. Furthermore, it is impossible in the case of the HLH, since this is a conceptual aircraft.

The second method of validation is to construct a relatively limited mathematical model which identifies the significant system interactions and can, therefore, be used to make predictions of system performance against which the simulated results can be compared. The major problem encountered employing this approach toward validating the R&M model is that there has been little success in developing a deterministic model which has adequately considered the significant interactions involved in the operations and maintenance of an aircraft fleet.

Thus, it has been necessary to employ a different approach to model validation in this analysis. The primary elements of model validation as employed in this study are the calculation of expected values for those parameters which are essentially independent stochastic variables and the identification of trends generated by parametric sensitivity analyses.

One of the major problems in calculating expected values for parameters of the R&M simulation model is the extreme difficulty of estimating the impact of queuing upon parametric values. Thus, to minimize queuing (and consequently its impact), essentially unlimited spares and personnel were employed for the initial baseline validation runs. When it was concluded that the model output was acceptably correlated to the expected values in this unlimited case, the storage definitions were redefined to impose the restriction of a true TO&E upon the model operation. Various sensitivity runs were then made to ensure that the model response to parametric input variations was not counter-intuitive. Finally, the comparative analyses performed for the various mission/maintenance concept combinations provided further reinforcement of the validity and flexibility of the basic model logic.

BURN-IN ANALYSIS

Evaluating model achievement of stability is a process unique to each simulation model and its intended application. That is, a system has achieved a homeostatic condition when the major parameters by which the system performance is measured have reached a morphologically unchanging state.

The time it takes to reach this homeostatic state for the R&M simulation model is functionally dependent upon the number of transactions endogenous to the model. With the HLH and CH-47C models, the platoon size, monthly utilization, and maintenance action rates for the baseline scenarios are of sufficient magnitude to ensure stable operation in a 56-day simulation. Furthermore, stability is monitored in terms of the primary measures of effectiveness for this analysis which are availability (UPTIME/TOTAL TIME) and mission completion ratio (MISSIONS FLOWN/MISSIONS SCHEDULED). Table XIX shows several of the pertinent output parameters generated for the HLH over various simulated durations. Tables XX, XXI, and XXII display the output statistics generated for various time frames of simulated CH-47C operation, with various levels of maintenance personnel support.

Figure 9 shows the effect of run duration upon availability for the various burn-in runs that were made. These data support the conclusion that 56 days is adequate for the HLH and CH-47C baseline models.

It should be noted, however, that if future analysis were to consist of a significantly lower number of transactions or different (more refined) measures of effectiveness, the 56-day run duration might not be adequate to generate stable and, thus, statistically significant, results.

MODEL VALIDATION - HLH

Table XXIII identifies the expected values and baseline output statistics for 17 selected output parameters. A review of the output statistics shows an intuitively acceptable relationship between the quantitative values generated by the baseline model and the expected values. Furthermore, it can be seen that the distribution of error appears to be random with 59 percent of the output statistics greater than expected and 41 percent of the statistics less than or equal to expected.

Thus, the baseline model fulfills the first criterion of validation employed in this analysis; namely, morphological equivalence between output and expected statistics.

TABLE XIX. HLH BURN-IN ANALYSIS
(Standard 36 Man TOE)

OUTPUT PARAMETERS	RUN DURATION - MONTHS			
	1	2	3	5
TOTAL NUMBER OF MISSIONS FLOWN	120	244	492	736
TOTAL NUMBER OF MISSIONS CALLED	126	252	504	756
TOTAL UTILIZATION*	240	488	984	1472
TOTAL NUMBER OF DAILY INSP.	95	185	294	555
TOTAL NUMBER OF PMI INSP.	24	45	88	129
TOTAL NUMBER OF PMP INSP.	4	11	20	30
TOTAL DAILY MMH	57.0	111.0	176.4	330.0
TOTAL PMI MMH	240.0	450.0	880.0	1290.0
TOTAL PMP MMH	80.0	220.0	400.0	600.0
TOTAL UNS MAINT ACTIONS	270	566	987	1559
TOTAL UNS MMH	1321.5	2226.0	3971.0	6367.5
TOTAL SCH MMH	377.0	781.0	1456.4	2223.0
TOTAL UNS EMT	357.7	600.3	1186.4	1780.8
TOTAL SCH EMT	250.1	484.5	1011.9	1471.2
TOTAL MMH/FH	6.74	5.82	5.25	5.56
NORM DELAY	607.8	1084.8	2198.3	3258.0
TOTAL AIR ABORTS	4	6	12	15
# MAINT ACTIONS - INFLT. ABORT	4	6	14	16
# MAINT ACTIONS INFLT.	14	30	41	77
# MAINT ACTIONS DURING PMI	148	265	470	719
# MAINT ACTIONS AT DAILY	30	58	103	174
# MAINT ACTIONS AT PMP	74	207	359	573
MAHF/FH	1.12	1.16	1.00	1.02
AVAILABILITY	79.9	82.06	81.85	82.05
*Total Mission Flight Hours Excluding Test Hops and Aborted Missions				

TABLE XX. CH-47 BURN-IN ANALYSIS
(UNLIMITED MEN)

OUTPUT PARAMETERS	RUN DURATION - MONTHS				
	1	2	3	4	5
TOTAL NUMBER OF MISSIONS FLOWN	702	1391	2092	2802	3492
TOTAL NUMBER OF MISSIONS CALLED	756	1512	2268	3024	3780
TOTAL UTILIZATION	1053	2086.5	3138.0	4201.0	5238.0
TOTAL NUMBER OF DAILY INSP	289	577	868	1159	1440
TOTAL NUMBER OF PMI INSP	35	72	103	133	170
TOTAL NUMBER OF PMP INSP	13	20	33	45	56
TOTAL DAILY MMH	1387.2	2769.6	4166.4	5563.2	6912.0
TOTAL PMI MMH	416.5	856.90	1225.7	1582.7	2023.0
TOTAL PMP MMH	585.0	900.00	1485.0	2025.0	2520.0
TOTAL UNS MAINT ACTIONS	1966	3458	5303	7045	8761
TOTAL UNS MMH	2514.65	4463.99	6983.74	9536.68	11811.05
TOTAL SCH MMH	2946.88	4599.01	7130.32	9458.55	11618.13
TOTAL UNS EMT	981.0	1948.8	2906.3	3972.1	4865.7
TOTAL SCH EMT	320.5	594.8	898.3	1205.7	1502.7
TOTAL MMH/FH	5.18	4.34	4.50	4.50	4.47
NORM DELAY	1301.5	2543.6	3804.6	5177.8	6368.4
TOTAL AIR ABORTS	31	72	105	126	164
# MAINT ACTIONS - INFLT ABORT	31	DATA	110	132	171
# MAINT ACTIONS INFLT	47	NOT	120	156	202
# MAINT ACTIONS DURING PMI	242	AVAILABLE	688	891	1130
# MAINT ACTIONS AT DAILY	655		1934	2611	3303
# MAINT ACTIONS AT PMP	991		2391	3255	3955
MAIF/FH	1.8	1.7	1.7	1.7	1.7
AVAILABILITY	87.89	88.17	88.20	87.96	88.15

TABLE XXI. CH-47C BURN-IN ANALYSIS
(108 MAN TOE)

OUTPUT PARAMETERS	RUN DURATION - MONTHS				
	1	2	3	4	5
TOTAL NUMBER OF MISSIONS FLOWN	679	1347	2022	269C	3359
TOTAL NUMBER OF MISSIONS CALLED	756	1512	2268	3024	3780
TOTAL UTILIZATION	1018.5	2020.5	3033.0	4035.0	5038.5
TOTAL NUMBER OF DAILY INSP	278	569	828	1122	1397
TOTAL NUMBER OF PMI INSP	32	65	97	127	160
TOTAL NUMBER OF PMP INSP	14	20	33	44	52
TOTAL DAILY MMH	1334.40	2731.20	3974.4	5385.6	6705.6
TOTAL PMI MMH	380.8	773.5	1154.3	1511.3	1904.0
TOTAL PMP MMH	630.0	900.0	1485.0	1980.0	2340.0
TOTAL UNS MAINT ACTIONS	1993	3325	5086	6573	8296
TOTAL UNS MMH	2474.14	4380.47	6920.42	9030.59	11353.03
TOTAL SCH MMH	2793.45	4461.00	6809.00	9216.00	11183.00
TOTAL UNS EMT	2001.0	4136.9	6563.2	8614.0	10885.2
TOTAL SCH EMT	389.3	678.0	1082.4	1351.2	1645.4
TOTAL MMH/FH	5.17	4.38	4.53	4.52	4.38
NORM DELAY					
TOTAL AIR ABORTS	2390.3	4834.9	7645.6	9965.2	12530.6
	31	71	101	139	178
# MAINT ACTIONS - INFLIGHT ABORT	31	71	103	141	180
# MAINT ACTIONS INFLT	41	86	136	177	226
# MAINT ACTIONS DURING PMI	214	440	629	837	1051
# MAINT ACTIONS AT DAILY	679	1308	1964	2581	3295
# MAINT ACTIONS AT PMP	1028	1420	2254	2837	3544
MAIF/FH	1.8	1.7	1.7	1.6	1.6
AVAILABILITY	77.76	77.51	76.29	76.82	76.69

TABLE XXII. CH-47 BURN-IN ANALYSIS
(STANDARD TOE - 64 MEN)

OUTPUT PARAMETERS	R U N D U R A T I O N - M O N T H S				
	1	2	3	4	5
TOTAL NUMBER OF MISSIONS FLOWN	677	1342	2010	2678	3331
TOTAL NUMBER OF MISSIONS CALLED	756	1512	2268	3024	3780
TOTAL UTILIZATION	1015.5	2051.5	3082.9	4107.9	5115.4
TOTAL NUMBER OF DAILY INSP	277	527	780	1053	1283
TOTAL NUMBER OF PMI INSP	34	65	94	128	158
TOTAL NUMBER OF PMP INSP	11	19	33	42	52
TOTAL DAILY MMH	1329.6	2529.6	3744.0	5054.4	6158.4
TOTAL PMI MMH	404.6	773.5	1118.6	1523.2	1880.2
TOTAL PMP MMH	495.0	855.0	1485.0	1890.0	2340.0
TOTAL UNS MAINT ACTIONS	1675	3137	4981	6415	7961
TOTAL UNS MMH	2107.03	4194.23	6771.26	8702.35	11008.81
TOTAL SCH MMH	2660.75	4563.62	6795.27	8682.01	10537.69
TOTAL UNS EMT	2196.8	5348.2	8361.4	10696.9	14570.4
TOTAL SCH EMT	325.6	682.8	1077.4	1435.9	1711.8
TOTAL MMH/FH	4.51	4.19	4.31	4.15	4.13
NORM DELAY	2522.4	6031.0	9438.8	12132.8	16282.2
TOTAL AIR ABORTS	33	55	98	125	170
* MAINT ACTIONS - INFLT ABORT	34	57	101	135	175
* MAINT ACTIONS INFLT	48	95	138	191	239
* MAINT ACTIONS DURING PMI	202	431	631	849	1044
* MAINT ACTIONS AT DAILY	631	1191	1790	2336	2849
* MAINT ACTIONS AT PMP	760	1363	2321	2904	3654
MALE/FH	1.65	1.53	1.62	1.56	1.56
AVAILABILITY	76.54	71.95	70.73	71.78	69.71

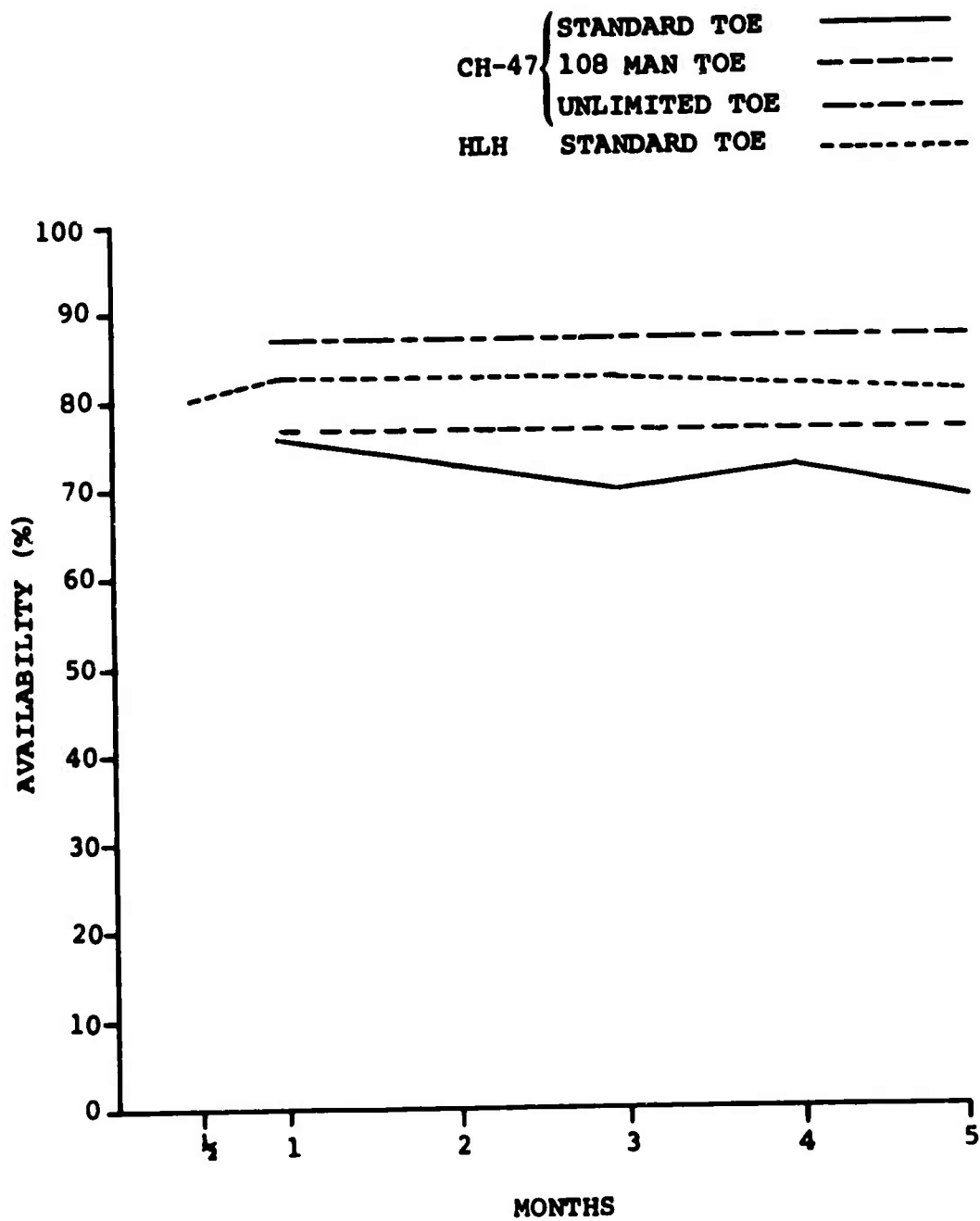


Figure 9. Impact of Run Duration on Availability.

TABLE XXIII. HLF VALIDATION ANALYSIS

<u>OUTPUT PARAMETERS</u>	<u>EXPECTED VALUES</u>	<u>BASELINE OUTPUT</u>
Total number of missions demanded	504	504
Total number of missions completed	494	495
Total utilization	988	990
Total number of daily inspection	less than 504	348
Total number of PMI inspection	80	85
Total number of PMP inspection	20	23
Total daily MMH	less than 302.4	208.8
Total PMI MMH	800	850
Total PMP MMH	400	460
Total unscheduled maintenance actions	1038	1070
Total scheduled MMH	1502.4	1518.8
Total air aborts	10	9
No. Maintenance actions inflight abort	49	46
No. Maintenance actions during PMI	480	460
No. Maintenance actions at daily	less than 151	130
No. Maintenance actions at PMP	400	425
Malfunctions per Flight Hour	1.05	1.08

HLH SENSITIVITY ANALYSIS

The second step in validating the HLH model is to ensure that the model responds to parametric changes in an intuitively acceptable way. The data generated during this analysis is contained in Appendix I. This section identifies several of the trends displayed by this data and discusses their content and implications.

Figure 10 relates the platoon availability (UPTIME/TOTAL TIME) to the unscheduled maintenance action rate. Generally, the relationship between the data and the trend line is quite acceptable. There is however a notable exception identified with ① on the plot.

A review of the data which generated Figure 10 shows that the outlying point is justifiable in an analytical sense. The reason for this excursion is that the point 1 plotted at 67.09-percent availability is a result of the evaluation of model sensitivity to variations in platoon size. Specifically, this point is representative of a platoon size of 3 aircraft attempting to fly the baseline mission normally flown by a platoon of 11 aircraft.

The data plotted in Figure 11, relating direct maintenance man-hours/flight hour to unscheduled maintenance action rate and Figure 12, which shows availability as a function of TOE size, compares quite well to the plotted trends. Since these trends are of the shape generally displayed in the literature, no further discussion of these data appears necessary.

Finally then, it appears, based on the comparison of the baseline results with the expected values and the results of the sensitivity analysis, that the HLH R&M simulation model is, in fact, a valid representation of actual operations and maintenance environments it purports to depict.

MODEL VALIDATION - CH-47C

Table XXIV identifies the expected values and baseline results for 17 selected output parameters. A review of the results versus the parametric expected values confirms the statistical equivalence of results. Furthermore, the distribution of error for the 17 parameters for which expected values could be calculated appears to be random with 44 percent of the deviation positive, and 56 percent of the deviations zero or negative. Thus, it would appear that the CH-47C model passes the first step of validation as defined in this report; namely, the morphological equivalence of model results and expected results.

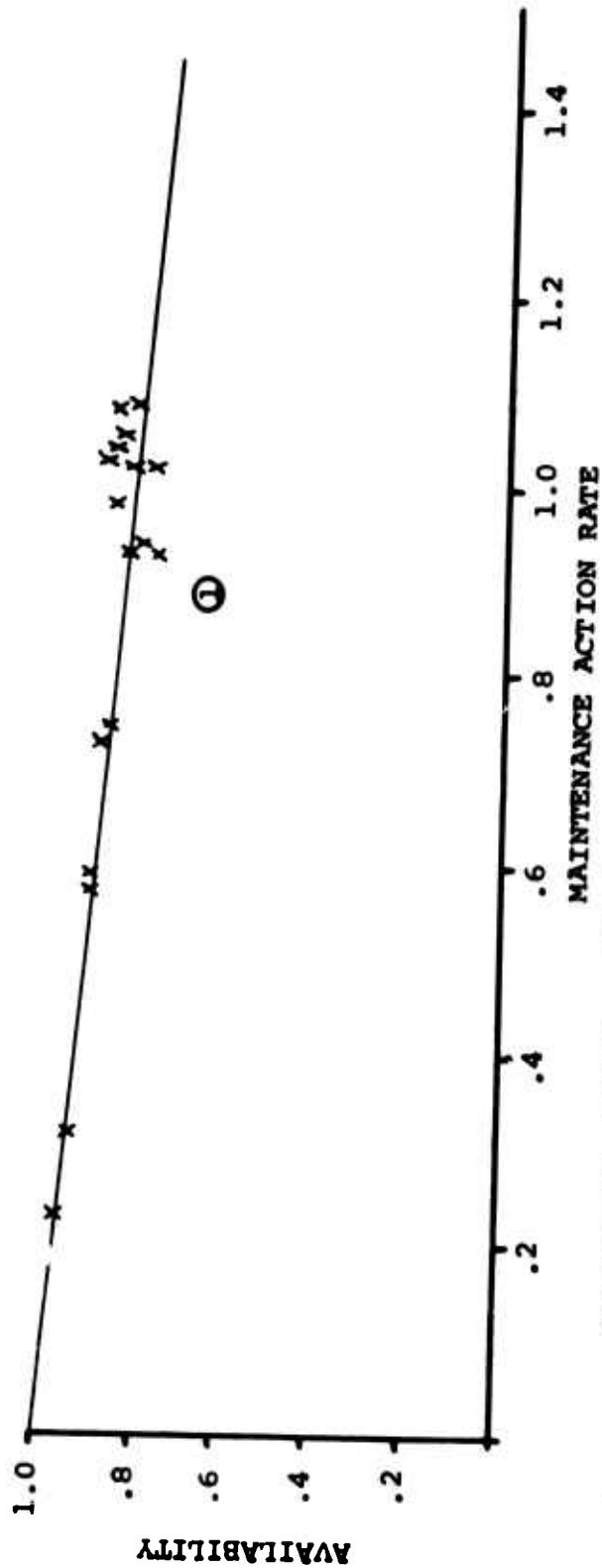


Figure 10. HLH Sensitivity Analyses - Availability Variations.

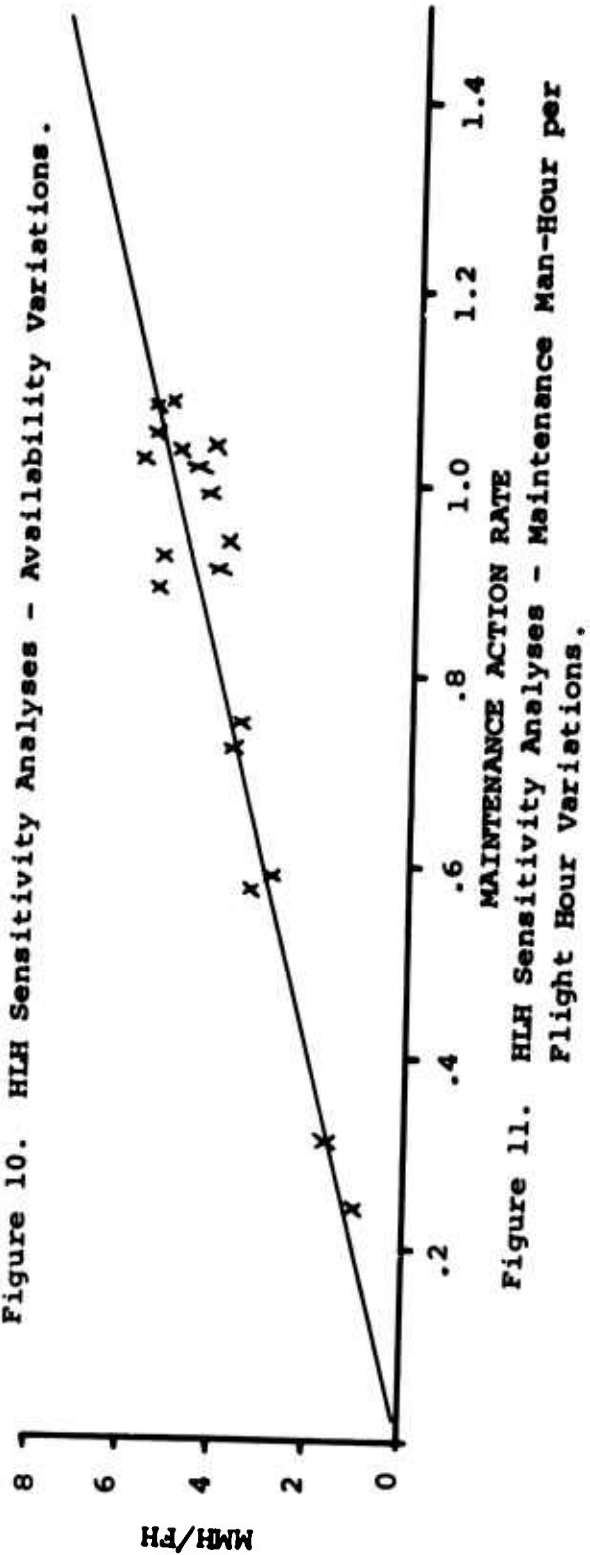


Figure 11. HLH Sensitivity Analyses - Maintenance Man-Hour per Flight Hour Variations.

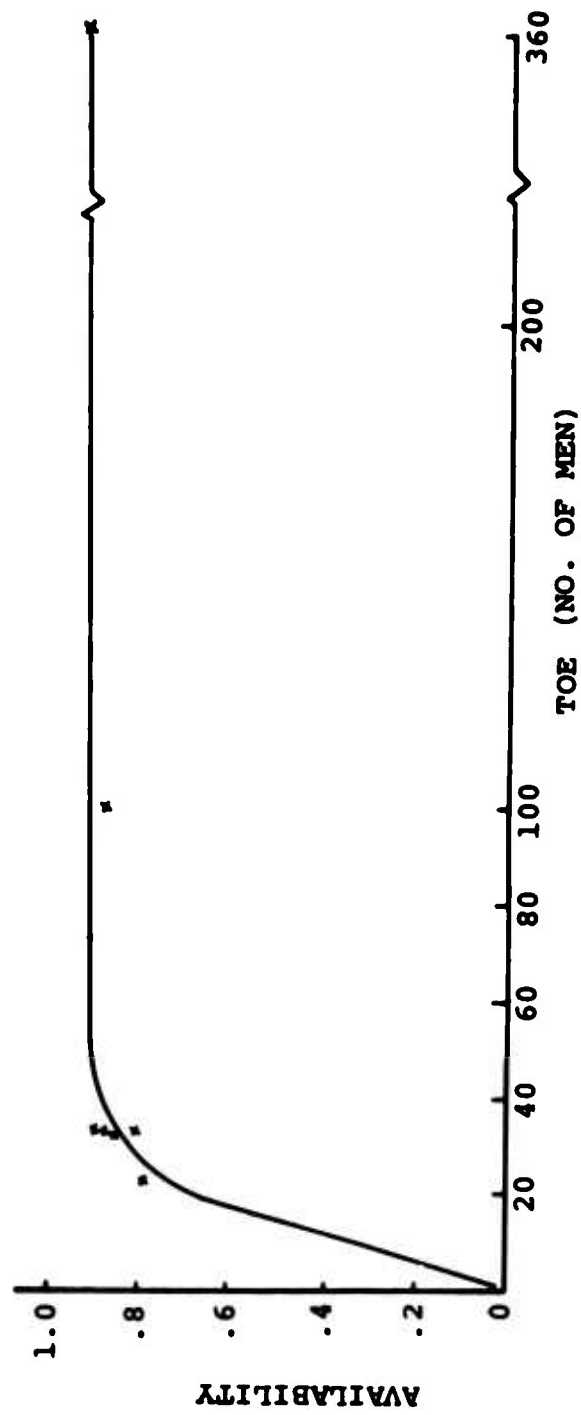


Figure 12. HLH Sensitivity Analyses - Impact of TOE Size Upon Availability.

TABLE XXIV. CH-47C VALIDATION ANALYSIS

<u>OUTPUT PARAMETERS</u>	<u>EXPECTED VALUES</u>	<u>BASELINE OUTPUT</u>
Total number of missions demanded	1512	1512
Total number of missions completed	1426	1372
Total utilization	2139	2058.0
Total number of daily inspection	less than 896	680
Total number of PMI inspection	66	69
Total number of PMP inspection	22	20
Total daily MMH	less than 4300	3264
Total PMI MMH	785.4	821.1
Total PMP MMH	990	900.0
Total unscheduled maintenance actions	2888	2920
Total air aborts	65	66
No. Maintenance actions inflight abort	65	66
No. Maintenance actions inflight	92	95
No. Maintenance actions during PMI	442	473
No. Maintenance actions at daily	less than 1526	853
No. Maintenance actions at PMP	1474	1433
Malfunctions per Flight Hour	1.35	1.42

CH-47C SENSITIVITY ANALYSES

The second step in validating the CH-47C model is to perform several trend analyses which will demonstrate that the model responds to parametric variations in an intuitively acceptable manner.

Figures 13 and 14 show the impact of changes in maintenance action rate upon platoon availability and maintenance man-hours per flight hour, respectively. In both of these figures, there are two distinctly different populations. These populations exhibit the impact of NORS delay upon availability and maintenance man-hours per flight hour. It is obvious that availability must decrease when NORS delays are possible. It is not obvious that maintenance man-hours per flight hour should decrease when NORS delays are encountered. However, after careful review of the data, it is found that the MMH/FH decreases where NORS delays are encountered because less maintenance is being generated, due to the restricted platoon utilization. This is primarily due to the reduced number of periodic inspections encountered during situations of lower utilization. It can be seen, therefore, that the model responds in an intuitively acceptable manner for those cases presented.

This proper response of the model to parametric changes, when combined with the previously discussed statistical equivalence of model results with expected values, constitutes the validation of the CH-47C R&M model.

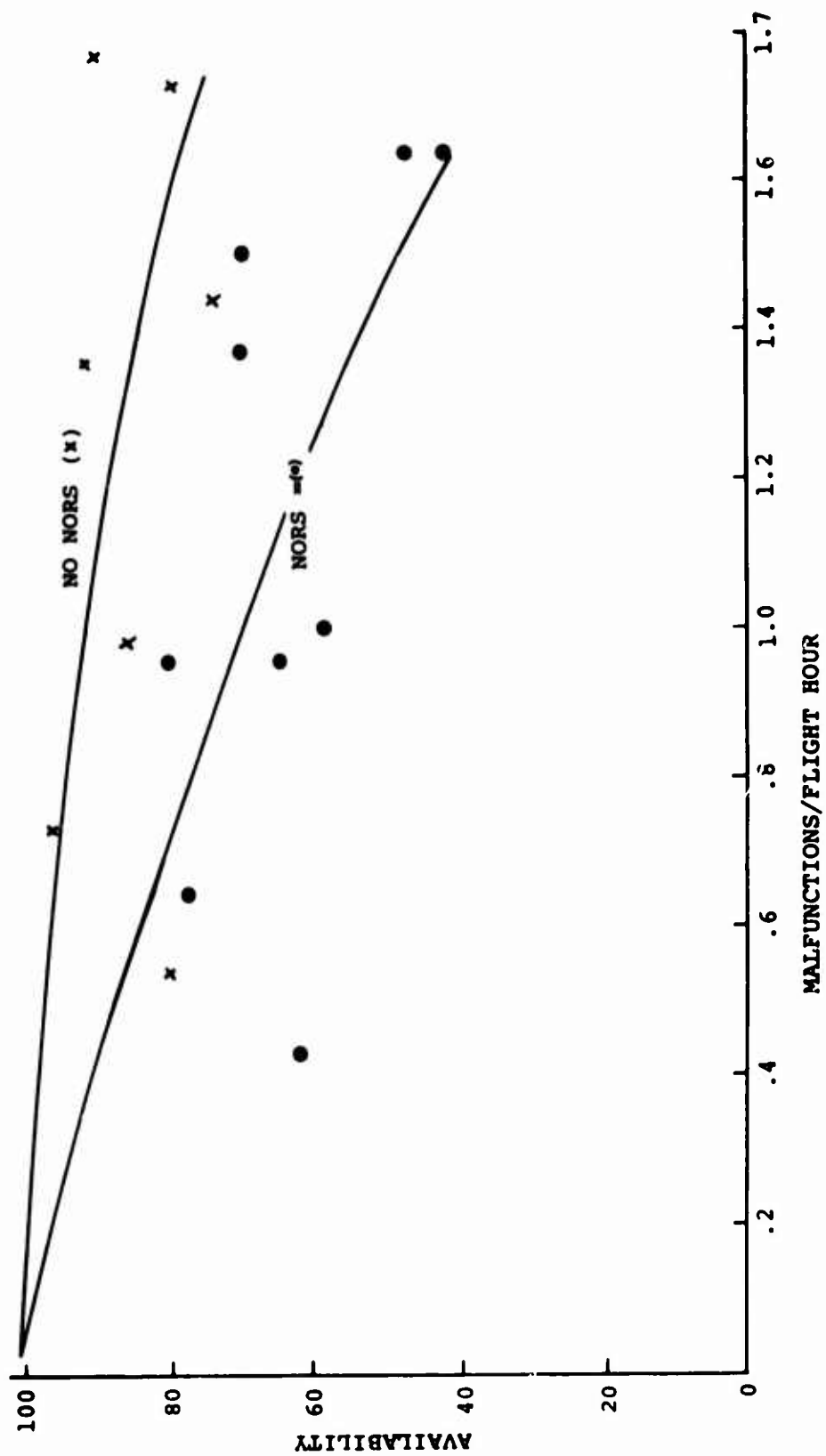
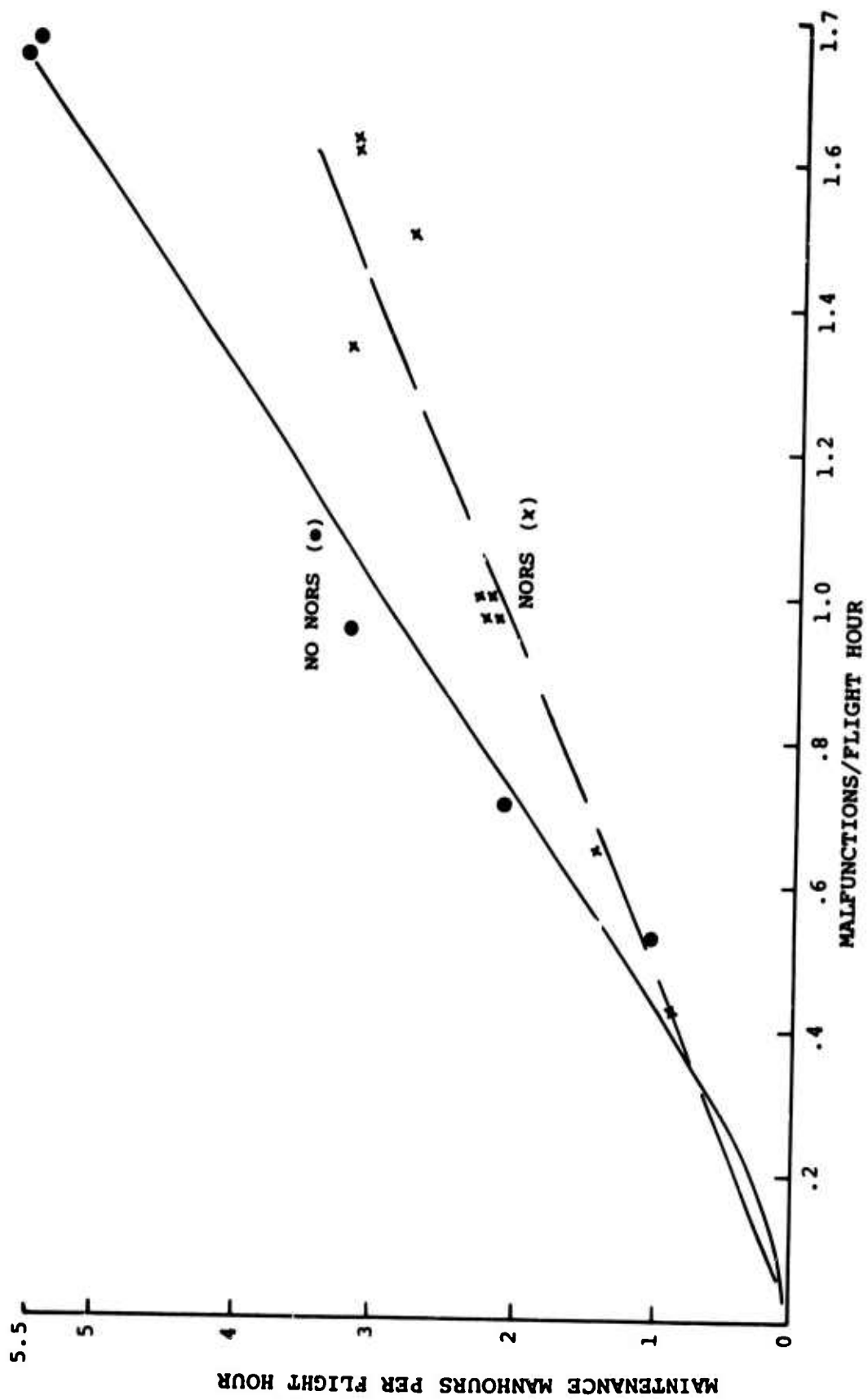


Figure 13. CH-47C Sensitivity Analysis - Availability as a Function of Malfunction Rate.



COMPARATIVE ANALYSIS

INTRODUCTION

In order to demonstrate model validity and flexibility, an analysis was performed, comparing various maintenance concepts over various mission profiles. It was the main intention of this exercise to demonstrate model validity through a simulated maintenance analysis, not to perform a rigorous analysis of each of the maintenance support plan capabilities. As such, the results of these analyses should be considered indicative of the relative merits of each concept, rather than absolute statements of the quantitative differences between the various alternate maintenance concepts.

COMPARATIVE RESULTS

CH-47C

Appendix III contains the results of the twenty cases run during the CH-47C comparative analysis. Table XXV shows the sequence in which the simulations took place.

Figures 15 through 17 identify the types of information that can be extracted from the data contained in Appendix III for the CH-47C.

In preparing the inputs for the various comparative analyses, it is usually necessary to reestimate the occurrence probabilities and maintenance action distributions for the various decision locations within the model. In doing this it is recommended that the method previously discussed in the HLH R&M data section of this report be used.

Whenever the mission/maintenance concept variation is significantly different from the baseline, it may be difficult to estimate the achievable utilization. This is especially the case for surge missions with limited TOE's. Thus, the estimated distribution of inspections, and consequently the maintenance distribution and MALF/FH, rate may not occur as anticipated. In these situations, the alternatives are to redistribute the maintenance actions and rerun the case or to modify the output using a method which will transform the output statistics to a common malfunction rate.

HLH

The results of the 20 cases run during the HLH comparative analysis are contained in Appendix III. Table XXVI identifies the general sequence in which these runs were made. The

TABLE XXV. SELECTION OF CH-47C ALTERNATE MISSIONS AND MAINTENANCE CONCEPTS					
Missions		Logistic Support	CONUS Minimum	Ft. Rucker Lead-The-Fleet	Combat Support Baseline
Maintenance Concepts		180 Hrs/Month	30 Hrs/Month	100 Hrs/Month	54 Hrs/Month
Basic Baseline Daily - End of day PMI - Every 25 hrs PMP - Every 100 hrs 1200-2400 hr TBO's		2	4	3	1
Alternate A Firm - After each day 10 hr inspection Phased PMP On condition		6	14	13	5
Alternate B Turnaround - After each flight Daily - Prior to first flight Calendar - Every 34 weeks 1200-2400 hr TBO's		10	16	15	7
Alternate C Preflight - Prior to first flight Postflight - After each flight Phased PMP - 100 hr intervals On condition		9	17	18	8
Alternate D Preflight Postflight Daily Calendar - 17 week intervals		12	20	19	11

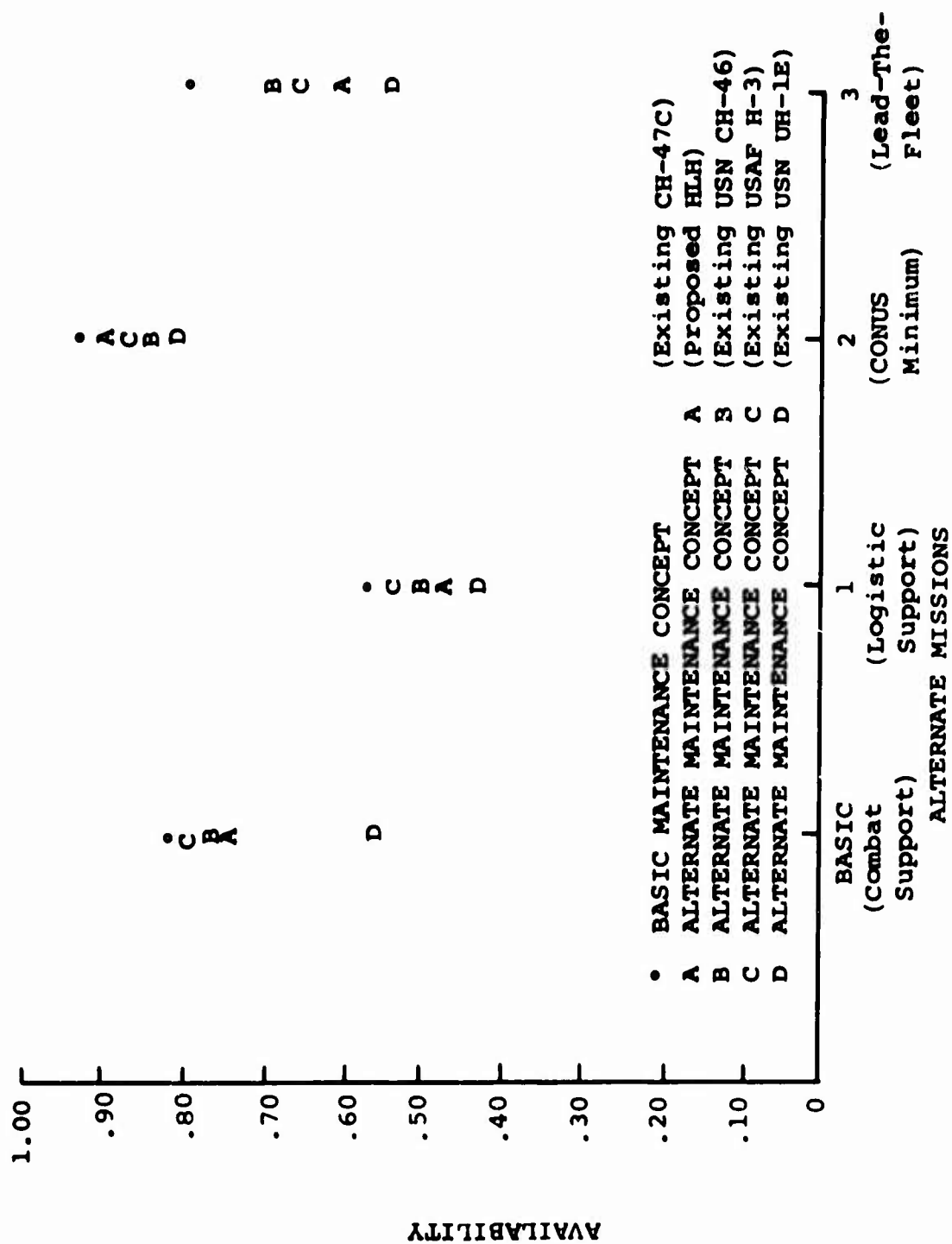


Figure 15. CH-47C Comparative Analysis - Availability Variations.

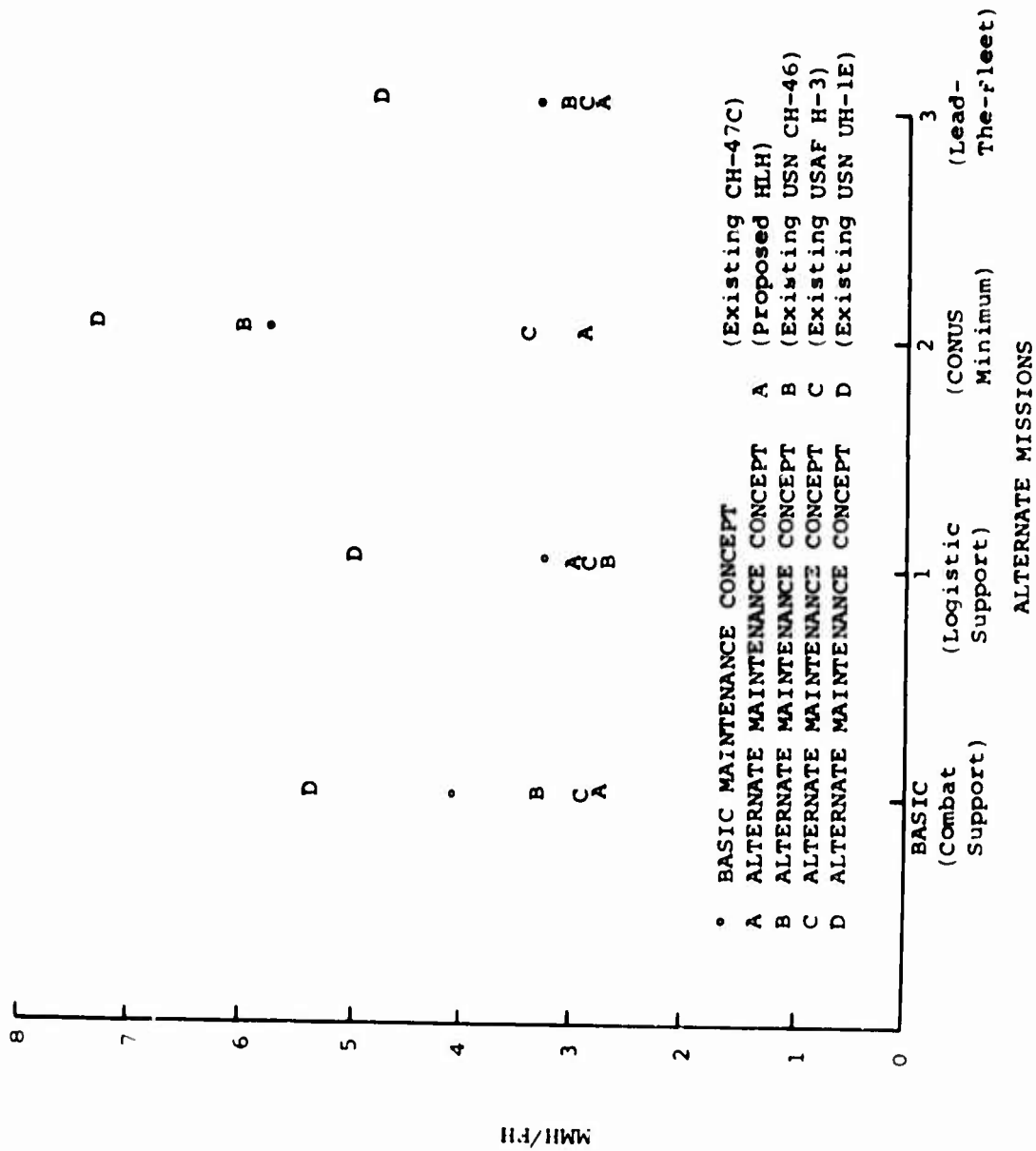


Figure 16. CH-47C Comparative Analysis - Maintenance Man-Hour per Flight-Hour Variations

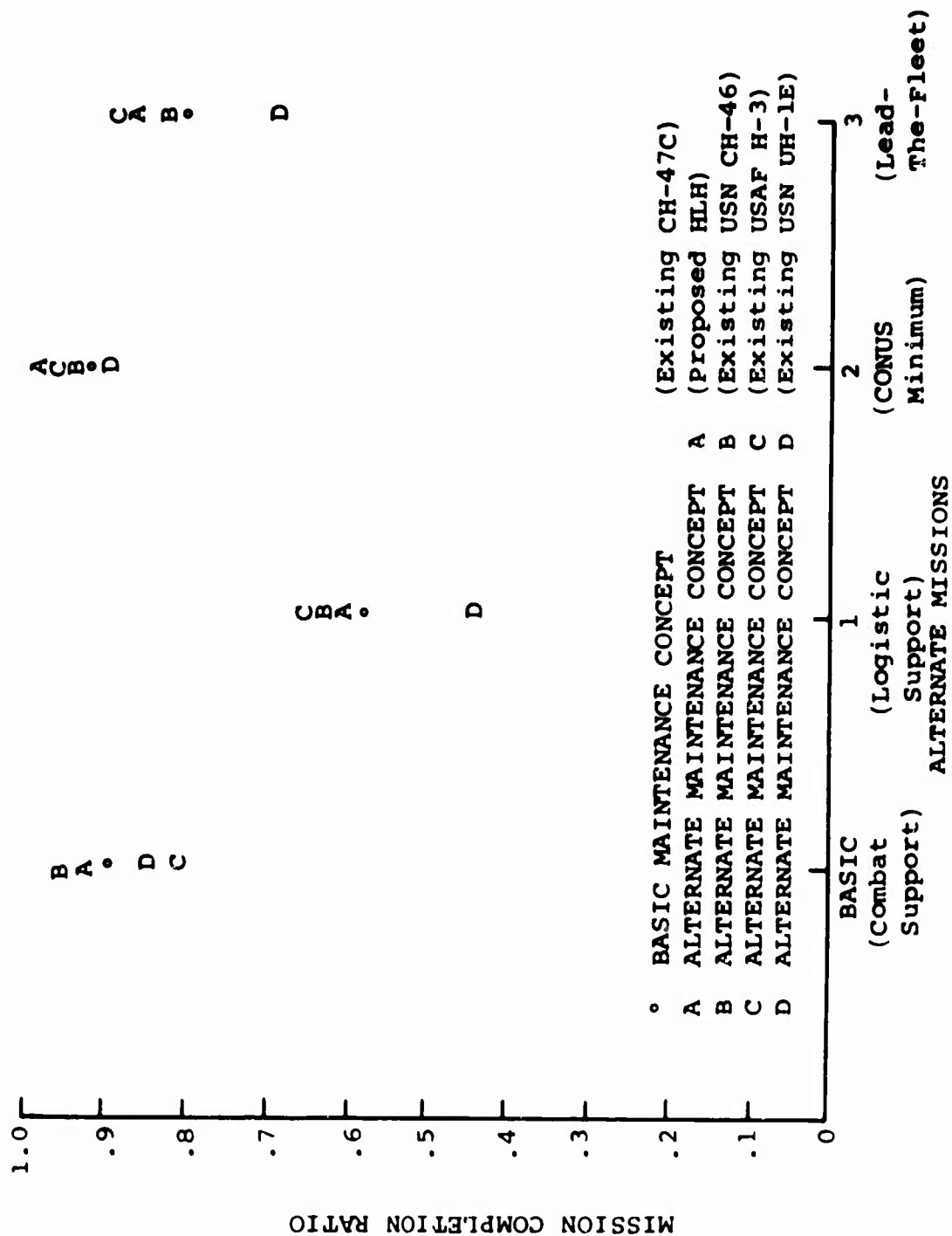


Figure 17. CH-47C Comparative Analysis - Mission Completion Ratio Variations.

TABLE XXVI. SELECTION OF HLH ALTERNATE MISSIONS AND MAINTENANCE CONCEPTS					
Missions	Container Unloading 150 Hrs/Month	CONUS - Minimum Util 20 Hrs/Month	Combat Support Surge 300 Hrs/Month	Combat Support Baseline 50 Hrs/Month	
Maintenance Concepts	3	4	2	1	
Basic Baseline Firm - End of day 10 hour 50 hour phased On condition					
Alternate A Daily - End of day Intermediate - 25 hours PMP - 100 hours TBO's	19	14	7	5	
Alternate B Turnaround - After each flight Daily - Prior to first flight Calendar - 34 weeks	17	15	8	11	
Alternate C Preflight - Before every flight Postflight - After each flight Phased PMP - Every 100 hours On condition	20	13	9	6	
Alternate D Preflight - Before each flight Postflight - After each flight Daily - Before first flight Calendar - 17 weeks	18	16	10	12	

information extracted from these data are presented in Figures 18 through 20.

ANALYSIS AND RANKING OF COMPARATIVE RESULTS

In order to rank the various maintenance concepts, it was necessary to derive a measure of effectiveness which could be used for comparing the results of the simulations. The three chosen parameters are availability, mission completion ratio, and total maintenance man-hours per flight hour. The weighting factors employed on these parameters are displayed in the following equation.

$$\text{INDEX OF MERIT} = (.75) (\text{MISSION COMPLETION RATIO}) \\ + (.15) (\text{AVAILABILITY}) + \frac{(.10)}{(\text{MMH/FH})}$$

To be consistent with the terminology used in Appendix III, the term Index of Merit is used in place of Measure of Effectiveness.

This Index of Merit has been plotted for each mission for the CH-47C and HLH in Figures 21 and 22, respectively. A review of these figures show that the previously existing (or basic) maintenance concepts are the best for most missions.

The ranking for the CH-47C and HLH maintenance concepts, resulting from an analysis of these figures, is shown in Table XXVII. This ranking has been derived by assuming that all the alternate missions are of equal weight.

CONCLUSIONS OF COMPARATIVE ANALYSIS

Table XXVII shows that the HLH basic maintenance concept performs best for the cross section of missions for both the CH-47C and HLH with respect to the identified index of merit. Modifying the index of merit could change this conclusion; however, it appears that the R&M simulation model is sufficiently sensitive to reflect the benefits of alternate maintenance concepts.

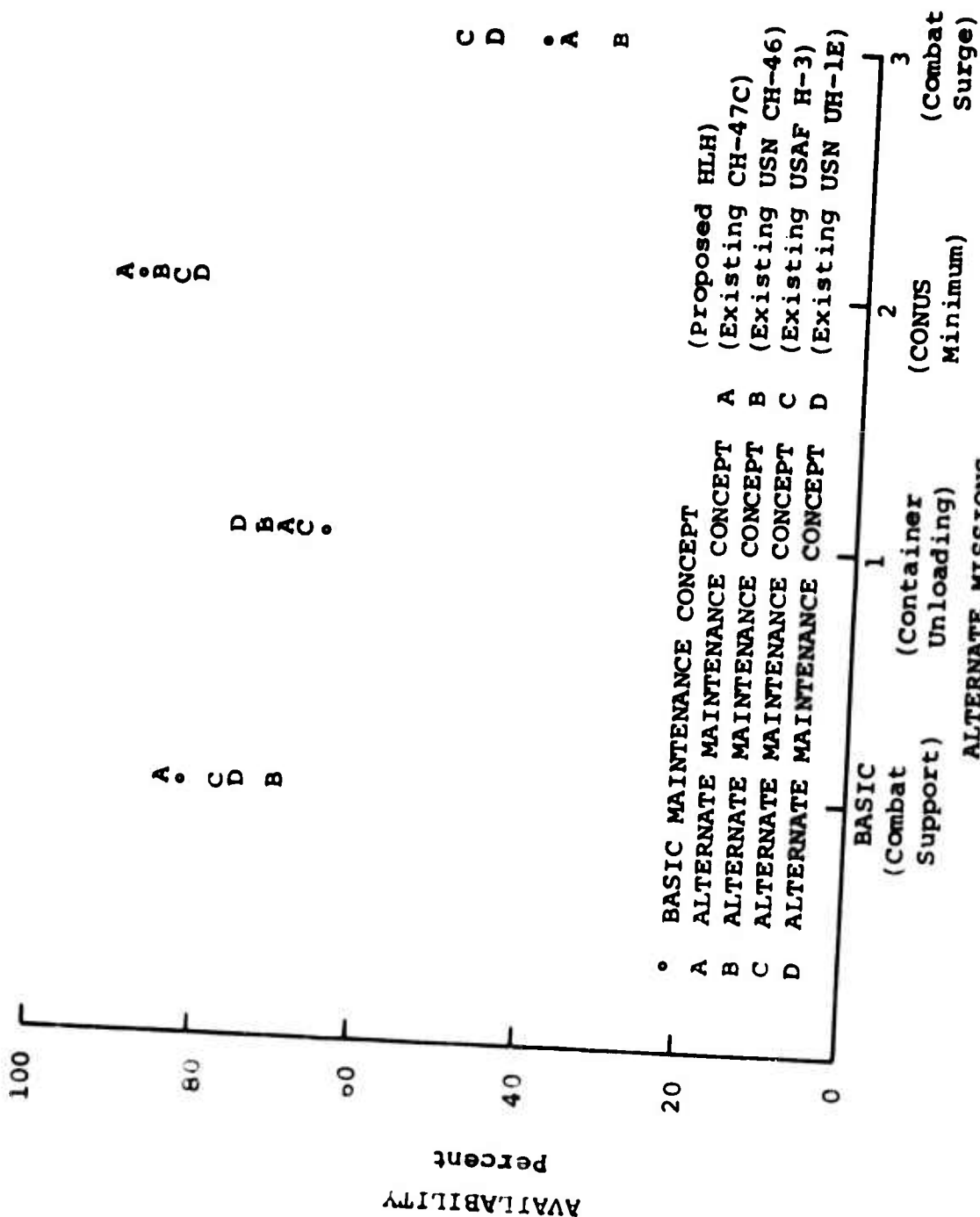


Figure 18. HLH Comparative Analysis - Availability Variations.

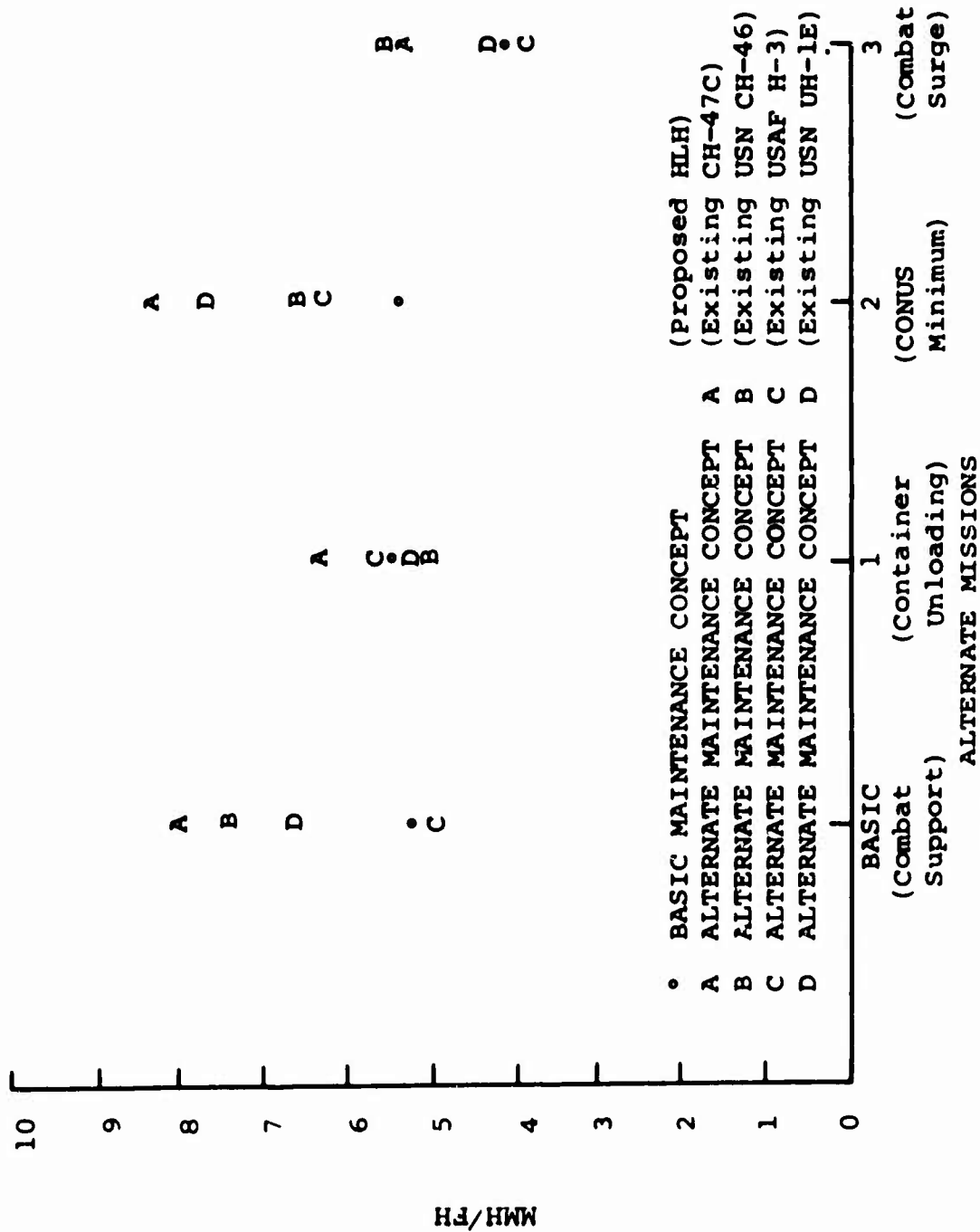


Figure 19. HLH Comparative Analysis - Maintenance Man-Hour per Flight-Hour Variations.

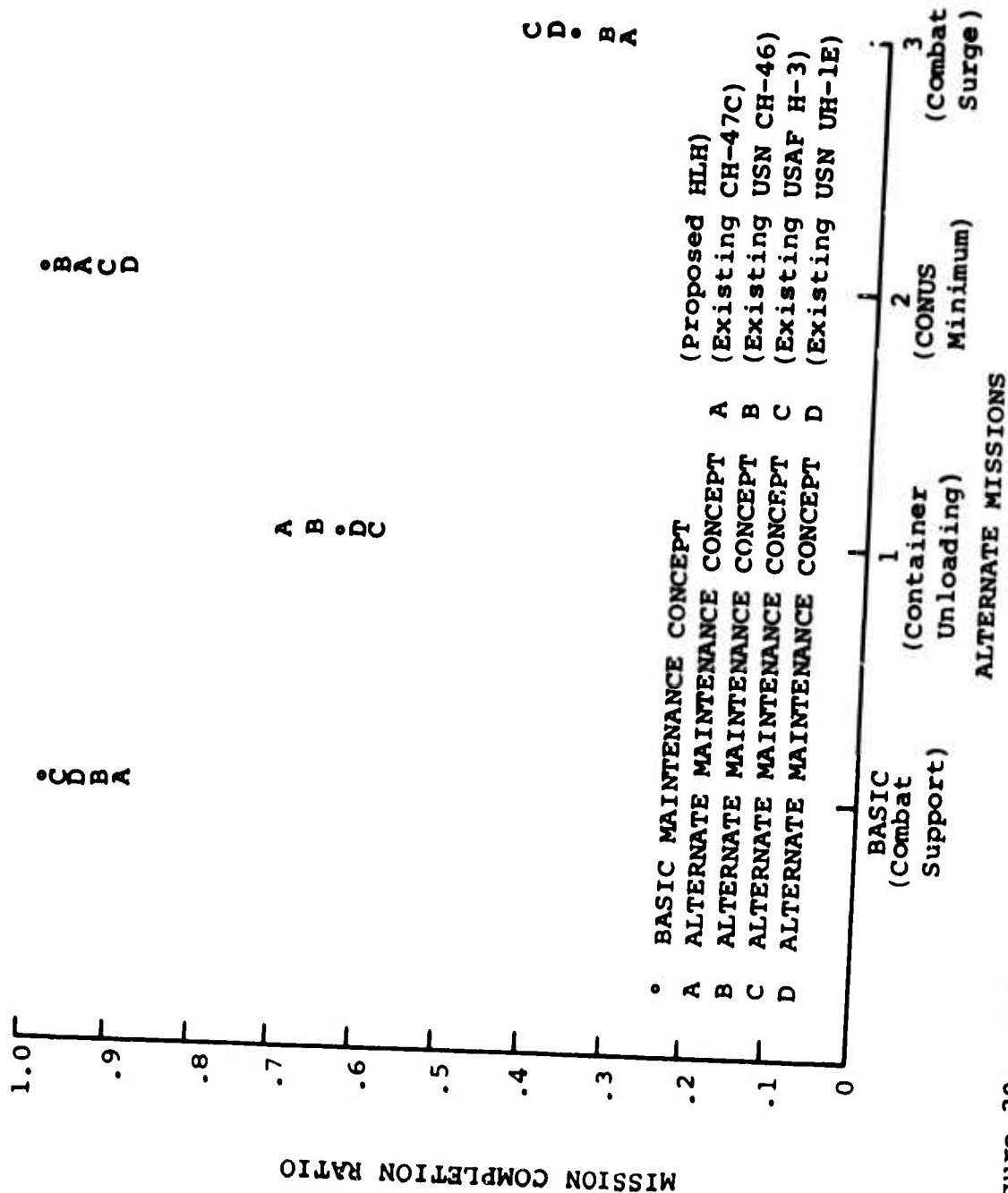


Figure 20. HLH Comparative Analysis - Mission Completion Ratio Variations.

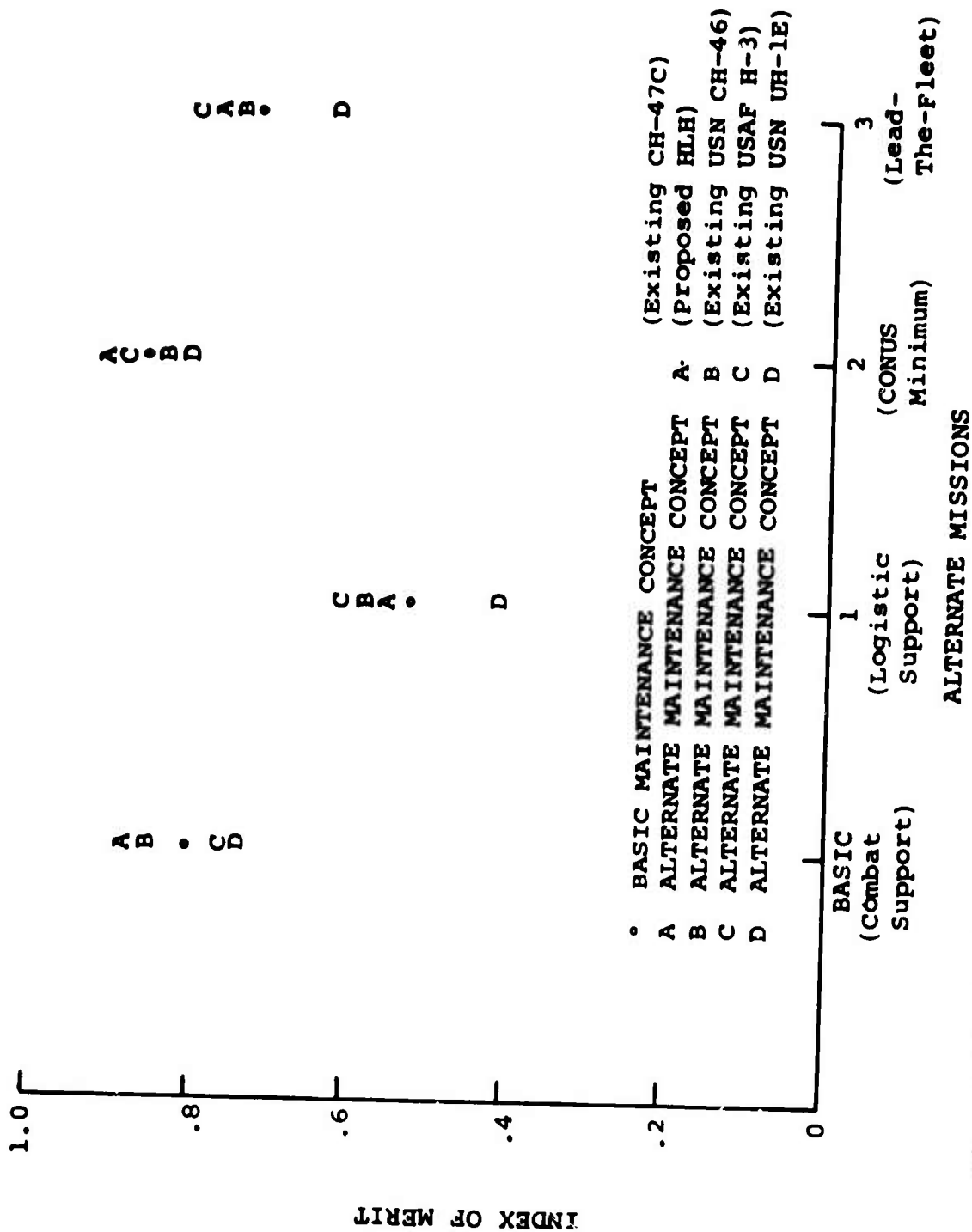


Figure 21. CH-47C Comparative Analysis - Index of Merit Variations.

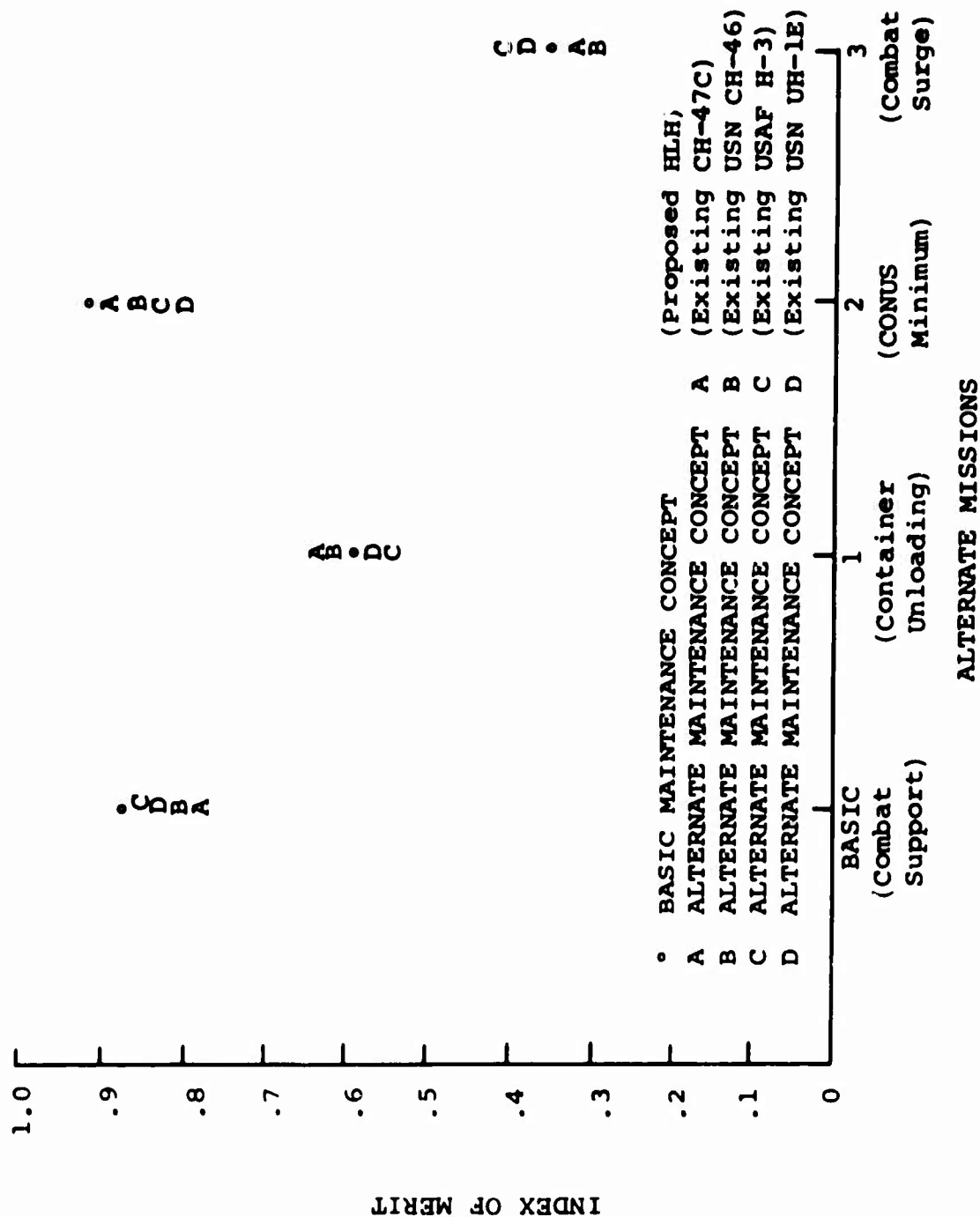


Figure 22. HLH Comparative Analysis - Index of Merit Variations.

TABLE XXVII. RELATIVE RANKING OF MAINTENANCE CONCEPTS				
CH-47C			HLH	
Rank	Maintenance Concepts	Rank	Maintenance Concepts	
1	Alternate Maintenance Concept A	1	Basic Maintenance Concept	
2	Alternate Maintenance Concept C	2	Alternate Maintenance Concept C	
3	Alternate Maintenance Concept B	3	Alternate Maintenance Concept A	
4	Basic Maintenance Concept	4	Alternate Maintenance Concept D	
5	Alternate Maintenance Concept D	5	Alternate Maintenance Concept B	

CONCLUSIONS

As a result of this study, valid R&M simulation models for the CH-47C and HLH are now available for the first time. In their present form, the models are more than adequate for further analyses similar to those performed in this study. That is, the model is extremely useful in evaluating the impact upon system effectiveness of major R&M differences.

Model validity has been established through various analytical techniques, including the evaluation of model sensitivity to parametric input changes. Model flexibility has been demonstrated through the various comparative analyses. Finally, model plausibility has been confirmed through the extended application of the model, observation of model response to logical changes, and detailed analysis of model operation with respect to logical validity. This last point is an almost intuitive judgement of the model's capability, based upon all aspects of model representation of realistic operations and maintenance environment.

In summary then, the developed models are valid representations of the actual O&M environments for the aircraft they simulate. These models are flexible to provide the Army with a tool for rapid response to fairly complex R&M questions. It should be noted, however, that the model's value is functionally dependent upon its level of detail. As such, it is a complex tool, requiring substantial skill in application and analysis of results. As such, it is critical that the application be made by people competent in the analytical areas of operations research and familiar with the logical structure of the programs. These powerful and complex models, although extremely valuable if well applied, could be equally misleading and, consequently, detrimental if misused.

RECOMMENDATIONS

It is recommended that the Army continue to develop the R&M model to maximize its flexibility and utility. It must always be remembered that the simulation model derives its value from its application, not merely its existence. Therefore, in most cases, further refinement to improve user orientation is cost effective. This position is reinforced by a statement taken from Ackoff in Scientific Method*.

"In general, the amount of analysis required to construct a model is inversely related to the ease of manipulating it once it has been constructed."

Some of the specific areas that are considered viable candidates for modification are:

- Develop input-controlled output editor to provide the user with flexibility in selecting output parameters relevant to his analysis.
- Eliminate constants from logic. Wherever possible, where constants remain in the logic, they should be fully justifiable and justified.
- Develop deterministic spares routine which could be a user-selected option available in lieu of the current probabilistic routine.
- Modify off-aircraft maintenance routines to allow for the identification of maintenance personnel doing off-aircraft repairs.
- Develop personnel substitution routine with user definition of policy of personnel substitution.

None of these recommendations are critical to the current R&M model. They are presented here as candidates for future refinement and enhancement or generalization of the model to further increase its utility.

*Ackoff, Russell L., SCIENTIFIC METHOD OPTIMIZING APPLIED RESEARCH DECISIONS, New York, John Wiley & Sons Inc., 1962, p. 110.

APPENDIX I

RESULTS OF SENSITIVITY ANALYSES

To demonstrate model sensitivity to changes in various maintenance parameters, several sensitivity analyses were identified and simulated. These analyses were structured to demonstrate model response to parametric changes. The discrete situations simulated were significant variations in parametric input, rather than meaningful representations of the simulated aircraft. As such, the value of the analyses is found in the identified trends and model responses, rather than in the quantitative outputs generated.

CH-47C

The CH-47C sensitivity analyses considered model response to parametric changes in the areas of TOE size and NORS probabilities. The data derived from these simulations is displayed in Table XXVIII. These results are discussed in the Model Validation section.

HLH

The HLH sensitivity analyses considered model response to parametric changes in four areas:

- Number of aircraft per platoon
- TOE size and distribution of personnel
- PMI/PMP intervals
- Maximum number of up-squawks per aircraft

The data derived from the simulations performed in these analyses are presented in Tables XXIX through XXXII. A discussion of these results and the identification of trends displayed by these analyses are contained in the Model Validation section.

TABLE XXVIII. CH-47C SENSITIVITY ANALYSES

Output Parameters	Essentially Infinite TOE							Mission No. Maint. Conc.	
	2		3		2		3		
	Basic	Basic	Basic	B	A	C	B		
	Basic	Basic	Basic	B	A	C	B		
Total number of missions flown	702	235	255	243	240	239	266		
Total number of missions called	756	252	260	252	280	252	280		
Total utilization	1053	352.5	382.5	364.5	360	358.5	399		
Total number of preflight inspections	0	0	0	0	0	0	0		
Total number of daily inspections	289	68	25	87	29	262	34		
Total number of PMF inspections	35	17	14	218*	32	196*	209*		
Total number of PMP inspections	13	5	3	2	8	1	0		
Total preflight MMH	0	0	0	0	0	0	0		
Total daily MMH	1387	326.4	120	417.6	11.6	0	163.2		
Total PMF MMH	416.5	202.3	166.6	65.4*	280	117.6*	62.7*		
Total PMP MMH	585.0	225.0	135.0	234.0	140	10.5	0		
Total unscheduled maintenance actions	1966	617	364	496	514	260	213		
Total scheduled maintenance actions	216	72	54	34	54	18	0		
Total unscheduled MMH	2138.8	698.31	435	600.3	624.9	282.7	238.7		
Total scheduled MMH	2946.8	1302.3	849	1047.4	856.7	539.6	225.9		
Total unscheduled EMT	981.0	525.3	165.8	515.7	248.2	288.3	157.2		
Total scheduled EMT	320.5	135.3	117.5	99.4	264	70.3	234.0		
Total MMH/PH	5.18	5.38	3.20	4.31	3.78	2.15	1.13		
Total NORIS	0	0	0	0	0	0	0		
Total ground abort	0	0	0	0	0	0	0		
GSE delay	0	0	0	0	0	0	0		
NORIS delay	0	0	0	0	0	0	0		
NORM delay	1301.5	660.6	283.3	615.1	512.2	358.6	391.2		
Total air aborts	31	16	9	8	11	13	7		
No. maintenance actions at preflight	0	0	0	0	0	125	0		
No. maintenance actions at aircrew	0	0	0	0	0	0	0		
No. maintenance actions inflight	78	11	14	17	17	22	13		
No. maintenance actions during PMF	242	194	160	100*	372	65*	78*		
No. maintenance actions at daily	655	260	86	305	34	35	115		
No. maintenance actions at PMP	991	135	95	65	80	35	0		
Personnel nonzer entries	1900	500	135	450	160	80	86		
WTR distribution	1.5	1.4	1.5	1.3	1.3	1.2	.8		
Off aircraft WTR	0	0	0	0	0	0	0		
Availability	87.89	91.06	85.94	91.67	74.6	95.14	80.59		
MAF/PH	1.8	1.75	.95	1.36	1.43	.72	.53		

* - Postflights

* Postflights

TABLE XXVIII. Continued

Output Parameters	Probability of NORS equals (1 - true probability of NORS) TOE is essentially infinite for all runs											
	Basic			2			3			Basic		
	B	A	2	B	A	2	B	A	2	B	A	3
Total number of missions flown	664	537	704	649	300	175	300	175	695	267	721	Basic
Total number of missions called	756	756	756	756	784	784	784	784	756	756	756	A
Total utilization	996	805.5	1056.0	973.5	450.0	262.5	450.0	262.5	1042.5	400.5	1078.5	726
Total number of preflight inspections	0	0	0	712	0	0	0	0	0	0	0	756
Total number of daily inspections	305	65	114	0	28	15	0	15	68	17	0	1086
Total number of PMI inspections	579*	76	565*	506*	234*	25	0	25	35	15	567*	249
Total number of PMP inspections	1	18	0	712	0	7	0	7	12	4	14	107
Total preflight MMH	0	0	0	0	0	0	0	0	0	0	0	27
Total daily MMH	1464	26	547.2	0	134.4	6.00	0	6.00	326.4	81.6	809	0
Total PMP MMH	173*	665	169.5*	303.6*	70.2*	218.75	0	218.75	416.5	178.5	340.2*	99.6
Total PMH MMH	117.0	315	0	115.5	0	122.5	0	122.5	540.0	180.0	147.0	936.25
Total unscheduled maintenance actions	1374	1204	667	939	204	429	0	429	1042	397	1029	475.50
Total scheduled maintenance actions	0	0	0	0	0	0	0	0	0	0	0	1818
Total unscheduled MMH	1554.1	1464.4	840.52	1155.8	220.8	578.52	0	578.52	1214	493.81	1159.9	2249.36
Total scheduled MMH	1754.7	1006.0	716.70	1131.1	204.6	347.25	0	347.25	1282.9	480.10	1296.2	1508.35
Total unscheduled EMT	908.5	450.4	410.4	538.8	123.3	171.9	0	171.9	414.6	112.4	488.6	933.0
Total scheduled EMT	186.7	560.0	169.5	198.3	210.3	168.5	0	168.5	297.0	111.4	251.1	855.1
Total MMH/FH	3.17	2.74	1.42	2.21	.92	3.2	0	3.2	2.3	2.24	2.15	3.19
Total NORS	2091.0	1240.1	1074.8	1822.6	432.0	816	0	816	1436	622	1329.5	1742.5
Total ground abort	0	0	0	0	0	0	0	0	0	0	0	0
GSE delay	0	0	0	0	0	0	0	0	0	0	0	0
NORM delay	2091	1240.1	1074.8	1822	432	816	0	816	1436.1	622	1329	1742
Total air aborts	1095.2	1010.4	579.9	737.1	340.4	711.6	0	711.6	739.7	377	1786.1	0
No. maintenance actions at preflight	30	33	30	41	11	8	0	8	23	10	37	30
No. maintenance actions at aircrew	0	0	0	0	0	0	0	0	0	0	0	0
No. maintenance actions inflight	26	40	58	46	18	41	0	18	41	14	50	0
No. maintenance actions during PMI	185*	850*	186*	146*	77*	284	0	77*	399	152	190*	48
No. maintenance actions at daily	1099	70	393	0	92	19	0	19	215	74	0	1217
No. maintenance actions at PMP	35	210	0	340	0	100	0	100	355	145	390	260
Personnel nonzero entries	994	249	220	121	63	94	0	63	311	87	78	800
MTR distribution	.81	.86	.82	.87	.79	.88	0	.88	.84	.87	.83	.88
Off aircraft MTR	0	0	0	0	0	0	0	0	0	0	0	0
Availability	70.36	69.55	77.61	65.37	62.02	42.63	0	42.63	70.94	58.1	80.75	67.25
HALF/FH	1.37	1.50	.64	.95	.43	1.64	0	1.64	1.0	1.0	.95	1.67

* Postflights

TABLE XXIX. HLF VALIDATION - NUMBER OF AIRCRAFT SENSITIVITY

Control Parameter	Expected Value (Baseline)	Output Values				Run No. Date
		465 6/27	253 7/3	256 7/3	257 7/3	
Total number of missions flown	247	247	249	242	187	
Total number of missions called	252	252	252	252	252	
Total utilization	494	494	498	484	374	
Total number of preflight inspections	= 0	0	0	0	0	
Total number of daily inspections	<252	163	219	87	21	
Total number of PMI inspections	38	42	43	43	33	
Total number of PMP inspections	7	11	10	9	7	
Total preflight MMH	= 0					
Total daily MMH	<151.2	77.8	131.4	52.2	12.6	
Total PMI MMH	380.0	420	430.0	430	330	
Total PMP MMH	140.0	220	200	180	140	
Total unscheduled maintenance actions	1.05 X utilization	515	512	454	334	
Total scheduled maintenance actions	= 0	0	0	0	0	
Total unscheduled MMH	-	1575.5	1991.4	1490.4	1749.8	
Total scheduled MMH	-	737.8	761.40	662.2	482.6	
Total unscheduled EMT	-	353.2	458.9	322.3	333.6	
Total scheduled EMT	-	475.5	475.5	426.6	329.7	
Total MMH/FH	-	4.45	5.28	4.23	5.60	
Total NORs	= 0	0	0	0	0	
Total ground abort	= 0	0	0	0	0	
GSE delay	= 0	0	0	0	0	
NORS delay	= 0	0	0	0	0	
NORM delay	= 0	0	0	0	0	
Total air aborts	5.04	828.7	934.4	751.9	663.3	
Number maintenance actions at preflight	= 0	0	0	0	0	
Number maintenance actions at aircrew	= (0)	0	0	0	0	
Number maintenance actions inflight	= (10) (no. mission flown)	27	32	22	15	
Number maintenance actions during PMI	= (5) (no. PMI's)	235	214	235	178	
Number maintenance actions at daily	= (35) (no. dailies)	56	74	33	7	
Number maintenance actions at PMP	= (18) (no. PMP's)	195	193	157	125	
Availability	-	86.3	87.35	81.35	67.09	
Personnel nonzero entries	0	806	933	320	327	
MTR distribution	-	.93	1.1	1.22	1.36	
Off aircraft MTR	= 0	0	0	0	0	
MAIF/FH	1.05	1.04	1.03	.94	.89	
Number of aircraft		9	11	6	3	

TABLE XXX. HLM VALIDATION - NUMBER OF SQUAWS SENSITIVITY

Control Parameter	Expected Value (Baseline)	Output Values				Run No.
		465	558	560	563	
		6/27	7/6	7/6	7/6	
Total number of missions flown	247	247	247	246	247	247
Total number of missions called	252	252	252	252	252	252
Total utilization	494	494	494	492	494	494
Total number of preflight inspections	0	0	0	0	0	0
Total number of daily inspections	252	163	157	149	156	156
Total number of PMF inspections	38	42	41	43	41	41
Total number of PMP inspections	7	11	12	10	12	12
Total preflight MWH	0	0	0	0	0	0
Total daily MWH	151.2	77.8	94.2	89.4	94.8	94.8
Total PMF MWH	380.0	420	410	430	410	410
Total PMP MWH	140.0	220	240	200	240	240
Total unscheduled maintenance actions	1.05 X utilization	515	532	456	534	534
Total scheduled MWH	0	0	0	0	0	0
Total unscheduled MWH	1575.5	2021	1612.2	2050.9	2050.9	2050.9
Total scheduled EMT	737.8	744.2	719.4	744.8	744.8	744.8
Total unscheduled EMT	353.2	474.1	484.1	501.6	501.6	501.6
Total MWH/FH	475.5	566.9	432.2	578.2	578.2	578.2
Total NORs	4.45	5.32	4.55	5.40	5.40	5.40
Total ground abort	0	0	0	0	0	0
GSE delay	0	0	0	0	0	0
NORs delay	0	0	0	0	0	0
NORM delay	0	0	0	0	0	0
Total air aborts	828.7	1041.0	916.3	1079.8	1079.8	1079.8
Number maintenance actions at preflight	5.04	5	6	5	5	5
Number maintenance actions at aircrew	0	0	0	0	0	0
Number maintenance actions inflight	(6)	0	1	1	1	1
Number maintenance actions during PMF	(.10) (no. mission flown)	27	25	20	25	25
Number maintenance actions at daily	(5) (no. PMF's)	235	221	254	221	221
Number maintenance actions at PMP	(.35) (no. PMF's)	56	54	43	54	54
Availability	(18) (no. PMP's)	195	227	133	231	231
Personnel nonzero entries	86.3	82.82	84.88	82.17	82.17	82.17
MTTR distribution	806	915	714	895	895	895
Off aircraft MTTR	.97	1.14	1.01	1.10	1.10	1.10
WALF/PH	0	0	0	0	0	0
Maximum number of up squawks	1.05	1.04	1.08	.93	1.08	1.08
	100	10	1	5		

TABLE XXI. HLH VALIDATION - PMP SENSITIVITY

Control Parameter	Expected Value (Baseline)	Output Values						Run No.	
		465 6/27	155 7/3	156 7/3	158 7/3	334 7/5	335 7/6		579 7/6
Total number of missions flown	247	247	245	244	246	248	246	245	
Total number of missions called	252	252	252	252	252	252	252	252	
Total utilization	494	494	490	488	492	496	492	490	
Total number of preflight inspections	0	0	0	0	0	0	0	0	
Total number of daily inspections	252	163	193	186	176	178	187	185	
Total number of PMI inspections	38	42	5	49	14	18	4	50	
Total number of PMP inspections	7	11	0	0	6	6	2	0	
Total preflight WWH	0	0	0	0	0	0	0	0	
Total daily WWH	151.2	77.8	115.8	111.6	105.6	106.80	112.20	111	
Total PMI WWH	380.0	420	50	490	140.0	180.0	40.0	500	
Total PMP WWH	140.0	220	0	0	120.0	120.0	40.0	0	
Total unscheduled maintenance actions	1.05 X utilization	515	116	363	291	289	158	356	
Total scheduled maintenance actions	0	0	0	0	0	0	0	0	
Total unscheduled WWH	1573.5	737.8	438.9	1271.3	1231.5	1339.2	701.3	1307.8	
Total scheduled WWH	0	0	0	0	0	0	0	0	
Total unscheduled EMT	353.2	109.6	314.7	286.3	250.8	250.8	208.3	350.9	
Total scheduled EMT	474.5	28.0	336.6	194.8	212.3	212.3	48.0	344.1	
Total WWH/PH	4.45	1.21	3.77	3.13	3.13	3.41	1.77	3.86	
Total WORS	0	0	0	0	0	0	0	0	
Total ground abort	0	0	0	0	0	0	0	0	
GSE delay	0	0	0	0	0	0	0	0	
WORS delay	0	0	0	0	0	0	0	0	
NORM delay	0	0	0	0	0	0	0	0	
Total air aborts	5.24	828.7	137.6	651.3	481.1	463.1	256.3	695.0	
Number maintenance actions at preflight	0	0	0	0	0	0	0	0	
Number maintenance actions at aircrew	0	0	0	0	0	0	0	0	
Number maintenance actions inflight	0	0	0	0	0	0	0	0	
Number maintenance actions during PMI	(.10)	27	19	27	22	23	27	17	
Number maintenance actions at daily	(.10)	235	29	270	76	95	21	272	
Number maintenance actions at PMP	(.35) (no. PMIs)	56	61	58	69	53	72	60	
Availability	(18) (no. PMP's)	195	0	0	119	114	34	0	
Personnel nonzero entries	86.3	97.72	89.26	92.04	92.04	92.34	95.76	88.5	
WTR distribution	806	18	496	507	485	485	268	450	
Off aircraft WTR	-.93	1.07	1.05	1.24	1.24	1.30	1.66	1.10	
WTR/PH	0	0	0	0	0	0	0	0	
PMP interval (hrs)	1.05	1.04	.24	.74	.59	.58	.32	.73	
PMI interval (hrs)	50.0	800.0	300.0	100.0	100.0	100.0	800.0	300.0	
	10.0	100.0	10.0	25.0	25.0	25.0	100.0	10.0	

TABLE XXXII. HLM VALIDATION - PERSONNEL SENSITIVITY

Control Parameter	Expected Value (Baseline)	Output Values										Run No. Date
		465 6/27	906 6/28	907 6/28	6/28	6/28	6/28	72 5/28	70 6/28	70 6/28	70 6/28	
Total number of missions flown	247	247	246	245	245	245	245	246	245	245	245	
Total number of missions called	252	252	252	252	252	252	252	252	252	252	252	
Total utilization	494	494	492	490	490	490	490	492	490	490	490	
Total number of preflight inspections	< 252	0	0	0	0	0	0	0	0	0	0	
Total number of daily inspections	38	163	180	171	138	163	166	163	166	166	166	
Total number of PMI inspections	7	11	10	10	10	10	11	10	11	11	11	
Total preflight MMH	< 151.2	0	0	0	0	0	0	0	0	0	0	
Total daily MMH	97.8	108.0	102.6	102.6	82.8	97.8	99.6	97.8	99.6	99.6	99.6	
Total PMI MMH	380.0	420	420	420	430	420	420	420	420	420	420	
Total MMH	140.0	220	200	200	220.0	200	220	200	220	220	220	
Total scheduled maintenance actions	1.05 X utilization	515	518	501	458	501	458	501	478	478	478	
Total unscheduled maintenance actions	0	0	0	0	0	0	0	0	0	0	0	
Total scheduled MMH	1575.5	2269.9	2391.2	2391.2	1379.4	1700.4	1667.8	1700.4	1667.8	1667.8	1667.8	
Total unscheduled MMH	737.8	728	722.6	722.6	732.8	717.8	729.6	732.8	717.8	729.6	729.6	
Total scheduled EMT	353.2	440.2	516.8	516.8	683.6	452.0	401.3	452.0	401.3	401.3	401.3	
Total unscheduled EMT	475.5	402.0	420.3	420.3	690.5	512.9	459.1	512.9	459.1	459.1	459.1	
Total MMH/FH	4.45	5.80	6.02	6.02	4.08	4.66	4.63	4.66	4.63	4.63	4.63	
Total NORS	0	0	0	0	0	0	0	0	0	0	0	
Total ground abort	0	0	0	0	0	0	0	0	0	0	0	
GSE delay	0	0	0	0	0	0	0	0	0	0	0	
NORS delay	0	0	0	0	0	0	0	0	0	0	0	
NORM delay	0	0	0	0	0	0	0	0	0	0	0	
Total air aborts	828.7	842.2	937.1	937.1	1374.1	984.9	860.4	984.9	860.4	860.4	860.4	
Number maintenance actions at preflight	5.04	5	6	7	7	7	6	7	6	7	7	
Number maintenance actions at aircrew	0	0	0	0	0	0	0	0	0	0	0	
Number maintenance actions inflight	(0)	0	0	0	0	0	0	0	0	0	0	
Number maintenance actions during PMI	(.10) (no. missions flown)	27	43	29	28	20	25	20	25	25	25	
Number maintenance actions at daily	(5) (no. PMI's)	235	224	228	197	232	206	232	206	206	206	
Number maintenance actions at PMP	(.35) (no. daily's)	56	76	62	45	58	62	45	58	62	62	
Availability	(18) (no. PMP's)	195	170	178	182	190	180	182	180	180	180	
Personnel nonzero entries	86.3	86.1	84.5	84.5	77.31	83.7	85.77	83.7	85.77	85.77	85.77	
MTR distribution	806	111	350	350	1088	630	965	630	965	965	965	
Off aircraft MTR	.93	1.199	1.26	1.26	.95	.99	1.03	.99	1.03	1.03	1.03	
MAIF/YH	1.05	1.04	1.05	1.02	.93	1.02	.98	1.02	.98	.98	.98	
Total TOE	36	360	100	100	24	36	36	36	36	36	36	
Personnel types 01, 02 - first shift	13.6	90.90	25.25	25.25	6.6	9.9	18.6	9.9	18.6	18.6	18.6	
Personnel types 01, 02 - second shift	11.6	90.90	25.25	25.25	6.6	9.9	18.6	9.9	18.6	18.6	18.6	

APPENDIX II
INPUT CHANGES FOR COMPARATIVE ANALYSES

CH-47C

Tables XXXIII through XXXVI identify the various alternate mission/maintenance concept combinations simulated for the CH-47C comparative analyses.

HLH

Tables XXXVII through XXXIX identify the alternate missions employed in the HLH comparative analysis.

Tables XL through XLIII contain the alternate maintenance concepts used in the analysis.

All combinations of runs made in the HLH analyses can be reproduced by combining the proper mission/maintenance concept alternatives.

TABLE XXXIII. CH-47C ALTERNATE MAINTENANCE CONCEPTS - BASIC MISSION

[illegible]

TABLE XXXIV. CH-47C ALTERNATE MAINTENANCE CONCEPTS - MISSION 1

[illegible]

TABLE XXXV. CH-47C ALTERNATE MAINTENANCE CONCEPTS - MISSION 2

[illegible]

TABLE XXXVI. CH-47C ALTERNATE MAINTENANCE CONCEPTS - MISSION 3

MISSION 3		MAINTENANCE CONCEPT BASIC	
0	CH-47 MISSION 3 - 100 449/43- FT. RUCKER- LEAD THE FLEET	*****00165401	
0	3 A/C PER SITE-43 STANDBY	*****00165402	
0	INITIAL 441(1-10,10),1	MISSION 3,BASIC	*****00165403
	INITIAL 441(10,5),1	*****00165404	
	INITIAL 441(10,11),15	*****00165405	
	INITIAL 441(1,12),10	*****00165406	
	INITIAL K194,1	*****00165407	
	INITIAL 441(1,15),0	*****00165408	
	INITIAL K191,3	*****00165409	
	INITIAL K192,5	*****00165411	
	INITIAL K193,480	*****00165412	
	INITIAL 441(2,12),35	*****00165413	
0	MISSION 3	MAINTENANCE CONCEPT A	
2	00010016 200102	00025100	
12	FUNCTION 441,32	00027600	
0,30001	0,99992	00027700	
0,30005	0,000010 0,700013 0,000020 0,999925	00028500	
0	CH-47 MISSION 3 - 100 449/43- FT. RUCKER- LEAD THE FLEET	*****00165401	
0	3 A/C PER SITE-43 STANDBY	*****00165402	
	INITIAL 441(1-10,10),1	MISSION 3,A	*****00165403
	INITIAL 441(10,5),1	*****00165404	
	INITIAL 441(10,11),15	*****00165405	
	INITIAL 441(1,12),10	*****00165406	
	INITIAL K194,1	*****00165407	
	INITIAL 441(1,15),0	*****00165408	
	INITIAL K191,3	*****00165409	
	INITIAL K192,5	*****00165411	
	INITIAL K193,480	*****00165412	
	INITIAL 441(2,12),35	*****00165413	
0	CH-47 MAINT CONCEPT A -DAILY,10 44,50 4R PRI	*****00165500	
	INITIAL 441(1,8),70	*****00165501	
	INITIAL 441(1,9),35	*****00165502	
	INITIAL 441(2,1),25	*****00165503	
	INITIAL 441(3,1),70	*****00165504	
	INITIAL 441(10,1),25	*****00165505	
	INITIAL 441(11,1),35	*****00165506	
	INITIAL K190,500	*****00165507	
	INITIAL K190,100	*****00165509	
	INITIAL 446(12,1-18),30000	MISSION 3,A	*****00165509
0	MISSION 3	MAINTENANCE CONCEPT B	
1	.9999992 9999995 9999998 75000011 99999916 25000000023400	00151000	
56	FUNCTION 441,32	00151100	
0,50004	0,99995	00151200	
0	CH-47 MISSION 3 - 100 449/43- FT. RUCKER- LEAD THE FLEET	*****00165401	
0	3 A/C PER SITE-43 STANDBY	*****00165402	
	INITIAL 441(1-10,10),1	MISSION 3,B	*****00165403
	INITIAL 441(10,5),1	*****00165404	
	INITIAL 441(10,11),15	*****00165405	
	INITIAL 441(1,12),10	*****00165406	
	INITIAL K194,1	*****00165407	
	INITIAL 441(1,15),0	*****00165408	
	INITIAL K191,3	*****00165409	
	INITIAL K192,5	*****00165411	
	INITIAL K193,480	*****00165412	
	INITIAL 441(2,12),35	*****00165413	

TABLE XXXVI. Continued

0	CM-47C	MAINT CONCEPT 2:				00165500
	INITIAL	X100,1000				00165501
	INITIAL	X100,20				00165502
	INITIAL	4X1(1,2),30000				00165503
	INITIAL	4X1(2,1),30				00165504
	INITIAL	4X1(3,1),35				00165505
	INITIAL	4X1(10,1),20				00165506
	INITIAL	4X1(11,1),3				00165507
	INITIAL	4X1(1,0),35				00165508
	INITIAL	4X1(1,0),3				00165509
0	MISSION 3	MAINTENANCE CONCEPT 0				
1	.0000000	0000000	0000000	75000011	00000016	25000000023400
96.	FUNCTION	4X1,32				00151000
0.50002	0.00003					00151100
0						00151200
0	CM-47	MISSION 3 = 100 HRS/40 FT. RUCKER = LEAD THE FLEET				*****00165501
0	3 A/C PER SITE=40 STANDBY					*****00165502
	INITIAL	4X1(1-10,10),1	MISSION 3, BASIC			*****00165503
	INITIAL	4X1(10,5),1				*****00165504
	INITIAL	4X1(10,11),15				00165505
	INITIAL	4X1(1,12),10				00165506
	INITIAL	X100,1				00165507
	INITIAL	4X1(1,15),0				00165508
	INITIAL	X101,3				00165509
	INITIAL	X102,5				00165510
	INITIAL	X103,400				00165511
	INITIAL	4X1(2,12),35				00165512
	INITIAL	X100,30000				00165513
	INITIAL	X100,20				00165514
	INITIAL	4X1(1,2),105				00165515
	INITIAL	4X1(2,1),240				00165516
	INITIAL	4X1(3,1),100				00165517
	INITIAL	4X1(10,1),90				00165518
	INITIAL	4X1(11,1),20				00165519
	INITIAL	4X1(1,0),100				00165520
	INITIAL	4X1(1,0),3				00165521
	INITIAL	X100,3				00165522
	INITIAL	X103,110				00165523

TABLE XXXVII. HLH ALTERNATE MISSION 1		
MISSION 1 = 3 A/C = MLM = NO STANDBY REQUIRED		00103510
INITIAL	4M1(1-10,5),1/4M1(1-10,10),1	00103520
INITIAL	4M1(1,11),70/4M1(2-10,11),10/4M1(1,12),10	00103530
INITIAL	4M1(2,12),80/4M1(3,12),0/4M1(0,12),0	00103540
INITIAL	4M1(1,13),0/4M1(2,14),2	00103550
INITIAL	X101,43	00103560
INITIAL	X106,41	00103570

TABLE XXXVIII. HLH ALTERNATE MISSION 2		
MISSION 2 = 9 A/C = 1 STANDBY REQUIRED		00103510
INITIAL	4M1(1-2,5),1/4M1(1-2,10),3	00103520
INITIAL	4M1(1,11),80/4M1(2,11),00/4M1(1,12),2	00103530
INITIAL	4M1(2,12),120/4M1(3,12),0/4M1(0,12),0	00103540
INITIAL	X106,43	00103550

TABLE XXXIX. HLH ALTERNATE MISSION 3		
MISSION 3 = 9 A/C = MLM = STANDBY REQUIRED		00103510
INITIAL	4M1(1-10,5),1/4M1(1-5,10),4/4M1(6-10,10),9	00103520
INITIAL	4M1(1,11),70/4M1(2-10,11),10/4M1(1,12),10	00103530
INITIAL	4M1(2,12),80/4M1(3,12),0/4M1(0,12),0	00103540
INITIAL	4M1(0,6),30000/4M1(1,21),240	00103550

TABLE XL. HLH ALTERNATE MAINTENANCE CONCEPT A

8	00010016	200150	00025100
10.	FUNCTION	R41,02	00020400
0.300000	0.999955		00020500
0			00020600
0			00020700
0			00020800
95.	FUNCTION	R41,02	00103200
0.300015	0.999910		00103300
0			00103400
0			00103510
0	MAINTENANCE CONCEPT- ALTERNATE: A = 100 HR PMP 25 HR PMJ -HLH-----		00103520
0			00103530
INITIAL	4K1(1,2),220/4K1(2,1),00/4K1(3,1),00/4K1(5,1),6720		00104400
INITIAL	4K1(10,1),40/4K1(4,6),30000		00104500
INITIAL	4K1(11,1),40		00104600
INITIAL	4K1(1,0),00/4K1(1,9),40/4K1(1,10),3		00104700
INITIAL	K100,K1000		00104900
INITIAL	K100,K250		00105000
INITIAL	4M6(16,1-5),1200/4M6(16,4-6),2400/4M6(16,7-10),1200		00105600
INITIAL	4M6(16,11),800/4M6(17,1),2157/4M6(17,2),2121		00105610
INITIAL	4M6(17,3),2106/4M6(17,4),2146/4M6(17,5),2147		00105620
INITIAL	4M6(17,6),2134/4M6(17,7),1914/4M6(17,8),1919		00105630
INITIAL	4M6(17,9-10),1932/4M6(17,11),0402		00105640
INITIAL	4M6(18,1-11),0		00105650

TABLE XLI. HLH ALTERNATE MAINTENANCE CONCEPT B

0	CHANGES TO INCORPORATE CALENDAR INSPECTION INTERVALS	00002710
10	VARIABLE (241+1000+241)0X195 INITIAL DAYS SINCE PMP	00002800
11	VARIABLE (247+(C1/240))0X195 DAYS SINCE PMP	00002900
236	VARIABLE X195-X196 PMP CALENDAR HISTORY	00019010
1	0000002 5500005 0000000 25000011 00000016 250000	00023400
17	00000121 000000	00023500
2	00010016 230113	00023100
18	FUNCTION 241,32	00028400
0.500050	0.000051	00028500
0		00028600
0		00028700
0		00028800
56	FUNCTION 241,32	00103200
0.60002	0.00003	00103300
0		00103400
0	MAINTENANCE CONCEPT -ALTERNATE B - 36 WEEK CAL. INSP.	00104310
0	-----	00104320
INITIAL	4X1(1,2),220/4X1(2,1),130/4X1(3,1),150/4X1(5,1),6720	00104400
INITIAL	4X1(10,1),20/4X1(4,6),30000	00104500
INITIAL	4X1(11,1),3	00104600
INITIAL	4X1(1,8),150/4X1(1,9),5/4X1(1,10),3	00104700
INITIAL	X189,430000	00104900
INITIAL	X190,420	00105000
INITIAL	446(16,1-3),1200/446(16,4-6),2400/446(16,7-10),1200	00105600
INITIAL	446(16,11),500/446(17,1),2157/446(17,2),2121	00105610
INITIAL	446(17,3),2105/446(17,4),2146/446(17,5),2147	00105620
INITIAL	446(17,6),2133/446(17,7),1914/446(17,8),1915	00105630
INITIAL	446(17,9-10),1932/446(17,11),0402	00105640
INITIAL	446(18,1-11),4	00105650
INITIAL	X194,4	0010570
INITIAL	X196,7	00105710
INITIAL	X195,230	00105720
TEST L	V11,V236,AR417 TEST FOR CALENDAR PMP	00122010
TEST L	V11,V236,AL421 TEST FOR CALENDAR PMP	00141410
TEST L	V11,V236,AL425 TEST FOR CALENDAR PMP	00143010
ASSIGN	07,0 ZERO JOY TIME SINCE LAST CALENDAR INSPECTION	00160310
TEST L	V11,V236,AR417 TEST FOR CALENDAR PMP	00177510
TEST L	V11,V236,AR417 TEST FOR CALENDAR PMP	00200610

TABLE XLII. HLH ALTERNATE MAINTENANCE CONCEPT C

1	0000002	5500005	0000000	20000111	00000010	000000000023000
17	00000121	0000000				00023500
2	20010616	000100				00025100
10.	FUNCTION	R41,02				00028000
0.500030	0.000055					00028500
0						00028600
0						00028700
0						00028800
50.	FUNCTION	R41,02				00103200
0.00001	0.00002					00103300
0						00103400
0						00104310
0	MAINTENANCE CONCEPT - ALTERNATE C - PHASED 100 MR P40 - POST/PRE FLIGHT					00104320
0						00104330
	INITIAL	4X1(1,2),30000/4X1(2,1),30/4X1(3,1),40/4X1(5,1),6720				00104400
	INITIAL	4X1(10,1),20/4X1(4,6),30000				00104500
	INITIAL	4X1(11,1),5				00104600
	INITIAL	4X1(1,0),40/4X1(1,0),5/4X1(1,10),5				00104700
	INITIAL	X100,41000				00104900
	INITIAL	X100,420				00105000

TABLE XLIII. HLH ALTERNATE MAINTENANCE CONCEPT D

0	CHANGES TO INCORPORATE CALENDAR INSPECTION/INTERVALS		00002710
10	VARIABLE: $(441+1000+441) \times K195$	INITIAL: DAYS SINCE PHP	00002800
11	VARIABLE: $(447+(C1/240)) \times K195$	DAYS SINCE PHP	00002900
236	VARIABLE: $K195-K196$	PHP CALENDAR WINDOW	00019910
1	00000002	5500005	0002998
17	00000121	0000009	75000011
2	20010316	200112	00000016
18	FUNCTION	441,32	75000000
0,500004	0,000045		00023400
0			00023500
0			00025100
0			00028400
0			00028500
0			00028600
0			00028700
0			00028800
50	FUNCTION	441,32	00103200
0,50001	0,00002		00103300
0			00103400
0			00103510
0	MAINT. CONCEPT ALR. D	17 WEEK PHP	00104400
	INITIAL:	$441(1,2), 220/441(2,1), 100/441(3,1), 120/441(5,1), 6720$	00104500
	INITIAL:	$441(10,1), 20/441(4,6), 35000$	00104600
	INITIAL:	$441(11,1), 3$	00104700
	INITIAL:	$441(1,8), 120/441(1,9), 5/441(1,10), 3$	00104900
	INITIAL:	$K199, <30000$	00105000
	INITIAL:	$K199, <20$	00105600
	INITIAL:	$446(16,1-3), 2000/446(16,4-6), 3000/446(16,7-10), 2000$	00105610
	INITIAL:	$446(16,11), 2030/446(17,1), 2157/446(17,2), 2121$	00105620
	INITIAL:	$446(17,3), 2105/446(17,4), 2106/446(17,5), 2147$	00105630
	INITIAL:	$446(17,6), 2138/446(17,7), 1918/446(17,8), 1915$	00105640
	INITIAL:	$446(17,9), 1932/446(17,10), 1932/446(17,11), 0402$	00105650
	INITIAL:	$446(18,1-11), 3$	001057:0
	INITIAL:	$K196, 7$	00105720
	INITIAL:	$K195, 119$	00122810
	TEST L:	V11, V236, AR417	00141410
	TEST L:	V11, V236, 4LM21	00143010
	TEST L:	V11, V236, 4LM5	00160310
	ASSIGN:	47,0	00177510
	TEST L:	V11, V236, AR417	00200610
	TEST L:	V11, V236, AR417	

APPENDIX III
RESULTS OF COMPARATIVE ANALYSES

Tables XLIV and XLV summarize the results of the CH-47C and HLH maintenance concept comparative analyses. Discussion and analysis of these data are contained in the Comparative Analysis section.

CH-47C

Twenty simulations were run for the CH-47C comparative analysis. These computer runs were typical of all maintenance concept/mission profile combinations.

HLH

Twenty simulations were run for the HLH comparative analysis. These computer runs were representative of all maintenance concept/mission profile combinations.

TABLE XLIV. CH-47 COMPARATIVE ANALYSES

BASIC MISSION: 16 AIRCRAFT, 1.5 HOURS/FLIGHT, 1512 FLIGHTS SCHEDULED					
Output Parameters	BASIC	A	B	C	D
1 Total number of missions demanded	1512	1512	1512	1512	1512
2 Total number of missions completed	1345	1432	1438	1229	1278
3 Total utilization	2017.5	2148.0	2157.0	1843.5	1917.0
4 Total number of preflight inspections	0	0	0	1318	1392
5 Total number of daily inspections	635	549	568	0	404
6 Total number of PFI inspections	67	182	1139	949	996
7 Total number of PFP inspections	19	51	2	19	7
8 Total preflight WH	0	0	0	1318.00	835.2
9 Total daily WH	3048.0	219.60	2726.4	0	808.0
10 Total PFI WH	797.3	1592.5	341.7	569.40	3984.0
11 Total PFP WH	855.0	892.5	234.0	199.50	630.0
12 Total unscheduled maintenance actions	2568	2521	2857	2548	2707
13 Total scheduled maintenance actions	55	53	33	54	114
14 Total unscheduled WH	3268.71	3219.58	3806.0	3504.35	3469.64
15 Total scheduled WH	5284.5	3382.25	3621.43	734.43	7203.23
16 Total unscheduled EMT	3531.1	4015.9	4396.1	3673.7	5117.0
17 Total scheduled EMT	621.3	1435.1	598.4	720.5	4269.2
18 Total WH/FH	4.07	2.9	3.3	2.9	5.38
19 NORM delay	4152.4	5451.0	4994.5	4393.2	9386.2
20 Total air aborts	64	71	70	59	52
21 No. maintenance actions inflight abort	65	75	71	60	52
22 No. maintenance actions at preflight	0	0	0	669	635
23 No. maintenance actions inflight	68	104	112	77	90
24 No. maintenance actions during PFI	423	1224	717	419	528
25 No. maintenance actions at daily	739	523	1803	0	920
26 No. maintenance actions at PFP	1233	595	154	1323	482
27 Personnel delays	6044	3389	1556	5091	4530
28 Malfunctions per Flight Hour	1.3	1.2	1.3	1.4	1.4
29 Availability	80.69	74.65	76.77	80.04	56.35
Index of merit	.81	.86	.86	.76	.74
I.O.M = (2/1) - (.75) + (29) - (.15) + (18) - 1 - (.10)					
Maintenance Concepts					
Basic: Daily, intermediate (25 hour PMI), periodic (100 hour PMP)					
A: Firm (daily), 10-hour inspection (PMI), phased periodic (50 hour PMP)					
B: Turnaround/servicing (PMI), daily, calendar - periodic (PMP)					
C: Preflight, postflight (PMI), phased inspection (PMP)					
D: Preflight, postflight (PMI), daily, calendar - periodic (PMP)					

TABLE XLIV. Continued					
MISSION 1: 16 AIRCRAFT, 1.5 HOURS/FLIGHT, 3920 FLIGHTS SCHEDULED					
Output Parameters	BASIC	A	B	C	D
1 Total number of missions demanded	3920	3920	3920	3920	3920
2 Total number of missions completed	2289	2385	2398	2602	1713
3 Total utilization	3433.5	3577.5	3597.0	3903	2569
4 Total number of preflight inspections	0	0	0	2774	1803
5 Total number of daily inspections	416	678	446	0	390
6 Total number of PMI inspections	111	307	1859	1990	1324
7 Total number of PMP inspections	33	77	2	40	7
8 Total preflight WH	0	0	0	2774	1081.8
9 Total daily WH	1996.8	271.2	2140.8	0	780.0
10 Total PMI WH	1320.9	2686.25	557.7	1194	5296.0
11 Total PMP WH	1485.0	1347.50	234.0	420	630.0
12 Total unscheduled maintenance actions	4382	4322	4956	4703	3500
13 Total scheduled maintenance actions	84	78	33	101	114
14 Total unscheduled WH	5845.17	5829.81	6458.52	6316.65	4359.94
15 Total scheduled WH	6080.11	5334.66	3459.82	5373.74	8941.95
16 Total unscheduled EMT	7746.9	8331.7	9124.3	5614.0	5926.2
17 Total scheduled EMT	1392.9	2817.9	1620.0	4265.7	6230.0
18 Total WH/PH	3.3	3.0	2.7	2.87	5.02
19 NORM delay	9139.8	11149.6	10744.3	9879.7	12156.2
20 Total air aborts	109	113	120	119	68
21 No. maintenance actions inflight abort	110	118	120	121	68
22 No. maintenance actions at preflight	0	0	0	671	813
23 No. maintenance actions inflight	177	172	171	179	135
24 No. maintenance actions during PMI	743	2018	2954	959	725
25 No. maintenance actions at daily	1011	539	1547	0	1367
26 No. maintenance actions at PMP	2341	1475	164	2773	392
27 Personnel delays	7701	6951	3841	8499	6715
28 Malfunctions per Flight Hour	1.3	1.2	1.4	1.2	1.4
29 Availability	57.49	48.15	50.03	54.05	43.47
Index of merit	.55	.56	.57	.61	.41
$I.O.M = (2/1) - (.75) + (30) - (.15) + (18) - 1 - (.10)$					
Maintenance Concepts					
Basic: Daily, intermediate (25 hour PMI), periodic (100 hour PMP)					
A: Firm (daily), 10-hour inspection (PMI), phased periodic (50 hour PMP)					
B: Turnaround/servicing (PMP), daily, calendar - periodic (PMP)					
C: Preflight, postflight (PMI), phased inspection (PMP)					
D: Preflight, postflight (PMI), daily, calendar - periodic (PMP)					

TABLE XLIV. Continued					
MISSION 2: 11 AIRCRAFT, 1.5 HOURS/FLIGHT, 504 FLIGHTS SCHEDULED					
Output Parameters	BASIC	A	B	C	D
1 Total number of missions demanded	504	504	504	504	504
2 Total number of missions completed	473	483	477	483	470
3 Total utilization	709.5	724.5	715.5	724.5	705
4 Total number of preflight inspections	0	0	0	517	496
5 Total number of daily inspections	371	264	502	0	335
6 Total number of PMI inspections	21	63	373	379	366
7 Total number of PMP inspections	10	19	2	10	6
8 Total preflight WPH	0	0	0	517.00	297.6
9 Total daily WPH	1780.8	105.6	2409.6	0	670.0
10 Total PMI WPH	249.9	551.25	111.9	227.4	1464.0
11 Total PMP WPH	450.0	332.50	234.0	105.0	540.0
12 Total unscheduled maintenance actions	1078	853	976	900	953
13 Total scheduled maintenance actions	37	22	33	37	98
14 Total unscheduled WPH	1478.3	1130.57	1342.03	1286.27	1273.03
15 Total scheduled WPH	2881.47	1150.57	3160.0	1343.15	4101.62
16 Total unscheduled EMT	791.2	859.7	1980.1	1837.8	1416.4
17 Total scheduled EMT	190.7	563.5	201.0	210.8	1120.9
18 Total WPH/FH	5.85	3.0	6.07	3.5	7.38
19 NRP delay	981.9	1423.2	2181.1	2048.6	2537.3
20 Total air starts	28	21	25	21	20
21 No. maintenance actions inflight abort	28	22	25	21	20
22 No. maintenance actions at preflight	0	0	0	31	120
23 No. maintenance actions inflight	31	34	22	27	34
24 No. maintenance actions during PMI	134	407	272	91	119
25 No. maintenance actions at daily	135	180	503	0	218
26 No. maintenance actions at PMP	750	210	154	730	442
27 Personnel delays	2216	661	771	1582	1709
28 Malfunctions per flight hour	1.5	1.2	1.4	1.2	1.4
29 Availability	93.35	90.37	85.24	86.14	82.83
Index of merit	.86	.89	.85	.88	.84
$I.O.M = (2/1) - (.75) + (29) - (.15) + (18) - 1 - (.10)$					
Maintenance Concepts					
Basic: Daily, intermediate (25 hour PMI), periodic (100 hour PMP)					
A: Firm (daily), 10-hour inspection (PMI), phased periodic (50 hour PMP)					
B: Turnaround/servicing (PMP), daily, calendar - periodic (PMP)					
C: Preflight, postflight (PMI), phased inspection (PMP)					
D: Preflight, postflight (PMI), daily, calendar - periodic (PMP)					

TABLE XLIV. Continued

MISSION 3: 3 AIRCRAFT, 1.5 HOURS/FLIGHT,
560 FLIGHTS SCHEDULED

Output Parameters	BASIC	A	B	C	D	Maintenance Concept
1 Total number of missions demanded	560	560	560	560	560	
2 Total number of missions completed	431	485	464	499	386	
3 Total utilization	676.5	727.5	696	748.5	579	
4 Total number of preflight inspections	0	0	0	533	408	
5 Total number of daily inspections	104	136	113	0	116	
6 Total number of PMI inspections	23	52	352	383	300	
7 Total number of PMP inspections	6	15	1	8	1	
8 Total preflight MPH	0	0	0	533.0	244.8	
9 Total daily MPH	499.2	54.4	542.4	0	232.0	
10 Total PMI MPH	273.7	542.5	105.0	229.8	1200.0	
11 Total PMP MPH	270.0	262.5	117.0	84.0	90.00	
12 Total unscheduled maintenance actions	939	882	833	1003	668	
13 Total scheduled maintenance actions	15	15	16	18	16	
14 Total unscheduled MPH	1149.14	1225.71	1180.06	1278.28	988.28	
15 Total scheduled MPH	1142.14	993.38	947.39	1028.92	1950.76	
16 Total unscheduled EMT	674.5	1076.6	1058.3	864.5	1006.4	
17 Total scheduled EMT	203.0	529.9	235.6	446.9	860.9	
18 Total MPH/PM	3.3	2.9	3.0	3.0	4.91	
19 NMAW delay	877.5	1606.5	1293.9	1311.4	1867.3	
20 Total air aborts	20	21	15	19	17	
21 No. maintenance actions inflight abort	20	22	15	20	17	
22 No. maintenance actions at preflight	0	0	0	286	91	
23 No. maintenance actions inflight	33	23	24	32	22	
24 No. maintenance actions during PMP	156	409	350	111	209	
25 No. maintenance actions at daily	238	193	377	0	242	
26 No. maintenance actions at PMP	492	235	67	556	87	
27 Personnel delays	1056	623	343	1173	456	
28 Malfunctions per Flight Hour	1.4	1.2	1.2	1.3	1.2	
29 Availability	78.23	60.15	67.9	67.47	53.68	
Index of merit	.75	.77	.76	.81	.62	
$I.O.M = (2/1) \cdot (.75) + (29) \cdot (.15) + (18) \cdot (-1) \cdot (.10)$						

Maintenance Concepts

- Basic: Daily, intermediate (25 hour PMI), periodic (100 hour PMP)
 A: Firm (daily), 10-hour inspection (PMI), phased periodic (50 hour PMP)
 B: Turnaround/servicing (PMI), daily, calendar - periodic (PMP)
 C: Preflight, postflight (PMI), phased inspection (PMP)
 D: Preflight, postflight (PMI), daily, calendar - periodic (PMP)

TABLE XLV. HLH COMPARATIVE ANALYSES

		BASIC MISSION: 9 AIRCRAFT, 2.0 HOURS/FLIGHT, 504 FLIGHTS SCHEDULED					
Output Parameters		BASIC	A	B	C	D	Maintenance Concept
1	Total number of missions demanded	504	504	504	504	504	
2	Total number of missions completed	492	451	463	489	474	
3	Total utilization	984	902	926	978.0	948	
4	Total number of preflight inspections	0	0	0	565	548	
5	Total number of daily inspections	294	412	340	0	367	
6	Total number of PwI inspections	88	29	472	554	483	
7	Total number of PwP inspections	20	10	2	9	6	
8	Total preflight WPH	0	0	0	678.0	548.0	
9	Total daily WPH	176.4	2472.00	884.0	0	880.8	
10	Total PwI WPH	880.0	464.0	283.2	554	483.0	
11	Total PwP WPH	400.0	640.0	300	108.0	720.0	
12	Total unscheduled maintenance actions	367	1144	1266	1000	824	
13	Total scheduled maintenance actions	0	0	0	0	0	
14	Total unscheduled WPH	3971.0	4265.6	5541.7	3673.0	3845.5	
15	Total scheduled WPH	1456.4	3576.0	1467.2	1340.0	2631.8	
16	Total unscheduled EMT	1152.4	1231.7	2079.9	1245.0	1394.0	
17	Total scheduled EMT	1011.9	880.8	1536.8	1425.9	1609.5	
18	Total WPH/PH	5.25	8.63	7.42	4.97	6.65	
19	NORM delay	2196.3	2112.3	3616.7	2670.9	2943.5	
20	Total air aborts	12	9	14	11	13	
21	No. maintenance actions inflight abort	14	11	14	11	13	
22	No. maintenance actions at preflight	0	0	0	259	231	
23	No. maintenance actions inflight	41	50	43	54	33	
24	No. maintenance actions during PwI	470	436	843	286	172	
25	No. maintenance actions at daily	103	152	265	0	109	
26	No. maintenance actions at PwP	359	495	101	390	266	
27	Personnel delays	1759	2878	1942	1564	1934	
28	Malfunctions per Flight Hour	1.00	1.27	1.37	1.02	.87	
29	Availability	81.85	82.53	70.10	77.91	75.66	
Index of merit		.87	.81	.81	.86	.83	
		$I.O.M. = (2/1) \cdot (.75) + (29) \cdot (.15) + (18) \cdot (-1) \cdot (.10)$					
HLH Maintenance Concepts							
Basic: Firm (daily), 10-hour inspection, 50 hour phased periodic							
A: Daily, intermediate (25 hour PMI), periodic (100 hour PMP)							
B: Turnaround/servicing (PMI), daily, calendar periodic (34 weeks PMP)							
C: Preflight, postflight (PMI), phased inspection (100 hours PMP)							
D: Preflight, postflight (PMI), daily, calendar periodic (17 weeks PMP)							

TABLE XLV. Continued

MISSION 1: 3 AIRCRAFT, 2.0 HOURS/FLIGHT, 560 FLIGHTS SCHEDULED						
Output Parameters						
	BASIC	A	B	C	D	Maintenance Concept
1 Total number of missions demanded	560	560	560	560	560	560
2 Total number of missions completed	354	390	367	326	326	326
3 Total utilization	708	780	734	652	652	652
4 Total number of preflight inspections	0	0	0	339	354	354
5 Total number of daily inspections	112	115	141	0	141	141
6 Total number of PMI inspections	62	25	370	329	347	347
7 Total number of PMP inspections	15	8	0	6	0	0
8 Total preflight $\frac{PMI}{PMI}$	0	0	0	406.8	354	354
9 Total daily $\frac{PMI}{PMI}$	67.2	690	366.6	0	338.4	338.4
10 Total PMI $\frac{PMI}{PMI}$	620.0	400.0	222.0	329.0	347.0	347.0
11 Total PMP $\frac{PMI}{PMI}$	300.0	512	0	72.0	0	0
12 Total unscheduled maintenance actions	732	893	807	719	628	628
13 Total scheduled maintenance actions	0	0	0	0	0	0
14 Total unscheduled $\frac{PMI}{PMI}$	3089.2	3479.8	3273.0	3031.4	2643.7	2643.7
15 Total scheduled $\frac{PMI}{PMI}$	987.2	1602.0	588.6	807.8	1039.4	1039.4
16 Total unscheduled EMT	837.5	843.8	944.2	896.3	752.3	752.3
17 Total scheduled EMT	468.4	333.9	217.7	287.6	209.6	209.6
18 Total $\frac{PMI}{PMI}/PH$	5.45	6.31	5.23	5.72	5.27	5.27
19 NORM delay	1305.9	1177.7	1161.9	1183.9	961.9	961.9
20 Total air aborts	11	9	4	7	10	10
21 No. maintenance actions inflight abort	12	9	4	7	10	10
22 No. maintenance actions at preflight	0	0	0	156	149	149
23 No. maintenance actions inflight	36	39	42	32	45	45
24 No. maintenance actions during PMI	352	387	653	278	385	385
25 No. maintenance actions at daily	46	51	108	0	39	39
26 No. maintenance actions at PMP	286	407	0	246	0	0
27 Personnel delays	1111	1818	247	668	243	243
28 Malfunctions per Flight Hour	1.03	1.14	1.10	1.10	1.10	1.10
29 Availability	67.61	70.79	71.18	70.63	76.14	76.14
Index of merit	.59	.64	.62	.56	.59	.59
$I.O.M. = (2/1) \cdot (.75) + (29) \cdot (.15) + (18) \cdot (-1) \cdot (.10)$						
HLH Maintenance Concepts						
Basic: Firm (daily), 10-hour inspection, 50 hour phased periodic						
A: Daily, intermediate (25 hour PMI), periodic (100 hour PMP)						
B: Turnaround/servicing (PMI), daily, calendar periodic (34 weeks PMP)						
C: Preflight, postflight (PMI), phased inspection (100 hours PMP)						
D: Preflight, postflight (PMI), daily, calendar periodic (17 weeks PMP)						

TABLE XLV. Continued					
MISSION 2: 9 AIRCRAFT, 2.0 HOURS/FLIGHT, 336 FLIGHTS SCHEDULED					
Output Parameters	BASIC	A	B	C	D
1 Total number of missions demanded .	336	336	336	336	336
2 Total number of missions completed .	332	325	328	326	321
3 Total utilization	664	650	656	652.0	642
4 Total number of preflight inspections	0	0	0	398	394
5 Total number of daily inspections	321	346	340	0	326
6 Total number of PMI inspections	57	22	337	391	330
7 Total number of PMP inspections	16	6	2	8	6
8 Total preflight MPM	0	0	0	477.6	394
9 Total daily MPM	192.6	2076.0	884.0	0	782.4
10 Total PMI MPM	570.0	352.0	202.2	391.0	330.0
11 Total PMP MPM	320.0	384.0	300	96.0	720
12 Total unscheduled maintenance actions	657	687	814	756	673
13 Total scheduled maintenance actions	0	0	0	0	0
14 Total unscheduled MPM	2710.0	2825.3	2953.8	3286.7	2898.1
15 Total scheduled MPM	1082.6	2812.0	1386.2	964.6	2226.4
16 Total unscheduled EMT	676.3	751.3	904.0	919.6	830.9
17 Total scheduled EMT	458.4	208.5	421.6	573.5	801.2
18 Total MPM/PM	5.44	8.4	6.49	6.3	7.7
19 NORM delay	1134.7	959.8	1325.6	1493.1	1632.1
20 Total air aborts	4	9	8	8	11
21 No. maintenance actions inflight abort	4	9	8	8	11
22 No. maintenance actions at preflight	0	0	0	172	174
23 No. maintenance actions inflight	32	20	41	25	21
24 No. maintenance actions during PMI	305	346	398	174	111
25 No. maintenance actions at daily	16	26	266	0	92
26 No. maintenance actions at PMP	300	286	101	377	264
27 Personnel delays	1241	1715	1098	1134	1283
28 Malfunctions per Flight Hour	.99	1.06	1.24	1.16	1.05
29 Availability	90.61	92.06	89.04	87.65	86.5
Index of merit	.89	.88	.88	.88	.86
$I.O.M. = (2/1) \cdot (.75) + (29) \cdot (.15) + (18) \cdot (-1) \cdot (.10)$					
HLH Maintenance Concepts Basic: Firm (daily), 10-hour inspection, 50 hour phased periodic A: Daily, intermediate (25 hour PMI), periodic (100 hour PMP) B: Turnaround/servicing (PMI), daily, calendar periodic (34 weeks PMP) C: Preflight, postflight (PMI), phased inspection (100 hours PMP) D: Preflight, postflight (PMI), daily, calendar periodic (17 weeks PMP)					

TABLE XLV. Continued

MISSION 3: 9 AIRCRAFT, 5.0 HOURS/FLIGHT, 1120 FLIGHTS SCHEDULED					
Output Parameters	BASIC	A	B	C	D
1 Total number of missions demanded	1120	1120	1120	1120	1120
2 Total number of missions completed	421	360	348	445	445
3 Total utilization	2105	1800	1840	2225	2225
4 Total number of preflight inspections	0	0	0	480	483
5 Total number of daily inspections	159	167	125	0	204
6 Total number of PMP inspections	193	61	376	451	453
7 Total number of PMP inspections	47	2	2	23	6
8 Total preflight $\frac{WH}{PH}$	0	0	0	576.0	483
9 Total daily $\frac{WH}{PH}$	95.4	1002.0	325.0	0	489.6
10 Total PMP $\frac{WH}{PH}$	1930.0	976.0	225.6	451.0	453.0
11 Total PMP $\frac{WH}{PH}$	940.0	1280.0	300	276.0	720.0
12 Total unscheduled maintenance actions	1999	1885	2303	2465	1907
13 Total scheduled maintenance actions	0	0	0	0	0
14 Total unscheduled $\frac{WH}{PH}$	6765.7	6953.0	9431.2	8109.4	7471.1
15 Total scheduled $\frac{WH}{PH}$	2965.4	3258.0	850.6	1303.0	2145.6
16 Total unscheduled $\frac{WH}{PH}$	2881.0	2220.3	4879.2	3022.8	3068.4
17 Total scheduled $\frac{WH}{PH}$	4240.1	4927.2	3246.2	2845.3	3255.4
18 Total $\frac{WH}{PH}/PH$	4.14	5.37	5.49	3.99	4.2
19 $\frac{WH}{PH}$ delay	7121.1	7147.5	8125.4	5868.1	6323.8
20 Total air aborts	6	8	11	13	14
21 No. maintenance actions inflight abort	8	8	11	14	14
22 No. maintenance actions at preflight	0	0	0	211	231
23 No. maintenance actions inflight	38	30	31	51	37
24 No. maintenance actions during PMP	1012	909	1578	1126	525
25 No. maintenance actions at daily	61	58	632	0	833
26 No. maintenance actions at PMP	880	880	51	1063	267
27 Personnel delays	4602	4951	5222	5230	4659
28 Malfunctions per Flight Hour	.95	1.05	1.25	1.11	1.17
29 Availability	41.15	40.91	32.82	51.5	47.71
Index of merit	.37	.32	.30	.40	.39
$I.O.M. = (2/1) \cdot (.75) + (29) \cdot (.15) + (18) \cdot (-1) \cdot (-.10)$					
HLH Maintenance Concepts Basic: Firm (daily), 10-hour inspection, 50 hour phased periodic A: Daily, intermediate (25 hour PMI), periodic (100 hour PMP) B: Turnaround/servicing (PMI), daily, calendar periodic (34 weeks PMP) C: Preflight, postflight (PMI), phased inspection (100 hours PMP) D: Preflight, postflight (PMI), daily, calendar periodic (17 weeks PMP)					

APPENDIX IV
CH-47C R&M INPUT DATA BASE

Tables XLVI through LVI have been employed in the development of the R&M function tables of the CH47C R&M simulation model.

Included in the data presented in this appendix are all primary and non-primary malfunctions, encountered against the various CH-47C components/subsystems, as well as the maintenance actions against each system. Maintenance actions include things like visual checks and walk around safety checks, which are frequently not accounted as maintenance against a component. Furthermore these tasks do not in themselves impart aircraft operations.

The total malfunction rate used in the simulation excluded maintenance actions. Thus malfunctions are generated at a rate of approximately 1.3 per flight hour.

TABLE XLVI. CH-47C INPUT DATA - AIRFRAME SYSTEM

Subsystem Name	WUC	Task Type	Fail Rate 1000 hr	MMH/ Task	Crew Size	ENT	Mission Affecting Rate	NORS Delay
Access panels and doors	0101	On aircraft repair	6.7761	1.62	1	1.62	-	-
		Unsched. removal & replace.	3.6300	1.38	1.2	1.15	-	-
		Scheduled removal	-	-	-	-	-	-
Armor and armament	0102	On aircraft repair	2.4200	0.44	1	0.44	-	-
		Unsched. removal & replace.	0.2420	0.25	1	0.25	-	-
		Scheduled removal	-	-	-	-	-	-
Basic structure	0103	On aircraft repair	107.9329	2.31	1	2.31	-	-
		Unsched. removal & replace.	30.7342	0.90	3.1	0.29	.4840	-
		Scheduled removal	-	-	-	-	-	-
Cargo ramp, door and actuating mechanisms	0104	On aircraft repair	8.7121	1.51	1	1.51	-	-
		Unsched. removal & replace.	2.4200	1.18	2.4	0.49	-	-
		Scheduled removal	-	-	-	-	-	-
Console and instrument panel	0105	On aircraft repair	1.2100	0.40	1	0.40	-	-
		Unsched. removal & replace.	0.2420	1.70	3.4	0.50	-	-
		Scheduled removal	-	-	-	-	-	-
Dynamic absorbers	0106	On aircraft repair	0.2420	0.33	1	0.33	-	-
		Unsched. removal & replace.	3.6300	5.08	1	5.08	.2420	.2420
		Scheduled removal	-	-	-	-	-	-
Entrance doors	0107	On aircraft repair	9.1961	0.81	1	0.81	-	-
		Unsched. removal & replace.	1.6940	0.59	2.7	0.22	-	-
		Scheduled removal	-	-	-	-	-	-
Fairings and cowling	0108	On aircraft repair	116.8842	1.54	1	1.54	-	-
		Unsched. removal & replace.	68.4898	0.59	1.5	0.39	-	-
		Scheduled removal	-	-	-	-	-	-
Flooring	0109	On aircraft repair	7.9861	0.48	1	0.48	-	-
		Unsched. removal & replace.	0.9680	2.05	2.2	0.93	-	-
		Scheduled removal	-	-	-	-	-	-
Hatches	0110	On aircraft repair	2.4200	0.22	1	0.22	-	-
		Unsched. removal & replace.	1.4520	0.70	1.6	0.44	-	-
		Scheduled removal	-	-	-	-	-	-
Window assemblies	0111	On aircraft repair	9.6801	0.39	1	0.39	-	-
		Unsched. removal & replace.	6.5140	3.19	1	3.19	-	-
		Scheduled removal	-	-	-	-	-	-
Work platforms	0112	On aircraft repair	33.6383	0.82	1	0.82	-	-
		Unsched. removal & replace.	15.4881	1.63	1.9	0.86	-	-
		Scheduled removal	-	-	-	-	-	-
Maintenance actions	0113	On aircraft repair	220.4637	0.80	1	0.80	-	-
		Unsched. removal & replace.	4.3560	1.08	1.3	0.83	-	-
		Scheduled removal	-	-	-	-	-	-

TABLE XLVII. CH-47C INPUT DATA - COMMUNICATIONS AND NAVIGATION SYSTEM									
Subsystem Name	WUC	Task Type	Fail Rate 1000 hr	MMH/ Task	Crew Size	ENT	Mission Affecting Rate	NORS Rate	
ADF	0201	On aircraft repair Unsched. removal & replace. Scheduled removal	0.2420	0.33	1.3	0.25	-	-	-
HF communications	0202	On aircraft repair Unsched. removal & replace. Scheduled removal	0.7260 4.8400	0.50 1.43	1 1.4	0.50 1.02	-	-	-
IFF	0203	On aircraft repair Unsched. removal & replace. Scheduled removal	1.2100 2.1780	0.72 0.68	1 1.2	0.72 0.57	-	-	-
Interphone	0204	On aircraft repair Unsched. removal & replace. Scheduled removal	4.3561 3.3880	0.88 0.81	1 2.3	0.88 0.35	-	-	-
Liaison	0205	On aircraft repair Unsched. removal & replace. Scheduled removal	1.2100 1.6940	0.73 1.46	1 1.5	0.73 0.97	-	-	-
Marker beacon	0206	On aircraft repair Unsched. removal & replace. Scheduled removal	0.7260 0.2420	0.42 0.43	1 2.5	0.42 0.17	-	-	-
OMNI (VOR)	0207	On aircraft repair Unsched. removal & replace. Scheduled removal	2.4200	0.69	1	0.69	-	-	-
Remote compass	0208	On aircraft repair Unsched. removal & replace. Scheduled removal	0.2420 0.7260	1.00 1.00	1 1.5	1.00 0.67	-	-	-
UHF communication	0209	On aircraft repair Unsched. removal & replace. Scheduled removal	0.7260 5.3240	0.67 0.91	1 1.4	0.67 0.65	-	-	-
VGI	0210	On aircraft repair Unsched. removal & replace. Scheduled removal	0.4840	0.98	1.3	0.75	-	-	-
Maintenance actions	0211	On aircraft repair Unsched. removal & replace Scheduled removal	20.3282 7.7441	0.64 0.68	1 2.5	0.64 0.27	-	-	-

TABLE XLVIII. CH-47C INPUT DATA - DRIVE SYSTEM									
Subsystem Name	WUC	Task Type	Fail Rate 1000 hr	MM/Task	Crew Size	EXT	Mission Affecting Rate	MORS Rate	
Lubrication	0301	On aircraft repair Unscheduled. removal & replace. Scheduled removal	3.3880 14.7621 -	1.44 1.78 -	1 1.4 -	1.44 1.27 -	.9680	.2420	
Mounts and supports	0302	On aircraft repair Unscheduled. removal & replace. Scheduled removal	0.9680 116.4029 0.9680	0.50 0.92 8.75	1 1.4 1.4	0.50 0.66 6.25	.2420	-	
Shafting	0303	On aircraft repair Unscheduled. removal & replace. Scheduled removal	3.3880 6.5341 0.2420	0.32 4.85 0.48	1 1.9 1.9	0.32 2.55 0.25	.4840	-	
Miscellaneous transmissions	0304	On aircraft repair Unscheduled. removal & replace. Scheduled removal	2.9040 8.4701 -	0.53 1.65 -	1 1.7 -	0.53 0.97 -	3.3880	-	
Maintenance actions	0305	On aircraft repair Unscheduled. removal & replace. Scheduled removal	35.4185 -	0.57 -	2 -	0.29 -	-	-	
Shaft assembly forward 114D3052-7	0306	On aircraft repair Unscheduled. removal & replace. Scheduled removal	0.2420 -	0.33 -	1 -	0.33 -	-	-	
Shaft assembly sync #2	0307	On aircraft repair Unscheduled. removal & replace. Scheduled removal	0.2420 -	0.50 -	1 -	0.50 -	-	-	
Shaft assembly sync #3	0308	On aircraft repair Unscheduled. removal & replace. Scheduled removal	0.2420 0.2420 -	0.33 1.33 -	1 1.9 -	0.33 0.70 -	-	-	
Shaft assembly sync #3 maintenance action.	0309	On aircraft repair Unscheduled. removal & replace. Scheduled removal	0.7260 -	0.78 -	2 -	0.39 -	-	-	
Shaft assembly sync #4	0310	On aircraft repair Unscheduled. removal & replace. Scheduled removal	0.4840 -	0.91 -	1.9 -	0.48 -	-	-	
Shaft assembly aft 114D3070-6 Rotor #8	0311	On aircraft repair Unscheduled. removal & replace. Scheduled removal	0.9680 -	3.91 -	1.9 -	2.06 -	-	-	
Shaft assembly aft #8 maintenance action	0312	On aircraft repair Unscheduled. removal & replace. Scheduled removal	0.4840 -	2.97 -	2 -	1.49 -	-	-	
Shaft assembly aft #9 114D3070-6 maintenance action	0313	On aircraft repair Unscheduled. removal & replace. Scheduled removal	0.7260 -	2.97 -	2 -	1.49 -	-	-	

TABLE XLVIII. Continued

Subsystem Name	MUC	Task Type	Fail Rate 1000 hr	Mech/Task	Crew Size	EMT	Mission Affecting Rate	MORS Rate
Shaft transmission 114D3241-08 Maintenance action	0314	On aircraft repair Unscheduled. removal & replace. Scheduled removal	0.2420	2.25	2	1.13	-	-
Shaft transmission 114D3241-09	0315	On aircraft repair Unscheduled. removal & replace. Scheduled removal	0.2420	1.25	1.9	0.66	-	-
Shaft transmission 09 Maintenance action	0316	On aircraft repair Unscheduled. removal & replace. Scheduled removal	0.2420	3.40	2	1.70	-	-
Shaft, RH engine dis 114D3247-1 Maintenance action	0317	On aircraft repair Unscheduled. removal & replace. Scheduled removal	0.9680	3.46	2	1.73	-	-
Shaft assembly, aft rotor 114D3250-1	0318	On aircraft repair Unscheduled. removal & replace. Scheduled removal	0.2420	19.76	1.9	10.40	-	-
Shaft assembly, aft rotor, 114D3250-1 Maintenance action	0319	On aircraft repair Unscheduled. removal & replace. Scheduled removal	0.7260	0.44	2	0.22	-	-
Shaft assembly, aft rotor 114D3053-4	0320	On aircraft repair Unscheduled. removal & replace. Scheduled removal	0.4840	2.15	1.9	1.13	-	-
Shaft assembly, aft 114D3053-4 Maintenance action	0321	On aircraft repair Unscheduled. removal & replace. Scheduled removal	1.2100	0.27	2	0.14	-	-
Adapter splined 114D3242-1	0322	On aircraft repair Unscheduled. removal & replace. Scheduled removal	0.2420	5.00	1.9	2.63	-	-
Adapter splined 114D3242-1 Maintenance action	0323	On aircraft repair Unscheduled. removal & replace. Scheduled removal	0.2420	0.08	2	0.04	-	-
Adapter shaft L/H engine 114D3245-1	0324	On aircraft repair Unscheduled. removal & replace. Scheduled removal	0.2420	0.50	1	0.50	-	-
Adapter shaft L/H engine Maintenance action	0325	On aircraft repair Unscheduled. removal & replace. Scheduled removal	0.2420	0.25	2	0.13	-	-
Transmission assembly forward 114D1200-3	0326	On aircraft repair Unscheduled. removal & replace. Scheduled removal	0.9680	24.05	1.7	14.62	-	-

TABLE XLVIII. Continued

Subsystem Name	W/C	Task Type	Fail Rate 1000 hr	MMH/ Tact	Crew Size	EMT	Mission Affecting Rate	NORS Rate
Transmission assembly 0327 forward 114D1200-3 Maintenance action		On aircraft repair Unsched. removal & replace. Scheduled removal	3.3080	4.58	2	2.29	-	-
Transmission, aft 114D2200-5	0328	On aircraft repair Unsched. removal & replace. Scheduled removal	0.4840	48.03	1.7	28.25	-	-
Transmission, aft 114D2200-5 Maintenance action	0329	On aircraft repair Unsched. removal & replace. Scheduled removal	6.7761	1.10	2	0.55	-	-
Transmission, comp. 114D5200-1	0330	On aircraft repair Unsched. removal & replace Scheduled removal	0.9680	15.88	1.7	9.34	-	-
Transmission, comp. 114D5200-1 Maintenance action	0331	On aircraft repair Unsched. removal & replace. Scheduled removal	3.1460	0.71	2	0.36	-	-
Transmission assembly 114D6200-1 LH	0332	On aircraft repair Unsched. removal & replace. Scheduled removal	1.4520	9.00	1.7	5.29	-	-
Transmission assembly 0333 114D6200-1, LH Maintenance action		On aircraft repair Unsched. removal & replace. Scheduled removal	0.7260	0.27	2	0.14	-	-
Transmission assembly 0334 114D6200-1, RH		On aircraft repair Unsched. removal & replace Scheduled removal	2.9040	6.44	1.7	3.79	-	-
Transmission assembly 0335 114D6200-1, RH Maintenance action		On aircraft repair Unsched. removal & replace Scheduled removal	0.9680	0.41	2	0.21	-	-
Transmission assembly 0336 114D6200-2, LH Maintenance action		On aircraft repair Unsched. removal & replace. Scheduled removal	0.0001	3.33	1.7	1.96	-	-
Transmission assembly 0337 114D6200-2, LH Maintenance action		On aircraft repair Unsched. removal & replace. Scheduled removal	2.4200	0.65	2	0.33	-	-
Transmission assembly 0338 114D6200-2, PH Maintenance action		On aircraft repair Unsched. removal & replace. Scheduled removal	0.2420	2.50	2	1.25	-	-
Transmission assembly 0339 114D6200-2 Maintenance action		On aircraft repair Unsched. removal & replace Scheduled removal	0.0001	3.43	1.7	2.02	-	-
Transmission assembly 0339 114D6200-2 Maintenance action		On aircraft repair Unsched. removal & replace Scheduled removal	4.3560	0.70	2	0.35	-	-
Transmission assembly 0339 114D6200-2 Maintenance action		On aircraft repair Unsched. removal & replace Scheduled removal	0.4840	2.25	2	1.13	-	-

TABLE XLVIII. Continued									
Subsystem Name	WUC	Task Type	Fail Rate 1000 hr	MWH/ Task	Crew Size	ZMT	Mission Affecting Rate	NORS Rate	
Shaft, quill engine 114D6263-1	0340	On aircraft repair Unsched. removal & replace. Scheduled removal	- 0.4840 -	- 0.65 -	- 1.7 -	- 0.38 -	-	-	-
Shaft assembly, forward, 114R3052-7 Maintenance action	0341	On aircraft repair Unsched. removal & replace. Scheduled removal	- 0.2420 -	- 0.30 -	2 - -	0.15 - -	-	-	-
Shaft assembly, sync 114D3048-7 Maintenance action	0342	On aircraft repair Unsched. removal & replace. Scheduled removal	- 0.0001 -	- 1.09 -	- 1.7 -	- 0.64 -	-	-	-
Shaft assembly, aft 114D3070-6, A8 Maintenance action	0343	On aircraft repair Unsched. removal & replace. Scheduled removal	- 0.0001 -	- 1.36 -	- 1.7 -	- 0.80 -	-	-	-
Shaft transmission 114D3241 Maintenance action	0344	On aircraft repair Unsched. removal & replace. Scheduled removal	- 0.0001 -	- 1.28 -	- 1.7 -	- 0.75 -	-	-	-
Shaft assembly, aft rotor, 114D3250-1 Maintenance action	0345	On aircraft repair Unsched. removal & replace. Scheduled removal	- 0.7260 -	- 14.43 -	2 - -	7.22 - -	-	-	-
Adapter assembly, forward drive 114D3067-3 Maintenance action	0346	On aircraft repair Unsched. removal & replace. Scheduled removal	- 0.0001 -	- 2.84 -	- 1.7 -	- 1.67 -	-	-	-
Adapter, shaft transmission 114D3243-1	0347	On aircraft repair Unsched. removal & replace. Scheduled removal	- 0.0001 -	- 1.70 -	- 1.7 -	- 1.00 -	-	-	-
Transmission, forward 114D1200-3 Maintenance action	0348	On aircraft repair Unsched. removal & replace. Scheduled removal	- 0.0001 -	- 19.69 -	- 1.7 -	- 11.58 -	-	-	-
Transmission, aft 114D2200-5 Maintenance action	0349	On aircraft repair Unsched. removal & replace. Scheduled removal	- 0.0001 -	- 17.92 -	- 1.7 -	- 10.54 -	-	-	-
Transmission, comb 114D5200-1 Maintenance action	0350	On aircraft repair Unsched. removal & replace. Scheduled removal	- 0.0001 -	- 20.32 -	- 1.7 -	- 11.95 -	-	-	-
Transmission engine 114D6200-2 Maintenance action	0351	On aircraft repair Unsched. removal & replace. Scheduled removal	- 0.7260 -	- 3.53 -	2 - -	1.77 - -	-	-	-

TABLE XLIX. CH-47C INPUT DATA - ELECTRICAL SYSTEM

Subsystem Name	WUC	Task Type	Fail Rate 1000 hr	MMH/ Task	Crew Size	EMT	Mission Affecting Rate	NORS Rate
AC power supply and distribution	0401	On aircraft repair Unscheduled, removal & replace. Scheduled removal	2.6621 4.5980 -	1.04 0.80 -	1 1.4 -	1.04 0.57 -	-	-
Cabin and ramp lighting	0402	On aircraft repair Unscheduled, removal & replace. Scheduled removal	0.4840 0.9680 -	0.29 0.38 -	1 1.3 -	0.29 0.29 -	-	-
Cockpit lighting	0403	On aircraft repair Unscheduled, removal & replace. Scheduled removal	1.2100 0.9680 -	0.28 0.35 -	1 1.2 -	0.28 0.29 -	-	-
Console lighting	0404	On aircraft repair Unscheduled, removal & replace. Scheduled removal	- 0.7260 -	- 0.08 -	- 1.5 -	- 0.05 -	-	-
DC power supply and distribution	0405	On aircraft repair Unscheduled, removal & replace. Scheduled removal	0.7260 1.6940 0.2420	0.70 0.32 0.60	1 1.5 1.5	0.70 0.21 0.40	.9680	1.4520
Formation lights	0406	On aircraft repair Unscheduled, removal & replace. Scheduled removal	7.2601 1.9360 -	0.40 0.44 -	1 2.9 -	0.40 0.15 -	-	-
Inspection lighting	0407	On aircraft repair Unscheduled, removal & replace. Scheduled removal	2.1781 6.5340 -	0.64 0.21 -	1 1.3 -	0.64 0.16 -	-	-
Navigation lights and anti-collision	0408	On aircraft repair Unscheduled, removal & replace. Scheduled removal	0.7260 9.4381 -	1.75 0.69 -	1 1.4 -	1.75 0.49 -	-	-
Overhead panel lighting	0409	On aircraft repair Unscheduled, removal & replace. Scheduled removal	0.2420 1.4520 -	1.00 0.17 -	1 1.4 -	1.00 0.12 -	-	-
Searchlight and landing lights	0410	On aircraft repair Unscheduled, removal & replace. Scheduled removal	0.2420 3.1460 -	2.00 1.96 -	1 1.3 -	2.00 1.51 -	-	-
Troop and passenger warning	0411	On aircraft repair Unscheduled, removal & replace. Scheduled removal	0.2420 -	1.00 -	1 -	1.00 -	-	-
Wires, miscellaneous	0412	On aircraft repair Unscheduled, removal & replace. Scheduled removal	21.2962 6.0500 -	0.58 1.27 -	2 2.7 -	0.29 0.47 -	-	.2420
Maintenance actions	0413	On aircraft repair Unscheduled, removal & replace. Scheduled removal	26.1362 0.4840 -	0.56 0.50 -	2 2 -	0.28 0.25 -	-	-

TABLE L. CN-47C INPUT DATA - EQUIPMENT SYSTEM

Subsystem Name	WUC	Task Type	Fail Rate 1000 hr	MMH/ Task	Crew Size	EXT	Mission Affecting Rate	NORS Rate
APU	0501	On aircraft repair	1.2100	0.58	2	0.29		
		Unscheduled removal & replace.	2.6620	1.14	1.7	0.67	.4840	-
		Scheduled removal	0.4840	0.39	1.7	0.23		
Cargo rescue hoist	0502	On aircraft repair	2.6620	0.66	1	0.66		
		Unscheduled removal & replace. Scheduled removal	1.6940	1.45	2	0.72	-	-
Cockpit and cabin seat	0503	On aircraft repair	4.8401	1.02	1	1.02		
		Unscheduled removal & replace. Scheduled removal	2.9040	0.30	1.1	0.27	-	-
Emergency apparatus	0504	On aircraft repair	6.2921	0.24	1	0.24		
		Unscheduled removal & replace. Scheduled removal	5.0820	0.26	1	0.26	-	-
External cargo hook and towing	0505	On aircraft repair	2.4200	1.08	1	1.08		
		Unscheduled removal & replace. Scheduled removal	9.9221	1.05	1.4	0.75	-	-
Furnishings	0506	On aircraft repair	2.4200	0.98	1	0.98		
		Unscheduled removal & replace. Scheduled removal	1.9360	0.40	1.2	0.33	-	-
Heating and ventilation	0507	On aircraft repair	3.6300	0.86	1	0.86		
		Unscheduled removal & replace. Scheduled removal	2.9040	1.14	1.7	0.67	-	-
Windshield wipers and anti-icing	0508	On aircraft repair	0.2420	0.33	1	0.33		
		Unscheduled removal & replace. Scheduled removal	2.4200	0.81	1.3	0.62	-	-
Maintenance actions	0509	On aircraft repair	48.6423	0.65	1	0.65		
		Unscheduled removal & replace. Scheduled removal	1.6940	0.72	2	0.36	-	-

TABLE LI. CH-47C INPUT DATA - LANDING GEAR SYSTEM									
Subsystem Name	WUC	Task Type	Fail Rate 100C hr	MTH/ Task	Crew Size	EMT	Mission Affecting Rate	MORS Rate	
Fitting and braces	0601	On aircraft repair Unsched. removal & replace. Scheduled removal	2.6620 0.7260 -	0.36 0.11 -	1 1 -	0.36 0.21 -	-	-	
Power steering	0602	On aircraft repair Unsched. removal & replace. Scheduled removal	0.2420 - -	0.33 - -	2 - -	0.16 - -	-	-	
Shock struts	0603	On aircraft repair Unsched. removal & replace. Scheduled removal	0.4840 0.7420 -	0.33 2.30 -	2 1.9 -	0.17 1.21 -	-	-	
Swivel lock system	0604	On aircraft repair Unsched. removal & replace. Scheduled removal	1.9360 3.3880 -	1.56 2.84 -	1 1.2 -	1.56 2.37 -	-	-	
Wheel assemblies	0605	On aircraft repair Unsched. removal & replace. Scheduled removal	0.4840 4.3560 -	0.14 2.84 -	1 1.5 -	0.14 1.89 -	-	-	
Wheels and parking brake system	0606	On aircraft repair Unsched. removal & replace. Scheduled removal	1.2100 4.114 -	1.13 4.10 -	1 1.5 -	1.13 0.73 -	-	-	
Maintenance actions	0607	On aircraft repair Unsched. removal & replace. Scheduled removal	24.2002 - -	0.31 - -	1 - -	0.31 - -	-	-	

TABLE L11. CH-47C INPUT DATA - FLIGHT CONTROL SYSTEM

Subsystem Name	WUC	Task Type	Fail Rate 1000 hr	MMU/ Task	Crew Size	EMT	Mission	
							Affecting Rate	NORS Rate
Dungees and dampers	0701	On aircraft repair	0.2420	1.04	1.3	0.80	-	-
		Unsched. removal & replace. Scheduled removal						
Cockpit controls	0702	On aircraft repair	0.4840	1.00	1	1.00	-	-
		Unsched. removal & replace. Scheduled removal						
First stage mixing	0703	On aircraft repair	0.2420	0.75	1	0.75	.2420	-
		Unsched. removal & replace. Scheduled removal						
Hydraulic boost	0704	On aircraft repair	4.5981	0.75	2	0.37	-	-
		Unsched. removal & replace. Scheduled removal						
Magnetic brake and centering spring	0705	On aircraft repair	0.4840	0.59	2	0.29	.2420	-
		Unsched. removal & replace. Scheduled removal						
Pedals and positioning system	0706	On aircraft repair	-	-	-	-	-	-
		Unsched. removal & replace. Scheduled removal						
Miscellaneous SAS equipment	0707	On aircraft repair	1.4520	7.92	1	7.92	.242	-
		Unsched. removal & replace. Scheduled removal						
Second stage mixing	0708	On aircraft repair	1.4520	6.02	1	6.02	-	-
		Unsched. removal & replace. Scheduled removal						
Transfer cables	0709	On aircraft repair	0.2420	2.25	1	2.25	-	-
		Unsched. removal & replace. Scheduled removal						
Trim and stick position	0710	On aircraft repair	0.9680	1.00	1	1.00	.4840	-
		Unsched. removal & replace. Scheduled removal						
Maintenance actions	0711	On aircraft repair	236.1938	0.37	2	0.19	-	-
		Unsched. removal & replace. Scheduled removal						
SAS #1	0712	On aircraft repair	0.2420	0.08	1	0.08	-	-
		Unsched. removal & replace. Scheduled removal						
SAS #1 Maintenance action	0713	On aircraft repair	5.5660	1.16	2	0.58	-	-
		Unsched. removal & replace. Scheduled removal						

TABLE LII. Continued

Subsystem Name	WUC	Task Type	Fail Rate 1000 hr	MWH/ Task	Crew Size	EMT	Mission Affecting Rate	MORS Rate
SAS #2	0714	On aircraft repair Unsched. removal & replace. Scheduled removal	0.2420 - -	6.75 - -	1 - -	6.75 - -	- - -	- - -
SAS #2 Maintenance action	0715	On aircraft repair Unsched. removal & replace. Scheduled removal	4.5980 0.2420 -	0.92 2.00 -	2 2 -	0.46 1.00 -	- - -	- - -

TABLE LIII. CH-47C INPUT DATA - HYDRAULIC SYSTEM									
Subsystem Name	WUC	Task Type	Fail Rate 1000 hr	MMH/ Task	Crew Size	EMT	Mission Affecting Rate	NORS Rate	
Utility	0801	On aircraft repair	3.8721	0.87	1	0.87			
		Unsched. removal & replace.	29.7662	1.04	1.6	0.65	.7260	-	
		Scheduled removal	-	-	-	-	-	-	
Maintenance Actions	0802	On aircraft repair	45.7383	0.51	2	0.25			
		Unsched. removal & replace.	0.2420	1.00	2	0.50	-	-	
		Scheduled removal	-	-	-	-	-	-	

TABLE LIV. CH-47C INPUT DATA - ROTOR SYSTEM

Subsystem Name	WUC	Task Type	Fail Rate 1000 hr	MMH/ Task	Crew Size	EMT	Mission Affecting Rate	NORS Rate
Blades	0901	On aircraft repair Unsched. removal & replace. Scheduled removal	1.6941 1.6941 0.7261	0.80 0.46 0.83	2 1.6 1.6	0.40 0.29 0.52	2.6620	-
Controls	0902	On aircraft repair Unsched. removal & replace. Scheduled removal	1.4520 10.8901 0.2420	0.97 2.35 3.20	1 1.6 1.6	0.97 1.47 2.00	.9680	.2420
Damper	0903	On aircraft repair Unsched. removal & replace. Scheduled removal	2.1780 20.5702 -	0.65 3.36 -	1 1.6 -	0.65 2.10 -	.4840	-
Hub assembly	0904	On aircraft repair Unsched. removal & replace. Scheduled removal	2.4200 10.4061 1.2100	1.54 1.14 4.05	1 1.7 1.7	1.54 0.67 2.38	.4840	.2420
Rainshield and boots	0905	On aircraft repair Unsched. removal & replace. Scheduled removal	2.1780 7.7441 -	0.58 1.87 -	1 1.8 -	0.29 1.04 -	-	-
Maintenance actions	0906	On aircraft repair Unsched. removal & replace. Scheduled removal	116.6448 1.2101 -	1.09 2.06 -	2 2 -	0.55 1.03 -	-	-
Blade, forward 114R1502-25	0907	On aircraft repair Unsched. removal & replace. Scheduled removal	1.6940 8.2280 3.3880	0.73 2.22 2.02	2 1.6 1.6	0.37 1.39 1.26	-	-
Blade, forward Maintenance actions	0908	On aircraft repair Unsched. removal & replace. Scheduled removal	0.4840 0.4840 -	2.67 0.94 -	2 1.6 -	1.34 0.59 -	-	-
Blade, aft 114R1502-26	0909	On aircraft repair Unsched. removal & replace. Scheduled removal	3.3880 3.6300 4.3560	0.50 1.97 2.13	2 1.6 1.6	0.25 1.23 1.33	-	-
Blade, forward 114R1502-25 Maintenance action	0910	On aircraft repair Unsched. removal & replace. Scheduled removal	42.5923 4.1140 -	1.09 1.63 -	2 2 -	0.55 0.82 -	-	-
Blade, forward 114R1502-33 Maintenance action	0911	On aircraft repair Unsched. removal & replace. Scheduled removal	2.4200 0.4840 -	0.68 1.75 -	2 2 -	0.34 0.88 -	-	-
Blade, aft 114R1502-26 Maintenance action	0912	On aircraft repair Unsched. removal & replace. Scheduled removal	27.3463 2.1780 -	1.16 1.09 -	2 2 -	0.58 0.55 -	-	-
Blade, aft 114R1502-34 Maintenance action	0913	On aircraft repair Unsched. removal & replace. Scheduled removal	0.4840 - -	1.34 - -	2 - -	0.67 - -	-	-

TABLE LIV. Continued

Subsystem Name	MUC	Task Type	Fail Rate 1000 hr	MMH/ Task	Crew Size	EMT	Mission Affecting Rate	NORS Rate
Controllable swashplate (aft) 114R3505-12	0914	On aircraft repair Unsched. removal & replace. Scheduled removal	0.4840	4.60	1	4.60	-	-
Controllable swashplate (forward)	0915	On aircraft repair Unsched. removal & replace. Scheduled removal	0.9680	8.34	1	8.34	-	-
Controllable swashplate (aft), maintenance action	0916	On aircraft repair Unsched. removal & replace. Scheduled removal	0.1210	0.08	1	0.08	-	-
Swashplate (aft) 114R3505-12	0917	On aircraft repair Unsched. removal & replace. Scheduled removal	0.1210	0.08	1	0.08	-	-
Rotary wing (assembly) forward	0918	On aircraft repair Unsched. removal & replace. Scheduled removal	0.9680 0.9680	13.51 10.25	2 2	6.75 5.13	-	-
Rotary wing assembly, maintenance action	0919	On aircraft repair Unsched. removal & replace. Scheduled removal	0.1210	0.50	1	0.50	-	-
Rotary wing assembly, maintenance action	0920	On aircraft repair Unsched. removal & replace. Scheduled removal	0.2420	0.50	1	0.50	-	-
Rotary wing assembly, aft	0921	On aircraft repair Unsched. removal & replace. Scheduled removal	0.2420 0.2420	3.83 9.00	2 2	1.92 4.50	-	-
Rotary wing assembly, aft	0922	On aircraft repair Unsched. removal & replace. Scheduled removal	0.2420	2.00	1	2.00	-	-
Rotary wing assembly, aft	0923	On aircraft repair Unsched. removal & replace. Scheduled removal	0.2420	2.00	1	2.00	-	-

TABLE LV. CH-47C INPUT DATA - INDICATING SYSTEM									
Subsystem Name	WUC	Task Type	Fail Rate 1000 hr	MMH/ Task	Crew Size	EMT	Mission Affecting Rate	NORS Rate	
APU indicator	1001	On aircraft repair Unscheduled. removal & replace. Scheduled removal	-	-	-	-	-	-	-
Chip detector	1002	On aircraft repair Unscheduled. removal & replace. Scheduled removal	3.8721 3.3880	0.45 1.55	1	0.45 1.55	-	-	-
Basic flight instruments	1003	On aircraft repair Unscheduled. removal & replace. Scheduled removal	1.4520 4.1140	0.27 0.74	1	0.27 0.74	-	.2420	-
Drive system lubrication	1004	On aircraft repair Unscheduled. removal & replace. Scheduled removal	0.9681 5.8080	0.97 0.88	1	0.97 0.63	-	-	-
Engine fire detection	1005	On aircraft repair Unscheduled. removal & replace. Scheduled removal	1.4522 17.9081	1.09 1.59	1	1.09 1.3	1.22	.2420	-
Hydraulic pressure	1006	On aircraft repair Unscheduled. removal & replace. Scheduled removal	0.2420 0.2420	0.20 0.93	2	0.10 0.58	-	-	-
Master caution indicating	1007	On aircraft repair Unscheduled. removal & replace. Scheduled removal	0.2420 0.9680	1.00 0.80	1	1.00 0.50	-	-	-
Powerplant fuel	1008	On aircraft repair Unscheduled. removal & replace. Scheduled removal	1.2100 2.6620	1.67 0.91	3	0.56 0.30	-	-	-
Powerplant lubrication	1009	On aircraft repair Unscheduled. removal & replace. Scheduled removal	0.9681 6.5340	1.02 1.20	1	1.02 0.92	-	-	-
Powerplant performance	1010	On aircraft repair Unscheduled. removal & replace. Scheduled removal	1.4520 8.9541 0.7260	1.77 1.08 1.62	1	1.77 0.77 1.16	.7260	.2420	-
Rotor tachometer	1011	On aircraft repair Unscheduled. removal & replace. Scheduled removal	1.6940 10.6481	0.83 0.74	1	0.83 0.49	-	-	-
Maintenance actions	1012	On aircraft repair Unscheduled. removal & replace. Scheduled removal	57.8384 0.7260	0.49 0.33	2	0.25 0.16	-	-	-

TABLE XVI. CH-47C INPUT DATA - POWERPLANT SYSTEM									
Subsystem Name	WUC	Task Type	Fail Rate 1000 hr	MMH/ Task	Crew Size	EMF	Mission Affecting Rate	NORS Rate	
Anti-icing and de-icing	1101	On aircraft repair	7.7440	0.61	1	0.61	-	-	
		Unsched. removal & replace. Scheduled removal	9.4381	1.70	1.3	1.31	-	-	
Installation Basic engine	1102	On aircraft repair	2.1780	1.19	1	1.19	-	-	
		Unsched. removal & replace. Scheduled removal	10.8901	1.74	1.5	1.16	9.9221	.4840	
Controls	1103	On aircraft repair	7.3880	0.81	1	0.81	-	-	
		Unsched. removal & replace. Scheduled removal	30.6063	1.17	1.5	0.78	1.2100	.4840	
Cooling and nacelles	1104	On aircraft repair	84.9427	1.02	1	1.02	-	-	
		Unsched. removal & replace. Scheduled removal	54.2084	1.03	1.8	0.57	-	-	
Exhaust	1105	On aircraft repair	8.2281	0.74	1	0.74	-	-	
		Unsched. removal & replace. Scheduled removal	5.5660	1.32	1.4	0.94	-	-	
Fire extinguishing	1106	On aircraft repair	-	-	-	-	-	-	
		Unsched. removal & replace. Scheduled removal	1.4520	0.46	1.3	0.35	-	-	
Fuel	1107	On aircraft repair	10.8901	0.87	1	0.87	-	-	
		Unsched. removal & replace. Scheduled removal	31.2182	2.56	1.3	1.97	2.9040	-	
Ignition	1108	On aircraft repair	0.7260	0.19	1	0.19	-	-	
		Unsched. removal & replace. Scheduled removal	3.8720	0.61	1.9	0.32	.2420	-	
Lubrication	1109	On aircraft repair	2.1780	0.62	1	0.62	-	-	
		Unsched. removal & replace. Scheduled removal	9.9221	1.79	1.3	1.38	2.9040	-	
Mounts and support	1110	On aircraft repair	6.5341	1.29	1	1.29	-	-	
		Unsched. removal & replace. Scheduled removal	28.0722	1.39	1.4	0.99	1.4520	-	
Starting	1111	On aircraft repair	0.4840	0.67	1	0.67	-	-	
		Unsched. removal & replace. Scheduled removal	2.9040	0.98	1.4	0.70	.4840	-	
Maintenance action	1112	On aircraft repair	293.3062	1.22	2	0.61	-	-	
		Unsched. removal & replace. Scheduled removal	20.5702	1.63	2	0.82	-	-	
LH engine	1113	On aircraft repair	1.2100	3.90	1	3.90	-	-	
		Unsched. removal & replace. Scheduled removal	4.8400	13.68	1.5	9.12	-	-	

TABLE LVI. Continued									
Subsystem Name	WDC	Task Type	Fail Rate 1000 hr	MMH/ Task	Crew Size	EMT	Mission Affecting Rate	NORS Rate	
LH engine maintenance action	1114	On aircraft repair Unsched. removal & replace. Scheduled removal	10.1641 0.9680 -	0.98 1.98 -	2 2 -	0.49 1.99 -	- - -	- - -	
RH engine	1115	On aircraft repair Unsched. removal & replace. Scheduled removal	0.2420 6.2920 -	1.75 13.14 -	1 1.5 -	3.75 8.89 -	- - -	- - -	
RH engine maintenance action	1116	On aircraft repair Unsched. removal & replace. Scheduled removal	12.0681 0.2420 -	0.97 14.92 -	2 2 -	0.49 7.46 -	- - -	- - -	
RH engine maintenance actions	1117	On aircraft repair Unsched. removal & replace. Scheduled removal	1.0000 - -	0.97 - -	2 - -	0.49 - -	- - -	- - -	

APPENDIX V
HLH R&M INPUT DATA BASE

Tables LVII through LV have been employed in the development of the HLH R&M simulation model functions tables.

Included in this appendix are the various inspection and servicing tasks against the rotor, flight controls, drive, and cargo handling systems. These items are not malfunctions. As such the total malfunction rate used for the HLH simulation is approximately 1.05 occurrences per flight hour.

TABLE LVII. HLH INPUT DATA - NON-ATC SYSTEM						
Subsystem Name	WUC	Task Type	Failure Rate/1000 hr	MMH/Task	Crew Size	Mission Affecting Rate/1000 hrs
Fuselage	90*	0101 On aircraft repair Unscheduled, removal & replace. Scheduled removal	314.0	1.0	2	0.5
	10*	0102 On aircraft repair Unscheduled, removal & replace. Scheduled removal	35.0	39.0	5	7.8
Nacelles	90*	0201 On aircraft repair Unscheduled, removal & replace. Scheduled removal	23.4	1.0	2	0.5
	10*	0202 On aircraft repair Unscheduled, removal & replace. Scheduled removal	2.6	20.0	5	4.0
Landing gear	90*	0301 On aircraft repair Unscheduled, removal & replace. Scheduled removal	61.2	1.0	2	0.5
	10*	0302 On aircraft repair Unscheduled, removal & replace. Scheduled removal	6.8	26.0	5	5.2
Powerplant	90	0401 On aircraft repair Unscheduled, removal & replace. Scheduled removal	40.5	1.0	2	0.5
	10*	0402 On aircraft repair Unscheduled, removal & replace. Scheduled removal	4.5	58.0	5	11.6
Powerplant controls	90*	0501 On aircraft repair Unscheduled, removal & replace. Scheduled removal	53.1	1.0	2	0.5
	10*	0502 On aircraft repair Unscheduled, removal & replace. Scheduled removal	5.9	18.0	4	4.5
Fuel	90*	0601 On aircraft repair Unscheduled, removal & replace. Scheduled removal	19.8	1.0	2	0.5
	10*	0602 On aircraft repair Unscheduled, removal & replace. Scheduled removal	2.2	48.0	6	8.0

TABLE LVII. Continued							
Subsystem Name	WUC	Task Type	Failure Rate/1000 hr	MWH/Task	Crew Size	EMT	Mission Affecting Rate/1000 hrs
APU	900	0701 On aircraft repair Unsched. removal & replace. Scheduled removal	4.5	1.0	2	0.5	0.636
	100	0702 On aircraft repair Unsched. removal & replace. Scheduled removal	0.5	45.0	5	9.0	-
Communications	900	0801 On aircraft repair Unsched. removal & replace. Scheduled removal	14.4	1.0	2	0.5	0.002
	100	0802 On aircraft repair Unsched. removal & replace. Scheduled removal	1.6	10.8	3	3.6	-
Navigational/ guidance	900	0901 On aircraft repair Unsched. removal & replace. Scheduled removal	36.9	0.4	1	0.4	0.000
	100	0902 On aircraft repair Unsched. removal & replace. Scheduled removal	4.1	0.4	1	0.4	-
Instruments	900	1001 On aircraft repair Unsched. removal & replace. Scheduled removal	65.7	1.0	2	0.5	0.184
	100	1002 On aircraft repair Unsched. removal & replace. Scheduled removal	7.3	15.0	3	5.0	-
Auxiliary Elect	900	1101 On aircraft repair Unsched. removal & replace. Scheduled removal	5.4	0.3	1	0.3	0.000
	100	1102 On aircraft repair Unsched. removal & replace. Scheduled removal	0.6	0.3	1	0.3	--
AIDAPS	900	1201 On aircraft repair Unsched. removal & replace. Scheduled removal	1.8	1.0	2	0.5	0.000
	100	1202 On aircraft repair Unsched. removal & replace. Scheduled removal	0.2	26.0	5	5.2	-

TABLE LVII. Continued

Subsystem Name	MUC	Task Type	Failure Rate/ 1000 hr	MMH/ Task	Crew Size	EMT	Mission Affecting Rate/ 1000 hrs
Pneumatic power	1301	On aircraft repair Unsched. removal & replace. Scheduled removal	22.5	1.0	2	0.5	0.001
	1302	On aircraft repair Unsched. removal & replace. Scheduled removal	2.5	20.0	5	4.0	-
Hydraulic power (utility)	1401	On aircraft repair Unsched. removal & replace. Scheduled removal	31.5	1.0	2	0.5	0.573
	1402	On aircraft repair Unsched. removal & replace. Scheduled removal	3.5	16.4	4	4.1	-
Electrical power	1501	On aircraft repair Unsched. removal & replace. Scheduled removal	32.4	1.0	2	0.5	0.144
	1502	On aircraft repair Unsched. removal & replace. Scheduled removal	3.6	16.0	4	4.0	-
Accommodations/ furnishings	1601	On aircraft repair Unsched. removal & replace. Scheduled removal	17.1	1.0	2	0.5	0.000
	1602	On aircraft repair Unsched. removal & replace. Scheduled removal	1.9	33.0	5	6.6	-
Environmental/ control	1701	On aircraft repair Unsched. removal & replace. Scheduled removal	12.6	1.0	2	0.5	0.020
	1702	On aircraft repair Unsched. removal & replace. Scheduled removal	1.4	51.0	6	8.5	-
Flight controls	1801	On aircraft repair Unsched. removal & replace. Scheduled removal	67.4	1.0	2	0.5	0.190
	1802	On aircraft repair Unsched. removal & replace. Scheduled removal	7.5	37.0	5	7.4	-

TABLE LVIII. HLR INPUT DATA - ROTOR SYSTEM						
Subsystem Name	MUC	Task Type	Failure Rate/1000 hr	MMH/Task	Crew Size	Mission Affecting Rate/1000 hrs
Hub and upper controls (fault isolation)	1901	On aircraft repair	5.333	0.5000	1	0.5
Forward rotor blades (inspection)	1902	On aircraft repair	100.0	0.0904	2	0.5148
Forward rotor blades (inspection)	1903	On aircraft repair	3.3	2.6754	2	2.2737
Rotor blade (troubleshoot failure detection system)	1904	Unsched. removal & replace.	0.2742	1.4040	1	1.4040
Forward rotor blades (removal and replacement)	1905	Unsched. removal & replace.	1.3946	5.7720	5	2.1645
Forward rotor blades (track)	1906	On aircraft repair	3.1982	1.5015	3	1.4235
Forward and aft rotor blades (check track)	1907	On aircraft repair	31.4754	0.2730	2	0.3705
Forward rotor blades (removal and replacement tiedown fitting)	1908	Unsched. removal & replace.	0.0053	0.8970	3	0.7995
Aft rotor blades (inspection)	1909	On aircraft repair	100.0	3.3384	3	1.2948
Aft rotor blades (inspection)	1910	On aircraft repair	3.3	5.2260	2	2.6910
Aft rotor blades (track)	1911	On aircraft repair	3.1982	1.7745	3	1.6965
Aft rotor blades (removal and replacement tiedown fittings)	1912	Unsched. removal & replace.	0.0053	1.7940	3	1.4235

TABLE LVIII. Continued

Subsystem Name	WUC	Task Type	Failure Rate/1000 hr	MMH/Task	Crew Size	EMT	Mission Affecting Rate/1000 hrs
Aft rotor blade (removal & replacement)	1913	Unscheduled, removal & replace.	1.3946	6.4545	5	2.4570	0.3265
Hub assembly (inspection)	1914	On aircraft repair	3.333	0.8970	1	0.8970	-
Hub assembly (removal & replacement)	1915	Unscheduled, removal & replace.	0.4477	20.0655	5	11.0292	0.3713
Hub assembly (rem & repl pitch housing/cross beam assembly)	1916	Unscheduled, removal & replace.	10.731	6.5130	4	2.6715	-
Hub assembly (replace bearing elastomeric)	1917	Unscheduled, removal & replace.	5.319	1.7355	3	0.9165	-
Hub assembly (rem & repl centrifugal stop assembly)	1918	Unscheduled, removal & replace.	0.0387	0.9360	3	0.5655	-
Hub assembly (replacement shear bearing)	1919	Unscheduled, removal & replace.	2.236	1.4040	3	0.8190	-
Hub assembly (rem & repl pitch housing assembly)	1920	Unscheduled, removal & replace.	0.4183	0.9360	3	0.5655	-
Hub assembly (replace cross beam)	1921	Unscheduled, removal & replace.	0.0362	1.8720	3	1.0530	-
Hub assembly (service damper assembly)	1922	On aircraft repair	3.2	0.8970	2	0.4875	-
Hub assembly (inspection of damper assembly)	1923	On aircraft repair	3.333	0.0780	1	0.0780	-
Hub assembly (rem & repl. damper assembly)	1924	Unscheduled, removal & replace.	7.0	2.1645	3	1.0725	0.1168
Hub assembly (repair, repl. bearing)	1925	On aircraft repair	0.9018	0.9945	3	0.6240	-

TABLE LVIII. Continued						
Subsystem Name	WUC	Task Type	Failure Rate/1000 hr	MMH/Task	Crew Size	Mission Affecting Rate/
Hub assembly (repl. outboard bearing)	1926	Unsched. removal & replace.	.9018	2.0670	4	1.1310
Hub & upper controls (inspection)	1927	On aircraft repair	100.0	0.8424	1	0.8424
Upper controls (inspection)	1928	On aircraft repair	3.333	0.6942	2	0.6942
Upper controls (removal & repl. pitch link)	1929	Unsched. removal & replace.	3.6072	1.2480	3	0.7995
Upper controls pitch link (replace bearings)	1930	Unsched. removal & replace.	7.2144	0.2457	2	0.2457
Upper controls (grease swash-plate bearings)	1931	Unsched. removal & replace.	3.333	1.9110	2	1.1505
Upper controls (removal & repl. swashplate assembly)	1932	Unsched. removal & replace.	1.6328	24.5115	5	12.0042
Upper controls (repl. bearing condition sensor)	1933	Unsched. removal & replace.		0.4290	1	0.4290
Upper controls (removal & replace. scissors arm)	1934	Unsched. removal & replace.	0.0750	6.5325	3	3.9195

TABLE LIX. HLM INPUT DATA - CARGO HANDLING SYSTEM

Subsystem Name	WUC	Task Type	Failure Rate/1000 hr	MMH/Task	Crew Size	Lat	Mission Affecting Rate/1000 hrs
Cargo handling (inspect)	2001	On aircraft repair	100.0	0.4797	1	0.4797	-
Cargo handling (inspect)	2002	On aircraft repair	3.3	0.9906	1	0.9906	-
Hoist drive assembly (service-oil)	2003	On aircraft repair	5.584	0.2535	1	0.2535	-
Hoist drive assembly (removal and replacement)	2004	Unsched. removal & replace.	1.9570	1.1895	2	0.9555	0.1370
Brake assembly (removal and replacement)	2005	Unsched. removal & replace.	0.1390	1.8330	2	1.5210	-
Control valve unit (R&R modified valve)	2006	Unsched. removal & replace.	0.7500	0.5460	1	0.5460	-
Control valve unit (R&R shutoff valve)	2007	Unsched. removal & replace.	0.4000	0.5460	1	0.5460	-
Tach generator (removal and replacement)	2008	Unsched. removal & replace.	0.1650	0.7800	1	0.7800	-
Winch assembly (clean)	2009	On aircraft repair	20.0	0.4875	1	0.4875	-
Winch assembly (removal and replacement)	2010	Unsched. removal & replace.	0.670	2.1840	2	1.170	-
Winch assembly (tear down/build up quick change package)	2011	On aircraft repair	0.798	4.6800	3	2.5155	-
Winch assembly (service bevel gearboxes)	2012	On aircraft repair	4.8	0.5070	1	0.5070	-
Winch assembly (service-grease ball spline)	2013	On aircraft repair	1.1	0.7605	1	0.7605	-

TABLE LIX. Continued

Subsystem Name	WUC	Task Type	Failure Rate/1000 hr	MMH/Task	Crew Size	EHT	Mission Affecting Rate/1000 hrs
Winch assembly (remove, inspect chip detector)	2014	On aircraft repair	1.280	0.4680	1	0.4680	-
Winch assembly (R&R drum traversing wheels)	2015	Unsched. removal & replace.	0.1000	1.0530	1	1.0530	-
Winch assembly (repl bevel gear-box oil seals)	2016	Unsched. removal & replace.	0.4400	5.8695	3	3.1395	-
Winch assembly (repl side load beam wear strips)	2017	Unsched. removal & replace.	0.450	2.3010	2	1.8330	-
Cable cutter assembly (rem & repl cable cutter)	2018	Unsched. removal & replace.	0.278	1.9110	3	1.0140	-
Cable cutter assembly (sched repl of cartridge/ignitors)	2019	Scheduled removal	0.278	0.7488	2	0.5070	-
Tension member (rem & repl tension members)	2020	Unsched. removal & replace.	0.00	1.9500	2	1.1700	0.023
Signal reel assembly (rem & repl signal reel assembly)	2021	Unsched. removal & replace.	0.3613	1.0725	2	0.6435	0.010
Signal reel assembly (replace signal conductor)	2022	Unsched. removal & replace.	0.150	1.2090	1	1.2090	-
Signal reel assembly (repl ribbon tape cartridge)	2023	Unsched. removal & replace.	0.050	1.0725	1	1.0725	-
Signal reel assembly (rem & repl pneumatic valve)	2024	Unsched. removal & replace.	0.3360	0.5070	1	0.5070	-
Coupling assembly (clean)	2025	On aircraft repair	50.0	0.4680	1	0.4680	-
Coupling assembly (rem & repl coupling assembly)	2026	Unsched. removal & replace.	0.9100	0.3510	2	0.2925	0.024

TABLE L-2. Continued						
Subsystem Name	MUC	Task Type	Failure Rate/1000 hr	MHI Task	Crew Size	Mission Affecting Rate/1000 hr
Coupling assembly (rem & repl solenoid assembly)	2027	Unsched. removal & replace.	0.128	1.4004	1	1.4040
Coupling assembly (repl & adjust switch(es))	2028	Unsched. removal & replace.	0.528	1.3065	1	1.3065
Control panel (removal and replacement)	2029	Unsched. removal & replace.	0.50	0.2535	1	0.2535
Control panel (repair - replace switch)	2030	Unsched. removal & replace.	0.50	0.2340	1	0.2340
Indicators (rem & repl an indicator)	2031	Unsched. removal & replace.	2.5	0.2535	1	0.2535
Hoist control grip (replace faulty switch)	2032	Unsched. removal & replace.	1.0	0.4290	1	0.4290
Support & span positioning (rem & repl cable/pulley)	2033	Unsched. removal & replace.	0.008	0.6825	1	0.6825
Support & span positioning (rem & repl articulated pneu duct)	2034	Unsched. removal & replace.	0.825	0.7605	1	0.7605
Support & span positioning sys (repair, repl hinged track section)	2035	On aircraft repair	0.005	1.3065	2	0.8385
Actuator/gearbox (removal and replacement)	2036	Unsched. removal & replace.	0.058	0.7410	1	0.7410
Position lock actuator (removal & replacement)	2037	Unsched. removal & replace.	0.0172	0.7410	2	0.7020
Load isolator (recharge nitrogen chamber)	2038	On aircraft repair	7.2	0.4485	1	0.4485
Load isolator (removal and replacement)	2039	Unsched. removal & replace.	2.000	1.1700	3	0.8190

TABLE LIX. Continued						
Subsystem Name	WUC	Task Type	Failure Rate/1000 hr	MMH/Task	Crew Size	Mission Affecting Rate/1000 hr
Visual augmentation system (inspect)	2040	On aircraft repair	100.0	0.0195	1	0.0195
Camera & lens assembly (clean lens cover)	2041	On aircraft repair	80.0	0.1560	1	0.1560
Camera & lens assembly (repl VAS camera unit)	2042	Unsched. removal & replace.	0.001	1.0335	3	0.8970
Camera lens assembly (repl lens assembly)	2043	Unsched. removal & replace.	0.001	2.0475	3	1.6575
VAS display unit (removal and replacement)	2044	Unsched. removal & replace.	0.001	0.3510	1	0.3510

TABLE LX. HLH INPUT DATA - DRIVE SYSTEM						
Subsystem Name	WUC	Task Type	Failure Rate/1000 hr	MMH/Task	Crew Size	Mission Affecting Rate/1000 hr
Aft transmission (clean main indicating screen)	2101	On aircraft repair	0.122	0.5070	1	0.5070
Aft transmission (clean secondary indicating screen)	2102	On aircraft repair	0.128	0.5070	1	0.5070
Chip detector (examine and clean)	2103	On aircraft repair	0.66	0.5265	1	0.5265
Aft transmission (inspection)	2104	On aircraft repair	100.0	0.1170	1	0.1170
Aft transmission (inspection)	2105	On aircraft repair	3.3	0.1950	1	0.1950
Aft transmission (remove, build-up, replace)	2106	Unscheduled. removal & replace.	0.472	38.9961	5	29.4762
Aft transmission (rem & repl temp probe)	2107	Unscheduled. removal & replace.	0.378	0.1560	2	0.1170
Press transducer (probe) primary (rem & repl)	2108	Unscheduled. removal & replace.	0.357	0.4485	1	0.4485
Oil cooler (removal and replacement)	2109	Unscheduled. removal & replace.	0.632	5.0115	3	3.3735
Blower (oil cooler) (rem & repl)	2110	Unscheduled. removal & replace.	0.196	2.3790	3	1.5600
Aux lube pump (removal and replacement)	2111	Unscheduled. removal & replace.	0.011	0.5265	1	0.5265
Main lube pump (removal and replacement)	2112	Unscheduled. removal & replace.	0.035	0.8385	1	0.8385
Main lube pump (rem & repl pump filter)	2113	Unscheduled. removal & replace.	0.164	0.6435	1	0.6435

TABLE LX. Continued						
Subsystem Name	WUC	Task Type	Failure Rate/1000 hr	MHR/Task	Crew Size	Mission Affecting Rate/1000 hr
Aft xman accessory assembly (replace accessory seals)	2114	Unashed. removal & replace.	2.877	2.6520	2	2.1450
Combining xman (clean indicating screen (primary))	2115	On aircraft repair	0.66	0.5070	1	0.5070
Combining xman (clean indicating screen secondary)	2116	On aircraft repair	0.66	0.5070	1	0.5070
Combining xman (inspection)	2117	On aircraft repair	100.0	0.1170	1	0.1170
Combining xman (inspection)	2118	On aircraft repair	3.3	0.6630	1	0.6630
Combining xman (rem build-up and replace out the top)	2119	Unashed. removal & replace.	0.342	20.0460	4	9.7110 0.385
Combining xman (rem build-up and replace out the back)	2120	Unashed. removal & replace.	0.342	28.3140	3	15.1320
Combining xman (rem build-up and replace thru floor)	2121	Unashed. removal & replace.	0.342	16.3800	3	9.2430
Combining xman (rem & repl temp probe)	2122	Unashed. removal & replace.	0.378	0.1560	2	0.1170
Combining xman (rem & repl press reducer-primary)	2123	Unashed. removal & replace.	0.357	0.2925	1	0.2925
Combining xman oil cooler (rem & repl)	2124	Unashed. removal & replace.	0.632	4.4655	3	2.6325
Combining xman (rem & repl fan-(oil cooled))	2125	Unashed. removal & replace.	0.196	1.5990	3	1.4040
Combining xman (rem & repl clutch assembly)	2126	Unashed. removal & replace.	0.200	3.5880	3	2.1283

TABLE LX. Continued						
Subsystem Name	WUC	Task Type	Failure Rate/1000 hr	MMH/Task	Crew Size	Mission Affecting Rate/1000 hr
Combining xman (rem & repl filter element (primary))	2127	Unsched. removal & replace.	0.115	0.5655	2	0.5265
Combining xman (rem & repl oil pump (primary))	2128	Unsched. removal & replace.	0.047	3.1005	3	1.7355
Combining xman (rem & repl rotor brake)	2129	Unsched. removal & replace.	1.6760	2.6910	3	1.7940
Combining xman (rem & repl rotor brake disc)	2130	Unsched. removal & replace.	0.068	4.3485	3	2.5333
#1 & #2 shafting & couplings - R/H Engine (inspection)	2131	On aircraft repair	100.0	0.1053	1	0.1053
Engine shafting (inspection)	2132	On aircraft repair	100.0	0.2613	1	0.2613
#3 shaft to LH engine (inspection)	2133	On aircraft repair	100.0	0.1560	1	0.1560
#2 engine shaft assembly replace	2134	Unsched. removal & replace.	0.512	2.5896	2	1.4040
Engine shafting (inspection)	2135	On aircraft repair	3.3	0.4134	1	0.4134
#1 & #2 shafting & coupling - R/H Engine (inspection)	2136	On aircraft repair	3.3	0.2262	1	0.2262
#1 & #2 shafting & coupling - L/H Engine (inspection)	2137	On aircraft repair	3.3	0.2262	1	0.2262
#3 shaft to R/H Engine (inspection)	2138	On aircraft repair	3.3	0.1872	1	0.1872
#3 shaft to L/H Engine (inspection)	2139	On aircraft repair	3.3	0.1872	1	0.1872

TABLE LX. Continued						
Subsystem Name	WUC	Task Type	Failure Rate/ 1000 hr	MMH Task	Crew Size	Mission Affecting Rate/ 1000 hr
Sync shaft bearings forward xmsn to comb (lube)	2140	On aircraft repair	3.3	0.2262	1	0.2262
Sync shaft bearings comb to aft rotor (lube)	2141	On aircraft repair	3.3	0.0468	1	0.0468
Engine shafting bearings, left, right, center engines (lube)	2142	On aircraft repair	3.3	0.1404	1	0.1404
Sync shafting forward xmsn to comb xmsn (inspection)	2143	On aircraft repair	100.0	0.3822	1	0.3822
Sync shafting comb xmsn to aft rotor xmsn (inspec)	2144	On aircraft repair	100.0	0.1248	1	0.1248
Sync shafting forward xmsn to comb xmsn (inspection)	2145	On aircraft repair	3.3	0.7800	1	0.7800
Sync shafting comb xmsn to aft rotor xmsn (inspec)	1246	On aircraft repair	3.3	0.2886	1	0.2886
Slant shaft No. 11 (rem & repl)	2147	Unsched. removal & replace.	0.1951	3.8415	3	2.0865
Slant shaft No. 10 (rem & repl)	2148	Unsched. removal & replace.	0.1951	5.3430	3	2.8275
Sync shaft bearings (removal and replacement)	2149	Unsched. removal & replace.	0.782	2.1283	2	1.9305
Sync shaft mount (removal and replacement)	2150	Unsched. removal & replace.	2.660	0.7020	2	0.5070
Drive shafting (burnish out nicks, gouges, scratches)	2151	On aircraft repair	4.053	0.7800	2	0.8580
Forward xmsn (clean main indicating screen)	2152	On aircraft repair	0.128	0.5070	1	0.5070

TABLE LX. Continued						
Subsystem Name	WUC	Task Type	Failure Rate/1000 hr	MMH Task	Crew Size	Mission Affecting Rate/1000 hr
Forward xmsn (clean secondary indicating screen)	2153	On aircraft repair	0.128	0.5070	1	0.5070 -
Chip detector (examine and clean)	2154	On aircraft repair	0.66	0.5265	1	0.5265 -
Forward xmsn (inspection)	2155	On aircraft repair	100.0	0.1170	1	0.1170 -
Forward xmsn (inspection)	2156	On aircraft repair	3.3	0.1950	1	0.1950 -
Forward xmsn (rem build-up, replace)	2157	Unsched. removal & replace.	0.472	38.9961	5	29.4762 0.395
Forward xmsn (rem & repl temp probe)	2158	Unsched. removal & replace.	0.378	0.1560	2	0.1170 -
Press transducer (probe) primary (rem & repl)	2159	Unsched. removal & replace.	0.357	0.4485	1	0.4485 -
Oil cooler (rem & repl)	2160	Unsched. removal & replace.	0.632	5.0115	3	3.3735 -
Blower (oil cooler) (rem & repl)	2161	Unsched. removal & replace.	0.196	2.3790	3	4.5600 -
Auxiliary lube pump (rem & repl)	2162	Unsched. removal & replace.	0.011	0.5265	1	0.5265 -
Main lube pump (rem & repl)	2163	Unsched. removal & replace.	0.035	0.8385	1	0.8385 -
Main lube pump (rem & repl pump filter)	2164	Unsched. removal & replace.	0.164	0.6435	1	0.6435 -
Forward xmsn accessory assy (repl accessory seals)	2165	Unsched. removal & replace.	2.877	2.6520	2	2.1450 -

APPENDIX VI
DOCUMENTATION OF MODIFICATIONS TO
GOVERNMENT-FURNISHED SIMULATION MODEL

The following changes have been made to the Government-furnished simulation model:

1 In modifying the model to accommodate a platoon size of up to 24 aircraft, several reallocations of resources were made. The reallocation of Blocks (BLO) and Fullword Save Values (FSV) should not constrain any future runs or minor model changes.

If it is desired to keep the model core requirements at a minimum, a reallocation of Transactions (XAC) to 400 and Common (COM) to 175,000 will support up to 11 aircraft in most maintenance concepts and mission profiles.

If execution error 599 (limits of core exceeded) is encountered, increase the total core request for the job step by 50,000 bytes.

If execution error 468 or 469 (number of transactions exceeded) is encountered, increase the reallocation of transactions (XAC) by 100, Common (COM) by 50,000, and the total core request for the job step by 50,000 bytes.

2 It is advised that for early applications of the model (debugging) a delimiter be used in column 19 of the simulate card. A value of 6 was used in most analyses, which limited the simulation to 6 CPU minutes.

3 The UNLIST card was added to the original model to suppress model listing.

4 Variable 9 has been generalized with respect to run duration.

5 Variable 10 generalizes the calendar PMP inspection to be a function of input X195 (the calendar inspection interval) rather than a constant in the variable definition.

6 Variable 11 is a modified variable used in the the tests for calendar PMP. It is generalized to be a function of input X195. Parameter 47 (P47) contains the initial time since last calendar PMP for the aircraft. Subsequent to induction of an aircraft into the PMP routine, the P47 value is reset to zero.

①	424923 JANE ZP3E9300	
	REALLOCATE 8L3,1350	07000100
	REALLOCATE 9T3,90	07000200
	REALLOCATE 2J2,70	07000300
	REALLOCATE L73,80	07000400
	REALLOCATE P14,60	07000500
	REALLOCATE T49,20	07000600
	REALLOCATE 9V4,20	07000700
	REALLOCATE V49,250	07000800
	REALLOCATE P9V,1600	07000900
	REALLOCATE 49V,90	07001000
	REALLOCATE C44,60	07001100
	REALLOCATE 333,70	07001200
	REALLOCATE P49,5	07001300
①	REALLOCATE 449,10	07001400
②	REALLOCATE X40,600	07001500
③	REALLOCATE C74,250000	07001600
	ST4J,ATP	07001700
	JN,IST	07001800
1	VAR1ABLE 22+45 MISSION MATRIX COLUMN NUMBERS	07001900
2	VAR1ABLE 211+45 MISSION MATRIX NUMBERS	07002000
3	VAR1ABLE 211+45 "MISSION FLYING 4722 33AL" SWITCH NUMBERS	07002100
4	VAR1ABLE 211+41 "MISSION FLYING 4722 33AL" SAVEVALUE NUMBERS	07002200
5	VAR1ABLE 24+45 "AIRCRAFT NOT AVAILABLE WHEN CALLED" MISSION X	07002300
6	VAR1ABLE 24+45 "MISSION LAUNCH GATE" SWITCH NUMBERS	07002400
7	VAR1ABLE 211+413 "MISSION CYCLIC FLYING 4722 33AL" SWITCH NUMBERS	07002500
④	VAR1ABLE 24+413 "MISSION CYCLIC FLYING 4722 33AL" SWITCH NUMBERS	07002600
	4X(5,1)-42	07002700
⑤	CHANGES TO TONORRATE CALENDAR INSPECTION/INTERVALS	07002710
⑥	VAR1ABLE (241+1000+241)X195 TOTAL DAYS SINCE PMP	07002800
	(237+(51/240))X195 DAYS SINCE PMP	07002900
	241+1000+241 SIX DIGIT 24V24V NUMBER	07003000
	VAR1ABLE 24+45 MISSION STORE 6 LAUNCH GATE SWITCH NUMBERS	07003100
	VAR1ABLE 24+413 "MISSION CYCLIC FLYING 4722 33AL" SWITCH NUMBERS	07003200
	VAR1ABLE 24+415 24V24V 24V24V 24V24V 24V24V 24V24V 24V24V	07003300
	VAR1ABLE 24+426 SAVEVALUE NUMBERS - FLIGHT 4722 33AL BY MISSION	07003400
	VAR1ABLE P49/2 4722 33AL TIME REMAINING 4722 33AL	07003500
	VAR1ABLE (320-V22)X24 TIME REMAINING 4722 33AL NEXT DAY	07003600
	VAR1ABLE C10210 TIME 4722 33AL 4722 33AL	07003700
	VAR1ABLE 0100+X1(1,10) 00TIME 4722 33AL ALTERNATE DAILY	07003800
	VAR1ABLE P45/10000 4722 33AL REQUIRED	07003900
	VAR1ABLE P45/1000100 4722 33AL CENTER	07004000
	VAR1ABLE P460100 4722 33AL ELAPSED TIME TO PERFORM EVENT	07004100
	VAR1ABLE 217+4 4722 33AL STORE NUMBERS	07004200
	VAR1ABLE 22+33 4722 33AL CENTER QUEUE 1 1ST SHIFT STORE NUMBERS	07004300
	VAR1ABLE 22+45 2ND SHIFT 4722 33AL CENTER 4722 33AL	07004400
	VAR1ABLE 22+220 4722 33AL X 100	07004500
	VAR1ABLE 22+4 4722 33AL 4722 33AL 4722 33AL 4722 33AL	07004600
	VAR1ABLE 22+45+24+11 4722 33AL 4722 33AL 4722 33AL	07004700
	VAR1ABLE 3+3V14 4722 33AL 4722 33AL 4722 33AL 4722 33AL	07004800
	VAR1ABLE 42+4V14+8 4722 33AL 4722 33AL 4722 33AL 4722 33AL	07004900
	VAR1ABLE 43+3V14+8 4722 33AL 4722 33AL 4722 33AL 4722 33AL	07005000
	VAR1ABLE 220+C10240 TIME REMAINING 4722 33AL SECOND SHIFT	07005100
	VAR1ABLE 23+46 4722 33AL X 100	07005200
	VAR1ABLE 22+24 4722 33AL 4722 33AL 4722 33AL 4722 33AL	07005300

39	VARIABLE	140-21-240 TIME REMAINING - FIRST SHIFT	00005400
39	VARIABLE	P4-P20 ENT IN EXCESS OF CURRENT SHIFT LENGTH	00005500
40	VARIABLE	P2+20 SAVEVALUE NUMBERS, NUMBER OF P2 HOURS/SHIFT	00005600
41	VARIABLE	P19+30 SAVEVALUE NUMBERS, NUMBER OF HOURS/P19 EVENT	00005700
42	VARIABLE	P3+100+P5 ELEMENT NUMBER	00005800
43	VARIABLE	P437/1000 PROBABILITY OF R & R	00005900
44	VARIABLE	P22/100 ELEMENT SYSTEM NUMBER	00006000
47	VARIABLE	P1+25 PARAMETER IDENTIFICATION - WORK CENTER	00006100
49	VARIABLE	P440/10000 99/99 WORK CENTER	00006200
50	VARIABLE	P440+10000/100 ORGANIZATIONAL SECONDARY WORK CENTER	00006300
51	VARIABLE	P440+100 ORGANIZATIONAL PRIMARY WORK CENTER	00006400
51	VARIABLE	P1+25 PARAMETER IDENTIFICATION - M.P.	00006500
52	VARIABLE	P442/10000 99/99 MANPOWER (M.P.)	00006600
53	VARIABLE	P442+10000/100 ORGANIZATIONAL SECONDARY M.P.	00006700
54	VARIABLE	P442+100 ORGANIZATIONAL PRIMARY M.P.	00006800
55	VARIABLE	10+(P443+1000+P436+500)/1000 NEXT - R & R	00006900
56	VARIABLE	P4+10 UNITS CONVERSION	00007000
57	VARIABLE	(4X1(4,5)+P436+500)/1000 MEAN GSE DELAY TIME	00007100
59	VARIABLE	P2+37 SAVEVALUE NUMBERS-JUSTIFIED MM BY WORK CENTER	00007200
59	VARIABLE	1+3V4 MATRIX COLUMN IDENTIFICATION	00007300
60	VARIABLE	41+410 UNITS CONVERSION	00007400
61	VARIABLE	P445 DELAY TIME TO OBTAIN PART	00007500
62	VARIABLE	484393-484394 WORK TEST VALUE	00007600
63	VARIABLE	P2+489 SAVEVALUE NUMBERS-EQUALIZATION MM BY WORK	00007700
64	VARIABLE	P1+21 TIME WHEN PART BECOMES AVAILABLE	00007800
65	VARIABLE	(P443/1000+P436+500)/1000 GPP-EQUIPMENT RPR NEXT	00007900
66	VARIABLE	P443/1000 GPP-EQUIPMENT REPAIR TIME	00008000
67	VARIABLE	P29+456 STOCKS INDEX FOR 99 WORK CENTERS	00008100
69	VARIABLE	P29+445 QUEUE INDEX FOR 99 WORK CENTERS	00008200
69	VARIABLE	P29+463 SAVEVALUE NUMBERS FOR WORK CENTER TOTAL MM'S	00008300
70	VARIABLE	P31+94 MAN HOURS X 100	00008400
71	VARIABLE	P437+1000 PERCENT ELEMENTS REPAIRED @ GS	00008500
72	VARIABLE	P447/1000 PERCENT ELEMENTS WRTS (1-8) @ GS	00008600
73	VARIABLE	P440+100 PERCENT ELEMENTS WRTS (9) @ GS	00008700
73	VARIABLE	P3+4X3(42,4)-21 DELAY TIME IN MPC/SHIFT ROUTINE	00008800
74	VARIABLE	P4+2+1 NUMBER OF MEN STILL REQUIRED	00008900
77	VARIABLE	P4+44 SECOND SHIFT WORK CENTER CHAIN/STORE INDEX	00009000
79	VARIABLE	P4+33 FIRST SHIFT WORK CENTER CHAIN/STORE INDEX	00009100
79	VARIABLE	P3+99 TIME INTERVAL	00009200
90	VARIABLE	P2+48+4(K3-P18) MANPOWER REDUCTION MATRIX INDEX	00009300
91	VARIABLE	121+94+K11(K3-P18) MANPOWER CONTROL CHAIN/STORE INDEX	00009400
92	VARIABLE	P9-21003 MANPOWER REDUCTION CONTROL TIME	00009500
93	VARIABLE	P6-4+7 MANPOWER DIFFERENCE	00009600
94	VARIABLE	4X1(5,2)+4X1(5,3)+4X1(5,4) MAN HOUR SUMMATION	00009700
135	VARIABLE	P431/1000 ELEMENT PROBABILITY OF ROR	00009800
136	VARIABLE	P454+100 MANPOWER - IN EQUIPMENT REPAIR	00009900
137	VARIABLE	P454/100 MANPOWER - IN EQUIPMENT REPAIR	00010000
139	VARIABLE	(P453/1000+P436+500)/1000 EMET-ON EQUIPMENT REPAIR	00010100
139	VARIABLE	P452/1000 PROBABILITY OF REPAIR BY 99	00010200
140	VARIABLE	P452+1000 PROBABILITY OF REPAIR BY 99	00010300
141	VARIABLE	P29+477 STOCKS INDEX FOR 99 WORK CENTERS	00010400
142	VARIABLE	P29+456 QUEUE INDEX FOR 99 WORK CENTERS	00010500
143	VARIABLE	P28+95 SAVEVALUE NUMBERS FOR WORK CENTERS TOTAL MM'S	00010600
144	VARIABLE	C41+43ARM14 AIRCRAFT AVAILABLE NEXT AM	00010700
145	VARIABLE	240-03-P2 WORK-SHIFT HOURS	00010800

7 Floating point variable (Fvariable) 146 has been modified due to the increased number of aircraft the model now encompasses. If it is desired to operate the model "on condition", use a dummy input as follows:

Initial MH6(26, 1-24), K30000

8 Variable 147 has been generalized to make it a function of the input parameter save value X189 (the PMP interval). This variable is employed in the model's PMP logic test. It was felt that the model should be suitable for changes in PMP intervals without logic change. Thus, this variable was defined to make the PMP logic test functionally dependent upon an input rather than logically dependent upon a constant, as was previously the case.

9 Variable 148 was generalized in the same manner as variable 147. Variable 148 is employed in the PMI logic tests within the model. Again, it was felt that all PMI logic should be generalized to be a function of input parameters, rather than allowing logic to be dependent functionally upon a constant within the coding of the model.

10 Variable 150 has been modified, due to the increase in model size to accommodate a platoon size of 24 aircraft.

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11 Variables 206 through 211 have been modified to provide new save value numbers for test hop flight hours, aborted flights, and aborted hours. This change was made necessary by modifying the model to handle 24 aircraft.

12 Floating point variables 214 and 215 have been modified to use the new save value numbers for aborted and test hop flight hours in the maintenance man-hour per flight-hour calculation and platoon flight time summation, respectively.

13 Floating point variable 216 has been modified to make the availability dependent upon input definition of the run duration, rather than functionally dependent upon a constant within the variable.

This has been accomplished by incorporating MX1 (5,1) (run duration) in the variable statement in place of the original value of 6720. Furthermore, this variable has been modified to handle NORS time by inclusion of X*3.

14 Floating point variable 217 has also been modified to generalize the availability for the platoon with respect to the number of aircraft per platoon and the run duration of the simulation, by use of X191 and MX1(5,1), respectively. Also, this variable required modification to allow for the accountability of NORS downtime which was previously not considered in the baseline UH-1 Government-furnished model. The NORS delays are administered by inclusion of X1425 in the variable definition.

15 Floating point variable 220 has been modified to employ the new save value number for platoon-aborted flight hours in the availability calculation.

16 Variable 231 has been defined to generate a six-digit random number module X189, which is the PMP interval. This variable is employed in routine ZZB of the model, to initialize the P40 value that is representative of the initial airframe values of each aircraft. This variable provides generality in that the modulization based on X189, which is an input parameter, enables the airframes to be initialized with values ranging from 1/10 of an hour to 99,999.9 hours. If the situation were ever to arise that a PMP interval of greater than 100,000 hours was desired, this variable would require redefinition.

17 Variable 232 has been established to define save values for the accounting of NORS per aircraft. P14 keeps track of the tail number of each aircraft and, with the constant K 1400 added to it, ensures save values in the range from 1401 to 1424 for NORS accounting.

234	VARIABL	<1557+P10	SAVEVALUE 47-9414JLATION TEST 45PR BY ACPT	07016000
235	VARIABL	<750+P14	SAVEVALUE 47-43JLATION TEST 47PR BY ACPT R/M	00016100
236	VARIABL	<1475+P14	TEST 47P FLT, 429 SAVE 47.9-TOTAL	07016200
237	VARIABL	<775+P13	TEST 47P FLT, 429 SAVE 47.9-MONTHLY	07016300
238	VARIABL	<1373+P14	FLT, 43JRTS- SAVE 47.9 - TOTAL	00016400
239	VARIABL	<1823+P14	FLT, 43JRTS- SAVE 47.9 - MONTHLY	07016500
240	VARIABL	<1509+P18	43JRT FLIGHT 47JRS- SAVE 47.9-TOTAL	07016600
241	VARIABL	<1833+P18	43JRT FLIGHT 47JRS- SAVE 47.9-MONTHLY	07016700
242	VARIABL	(X+1+X+2)+10	SAVEVALUE 9J44ATJN & JNITS CONVERSION	07016800
243	VARIABL	07/(X+3+X+4+X+5)	CONVERSION TO RATIO	00016900
244	VARIABL	(X557+X575)+10/(X275+X900+X1875)	AVAIL. CALC.	07017000
245	VARIABL	X275+X900+X1875	SAVEVALUE 9J44ATJN	07017100
246	VARIABL	(C1-X+1-X+3)+10000/C1	A/C AVAIL TIME	07017200
247	VARIABL	(X191+C1-X675-X1825)+10000/(X191+C1)		07017300
248	VARIABL	X+1+10000/X+2	ACPT 47RTS, AVAIL PERCENT MISSING COM	07017400
249	VARIABL	(X+1+X+2)+10000/X+3	ACPT 47RTS, AVAIL, MISSING RATIO	07017500
250	VARIABL	(X237+X1850)+10000/X225	PLAT, MONTHLY AVAIL-MISS, RATIO	07017600
251	VARIABL	X237+10000/X225	PLAT, MONTHLY AVAIL, PERCENT MISSING	07017700
252	VARIABL	X18+X325	SAVEVALUE 47-43JLATION SCHED MAINT MM BY ACPT	07017800
253	VARIABL	X18+X125	SAVEVALUE 47-43JLATION SCHED MAINT MM BY ACPT	07017900
254	VARIABL	51+332+630+637		07018000
255	VARIABL	(331+337)+490		07018100
256	VARIABL	(331+332)+560		07018200
257	VARIABL	(331+337)+490		07018300
258	VARIABL	(331+337)+450		07018400
259	VARIABL	(X+11/(X+11+(X199/101)))+1000		07018500
260	VARIABL	(X+11/(X+11+(X199/101+X197)))+10000		07018600
261	VARIABL	(X+11+X10006241)+X199		07018700
262	VARIABL	X126+1800		07018800

18 Variable 234 has been defined to generalize the interaction between PMP interval, defined by input X189, and the mission duration, defined through function table 4. This variable established a window, so to speak, through which a PMP inspection can be activated. For example, if X189, the PMP interval, is 100 hours and the value chosen from function table 4 is 2 hours, as a mission length, the value of V234 is 98 hours. This variable is then employed in the logic to test if the time on the aircraft is greater than or equal to 98 hours, yet less than 100 hours. If this is the case, the aircraft requires and, therefore, receives a PMP inspection. The original logic of the model employed constants in these tests, which meant that the model functionally and logically was dependent upon the PMP interval and mission length of the UK-1 aircraft. Thus, this area was modified to provide generality to help accomplish the required comparative analysis.

19 Variable 235 has been defined to perform a function similar to that of variable 234, except that variable 235 is employed to define the window through which the PMI inspection logic is accessible.

20 Variable 236 defines a window by which the calendar PMP logic is activated.

21 Variable 237 generates a -720 for use in the checks for daily maintenance whenever 3 nonflying days in a row are encountered.

22 Variable 239 tabulates the time since last daily inspection.

23 Variable 240 established save values to count the number of dailies.

24 Variable 241 establishes save values for tabulating missions completed.

25 Boolean variable (BVARIABLE) 17 has been generalized through the use of input X194 - the number of ready aircraft required to hold maintenance personnel overtime - rather than a constant in the variable definition.

26 Boolean variable 19 is a new variable which has been defined to preclude maintenance being performed during off-shift hours.

27 Boolean variable 20 has been added to ensure that only flying aircraft get dailies (except when 72 nonflying hours expire).

18						
19	034	VARTAL	X199-PV4	GENERAL		00019000
20	035	VARTAL	X199-PV4	GENERAL		00019000
21	036	VARTAL	X199-X196		000 CALENDAR WYNDOM	00019010
22	037	VARTAL	720-1000		DAILY REGTIME	00019011
23	038	VARTAL	C1-P45			00019020
24	039	VARTAL	P1-P25		DAILY REGTIME	00019030
25	040	VARTAL	P1-P25		WTSSTING COMPLETED	00019060
26	041	VARTAL	V20'3'250		0004V 47 POST FLIGHT	00019100
27	042	VARTAL	V20'3'250		0004V 47 REGTIME	00019200
	043	VARTAL	V20'3'4166-V20'3'450			00019300
	044	VARTAL	P25'3'41359			00019400
	045	VARTAL	V20'3'230			00019500
	046	VARTAL	V20'3'4220-V20'3'4185		DAILY OUT OF MAINT.	00019600
	047	VARTAL	P17'3'49			00019700
28	048	VARTAL	V104'3'X194-P9'2'10P26'2'1		VERTIME TEST	00019800
29	049	VARTAL	P10'3'2-P10'3'5			00019900
30	050	VARTAL	V21'3'460-V20'3'4220-L914		OFF SHIPT TEST CHECK	00020000
31	051	VARTAL	V21'3'4185-V20'3'3E'4720		FLYING AC GET DAILY	00020010
	052	VARTAL	4.10.22			00020100
	053	VARTAL	4.2.2			00020200
	054	VARTAL	4.45.9			00020300
	055	VARTAL	4.35.0			00020400

28 Matrix 6 has been expanded to handle up to 24 aircraft and 24 TBO items.

29 Function table 2 has been modified by inclusion of Event 8 - PMI probability of success.

26	6	467814	4,28,24						03020500
	1	467814	4,19,13						03020600
	2	467814	4,15,27						03020700
	3	467814	4,12,11						03020800
	4	467814	4,7,10						03020900
	5	467814	4,45,0						03021000
	1	TABLE	017,1,1,27	NUMBER INSPECTIONS PERFORMED					03021100
	2	TABLE	04,0,1,11	FLIGHTS BY INSPECTION TYPE					03021200
	3	TABLE	017,1,1,27	NUMBER INSPECTIONS					03021300
	4	TABLE	010,1,1,27	MAINT BY MAINT DISCOVERED					03021400
	5	TABLE	03,0,1,45	MAINT BY SYSTEM					03021500
	6	TABLE	017,1,1,27	MAINT BY SYSTEM & WHEN DISCOVERED					03021600
	7	TABLE	0406,0,1,300						03021700
	8	TABLE	056,20,20,125	ORGANIZATIONAL DATA					03021800
	9	TABLE	060,20,20,250	ORGANIZATIONAL DATA					03021900
	10	TABLE	0406,0,1,300	EVENTS					03022000
	11	TABLE	0406,0,1,300	CANONICALIZED PARTS					03022100
	12	TABLE	0406,0,1,300	PARTS CANONICALIZED BY SERVICE PLATOON					03022200
	13	TABLE	0406,0,1,300	PARTS & MAINT BY SERVICE PLATOON					03022300
	14	TABLE	056,1,20,125	DATA FOR AIRCRAFT PART REPAIR					03022400
	15	TABLE	0406,0,1,300						03022500
		0378152	053-952,000						03022600
									03022700
									03022800
									03022900
									03023000
									03023100
									03023200
29	2	FUNCTION	017,18	GROUND EVENT (SUCCESS)					03023300
	1	0000002	0000005	0000008	0000011	00000016	5000000		03023400
	17	000000121	0000000						03023500
									03023600
									03023700
									03023800
									03023900
									03024000
									03024100
									03024200
									03024300
									03024400
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									03024900
									03025000
									03025100
									03025200
									03025300
									03025400
									03025500
									03025600
									03025700
									03025800
									03025900
									03026000
									03026100

29 Function 9. This sorting function has been modified by the addition of the event number 8 and its subsequent functional value of FN56. The inclusion of this change to the function table enables the model to detect multiple maintenance actions at the intermediate inspection through function table 56.

29 Function table 15. This is a sorting function that has been modified by the addition of element number 8 and its function value FN57. Function 57 is the table defined which provides the probability of maintenance by various systems, given a maintenance action at the intermediate inspection.

29	10	FUNCTION	AVI, 20	WHEN DISCOVERED BY MULTI-FAILURE	0.0026200
	2	AVI 5	AVI 6	AVI 7	0.0026300
	16	AVI 17	AVI 21	AVI 25	0.0026400
					0.0026500
					0.0026600
	10	FUNCTION	AVI, 20	MULT 44/44 DURING FLIGHT	0.0026700
		0.00001	0.00002	0.00003	0.0026800
					0.0026900
					0.0027000
	11	FUNCTION	AVI, 23	MULT 44/44 DURING PREFLIGHT	0.0027100
		0.00001	0.00002	0.00003	0.0027200
					0.0027300
					0.0027400
	12	FUNCTION	AVI, 26	(MULT 44/44 D DAILY)	0.0027500
		0.10000	0.30003	0.50004	0.70005
					0.90006
					0.00007
					0.0027600
					0.0027700
					0.0027800
					0.0027900
	13	FUNCTION	AVI, 22	MULT 44/44 DURING AIRCRAFT	0.0028000
		0.00001	0.00002		0.0028100
					0.0028200
					0.0028300
	14	FUNCTION	AVI, 25	MULT 44/44 DURING	0.0028400
		0.10000	0.20003	0.30004	0.40005
					0.50006
					0.60007
					0.70008
					0.80009
					0.90010
29	15	FUNCTION	AVI, 28	WHEN DISCOVERED BY SYSTEM FAILURE	0.0029000
	2	AVI 5	AVI 6	AVI 7	0.0029100
	16	AVI 17	AVI 21	AVI 25	0.0029200
					0.0029300
	16	FUNCTION	AVI, 31	SYSTEM 44 AIRCRAFT/AIRCRAFT	0.0029400
		0.244101	0.265612	0.362503	0.401002
					0.439005
					0.455106
		0.566107	0.595308	0.703109	0.752110
					0.000011
	17	FUNCTION	AVI, 31	SYSTEM 44 IN-FLIGHT/IN-FLIGHT	0.0029500
		0.244101	0.265612	0.362503	0.401002
					0.439005
					0.455106
		0.566107	0.595308	0.703109	0.752110
					0.000011
	18	FUNCTION	AVI, 32	SYSTEM 44 AIRCRAFT IN-FLIGHT/ABT IN-FLY	0.0029600
		0.314201	0.021301	0.049703	0.056503
					0.071003
					0.170303
		0.199704	0.205504	0.220005	0.227107
					0.234207
					0.241307
		0.255507	0.276909	0.354809	0.393209
					0.397409
					0.411609
		0.318710	0.440010	0.730411	0.766311
					0.851311
					0.858411
		0.963511	0.986111	0.999911	
					0.0030000
	19	FUNCTION	AVI, 31	SYSTEM 44 PREFLIGHT/IN-FLIGHT	0.0030100
		0.244101	0.265612	0.362503	0.401002
					0.439005
					0.455106
		0.566107	0.595308	0.703109	0.752110
					0.000011
	20	FUNCTION	AVI, 31	SYSTEM 44 DAILY/IN-FLIGHT	0.0030200
		0.244101	0.303602	0.393003	0.429304
					0.500105
					0.500406
		0.507407	0.634208	0.750209	0.884010
					0.999911
	21	FUNCTION	AVI, 31	SYSTEM 44 PERIODIC/IN-FLIGHT	0.0030300
		0.333001	0.363002	0.429503	0.484304
					0.473905
					0.510906
					0.0031000
					0.0031100
					0.0031200

29 Function table 23. Again, this is a sorting function that has been modified by the addition of element number 8 and its function value FN 29. Function 29 provides the probability of any element of a system being detected as a failed item in a system, given a maintenance action in this system. Due to the paucity of data on the CH-47C and HLH at the elemental level, this function table is the same as the function table employed at the periodic inspection. If data on another aircraft was of such a quantity that a distinction could be drawn between the elemental probability of occurrence between the intermediate inspection and periodic inspection, it would be suggested that function table 23 be modified to use a function value of FN58 for element number 8 and a new function table 58 be defined of a form similar to that of function table 29. This would give the elemental probability of occurrence at the intermediate inspection, given a system maintenance action at the intermediate inspection.

0.560007		0.570009		0.620003		0.703510		0.999911				
22		FUNCTION		P3, L11		4J432A 3F		ELEMENTS IN SYSTEMS				
01	26	02	10	03	62	04	95	05	19	06	12	
07	27	09	04	09	42	10	23	11	34			
00031300												
00031400												
00031500												
00031600												
00031700												
00031800												
00031900												
00032000												
00032100												
00032200												
00032300												
00032400												
00032500												
00032600												
00032700												
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00032900												
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00035600												
00035700												
00035800												
00035900												
00036000												
00036100												
00036200												
00036300												

0022	015	1023	002	1002	020	1002	025	1003	011	1003	031	00035000
0024	017	1024	003	1003	011	1005	104	1005	002	1006	002	00035500
0027	032	1027	017	1004	010	1004	020	1000	007	1000	000	00035500
0010	011	1010	007	1010	015	1011	015	1011	070	1012	031	00035700
0012	013	1012	011	1101	010	1102	013	1102	016	1102	001	00035800
0104	011	1103	003	1103	014	1103	123	1104	000	1105	012	00036300
0115	015	1104	002	1107	015	1107	025	1108	001	1108	005	00037000
0100	013	1102	015	1110	010	1110	021	1111	001	1111	004	00037100
0112	013	1112	013	1113	012	1113	007	1114	015	1114	001	00037200
0115	011	1115	003	1116	021	1116	001	1117	000			00037300
25	010	1101	015	1102	010	0102	011	0103	142	0103	006	00037400
0100	013	0100	010	0105	012	0105	011	0106	011	0106	005	00037500
0107	014	0107	002	0109	175	0108	102	0109	012	0109	001	00037700
0110	010	0110	002	0111	010	0111	011	0112	050	0112	023	00037800
0113	010	0113	007	0201	010	0202	012	0202	002	0203	021	00037900
0203	017	0204	010	0204	054	0205	011	0205	000	0206	012	00038000
0206	010	0207	001	0208	000	0208	012	0209	012	0209	001	00038100
0210	009	0211	005	0301	102	0301	013	0301	004	0302	013	00038200
0302	000	0302	003	0303	013	0303	025	0303	001	0304	011	00038300
0304	012	0305	000	0306	001	0307	011	0308	001	0308	001	00038500
0309	013	0310	002	0311	013	0312	012	0313	013	0314	001	00038500
0315	011	0315	011	0317	013	0318	011	0319	003	0320	002	00038600
0321	015	0322	011	0323	001	0324	011	0325	011	0326	003	00038700
0327	013	0328	002	0329	025	0330	013	0331	012	0332	003	00038800
0333	013	0334	005	0335	013	0336	010	0337	011	0337	011	00038900
0338	010	0339	012	0340	012	0340	012	0341	011	0342	000	00039000
0343	010	0344	010	0345	012	0345	011	0346	010	0347	012	00039100
0348	010	0349	010	0350	010	0351	013	0351	013	0401	025	00039200
0401	010	0402	015	0403	010	0403	012	0403	000	0404	007	00039300
0405	017	0405	015	0405	012	0406	012	0406	010	0407	021	00039400
0407	012	0408	017	0409	010	0409	012	0409	010	0410	002	00039500
0410	010	0411	012	0412	012	0412	017	0413	010	0413	005	00039600
0411	012	0411	012	0411	015	0412	017	0412	010	0413	010	00039700
0415	010	0415	015	0416	010	0416	013	0416	015	0416	013	00039800
0416	010	0417	015	0417	010	0417	012	0417	010	0418	003	00039900
0418	011	0419	011	0420	011	0420	017	0420	010	0421	018	00040000
0419	011	0420	011	0421	015	0421	011	0421	010	0421	018	00040100
0420	011	0421	011	0422	015	0422	011	0422	010	0422	018	00040200
0421	011	0422	011	0423	015	0423	011	0423	010	0423	018	00040300
0422	011	0423	011	0424	015	0424	011	0424	010	0424	018	00040400
0423	011	0424	011	0425	015	0425	011	0425	010	0425	018	00040500
0424	011	0425	011	0426	015	0426	011	0426	010	0426	018	00040600
0425	011	0426	011	0427	015	0427	011	0427	010	0427	018	00040700
0426	011	0427	011	0428	015	0428	011	0428	010	0428	018	00040800
0427	011	0428	011	0429	015	0429	011	0429	010	0429	018	00040900
0428	011	0429	011	0430	015	0430	011	0430	010	0430	018	00041000
0429	011	0430	011	0431	015	0431	011	0431	010	0431	018	00041100
0430	011	0431	011	0432	015	0432	011	0432	010	0432	018	00041200
0431	011	0432	011	0433	015	0433	011	0433	010	0433	018	00041300
0432	011	0433	011	0434	015	0434	011	0434	010	0434	018	00041400
0433	011	0434	011	0435	015	0435	011	0435	010	0435	018	00041500
0434	011	0435	011	0436	015	0436	011	0436	010	0436	018	00041600
0435	011	0436	011	0437	015	0437	011	0437	010	0437	018	00041700
0436	011	0437	011	0438	015	0438	011	0438	010	0438	018	00041800
0437	011	0438	011	0439	015	0439	011	0439	010	0439	018	00041900
0438	011	0439	011	0440	015	0440	011	0440	010	0440	018	00042000
0439	011	0440	011	0441	015	0441	011	0441	010	0441	018	00042100
0440	011	0441	011	0442	015	0442	011	0442	010	0442	018	00042200
0441	011	0442	011	0443	015	0443	011	0443	010	0443	018	00042300
0442	011	0443	011	0444	015	0444	011	0444	010	0444	018	00042400
0443	011	0444	011	0445	015	0445	011	0445	010	0445	018	00042500
0444	011	0445	011	0446	015	0446	011	0446	010	0446	018	00042600
0445	011	0446	011	0447	015	0447	011	0447	010	0447	018	00042700
0446	011	0447	011	0448	015	0448	011	0448	010	0448	018	00042800
0447	011	0448	011	0449	015	0449	011	0449	010	0449	018	00042900
0448	011	0449	011	0450	015	0450	011	0450	010	0450	018	00043000
0449	011	0450	011	0451	015	0451	011	0451	010	0451	018	00043100
0450	011	0451	011	0452	015	0452	011	0452	010	0452	018	00043200
0451	011	0452	011	0453	015	0453	011	0453	010	0453	018	00043300
0452	011	0453	011	0454	015	0454	011	0454	010	0454	018	00043400
0453	011	0454	011	0455	015	0455	011	0455	010	0455	018	00043500
0454	011	0455	011	0456	015	0456	011	0456	010	0456	018	00043600
0455	011	0456	011	0457	015	0457	011	0457	010	0457	018	00043700
0456	011	0457	011	0458	015	0458	011	0458	010	0458	018	00043800
0457	011	0458	011	0459	015	0459	011	0459	010	0459	018	00043900
0458	011	0459	011	0460	015	0460	011	0460	010	0460	018	00044000
0459	011	0460	011	0461	015	0461	011	0461	010	0461	018	00044100
0460	011	0461	011	0462	015	0462	011	0462	010	0462	018	00044200
0461	011	0462	011	0463	015	0463	011	0463	010	0463	018	00044300
0462	011	0463	011	0464	015	0464	011	0464	010	0464	018	00044400
0463	011	0464	011	0465	015	0465	011	0465	010	0465	018	00044500
0464	011	0465	011	0466	015	0466	011	0466	010	0466	018	00044600
0465	011	0466	011	0467	015	0467	011	0467	010	0467	018	00044700
0466	011	0467	011	0468	015	0468	011	0468	010	0468	018	00044800
0467	011	0468	011	0469	015	0469	011	0469	010	0469	018	00044900
0468	011	0469	011	0470	015	0470	011	0470	010	0470	018	00045000
0469	011	0470	011	0471	015	0471	011	0471	010	0471	018	00045100
0470	011	0471	011	0472	015	0472	011	0472	010	0472	018	00045200
0471	011	0472	011	0473	015	0473	011	0473	010	0473	018	00045300
0472	011	0473	011	0474	015	0474	011	0474	010	0474	018	00045400
0473	011	0474	011	0475	015	0475	011	0475	010	0475	018	00045500
0474	011	0475	011	0476	015	0476	011	0476	010	0476	018	00045600
0475	011	0476	011	0477	015	0477	011	0477	010	0477	018	00045700
0476	011	0477	011	0478	015	0478	011	0478	010	0478	018	00045800
0477	011	0478	011	0479	015	0479	011	0479	010	0479	018	00045900
0478	011	0479	011	0480	015	0480	011	0480	010	0480	018	00046000
0479	011	0480	011	0481	015	0481	011	0481	010	0481	018	00046100
0480	011	0481	011	0482	015	0482	011	0482	010	0482	018	00046200
0481	011	0482	011	0483	015	0483	011	0483	010	0483	018	00046300
0482	011	0483	011	0484	015	0484	011	0484	010	0484	018	00046400
0483	011	0484	011	0485	015	0485	011	0485	010	0485	018	00046500
0484	011	0485	011	0486	015	0486	011	0486	010	0486	018	00046600
0485	011	0486	011	0487	015	0487	011	0487	010	0487	018	00046700
04												

1008	007	1007	003	1005	011	1005	104	1006	002	1006	002	00001500
1007	002	1007	007	1009	000	1009	000	1009	007	1009	009	00001600
1010	011	1010	007	1010	005	1011	013	1011	009	1012	011	00001700
1012	005	1010	011	1010	010	1012	003	1012	016	1102	001	00001800
1103	011	1103	005	1103	000	1104	103	1104	000	1105	012	00001900
1105	009	1106	002	1107	014	1107	006	1109	001	1109	005	00002000
1109	003	1109	015	1111	000	1110	001	1111	001	1111	004	00002100
1112	003	1112	000	1113	002	1113	007	1114	015	1114	001	00002200
1115	001	1115	000	1116	021	1116	001	1117	000			00002300
25	JUNCTION 0045. L203 0000 ELEMENT 44 0000 IN-FLIGHT/8V 0000 FLT 0000											
0101	000	0101	000	0102	000	0102	000	0103	000	0103	000	00002400
0104	000	0104	000	0105	000	0105	000	0106	000	0106	000	00002500
0107	000	0107	000	0109	000	0109	000	0109	000	0109	000	00002600
0110	000	0110	000	0111	000	0111	000	0112	000	0112	000	00002700
0113	000	0113	000	0201	000	0202	000	0202	000	0203	000	00002800
0203	000	0204	000	0204	000	0205	000	0205	000	0206	000	00002900
0204	000	0207	000	0209	000	0209	000	0209	000	0209	000	00003000
0210	000	0211	000	0211	000	0301	000	0301	000	0302	000	00003100
0302	000	0302	000	0303	000	0303	000	0303	000	0304	000	00003200
0308	000	0305	000	0306	000	0307	000	0308	000	0309	000	00003300
0309	000	0310	000	0311	000	0312	000	0313	000	0314	000	00003400
0315	000	0314	000	0317	000	0319	000	0319	000	0320	000	00003500
0321	000	0322	000	0323	000	0324	000	0325	000	0326	000	00003600
0327	000	0329	000	0329	000	0330	000	0331	000	0332	000	00003700
0331	000	0334	000	0335	000	0336	000	0337	000	0337	000	00003800
0338	000	0339	000	0339	000	0340	000	0341	000	0342	000	00003900
0343	000	0344	000	0345	000	0345	000	0346	000	0347	000	00004000
0348	000	0349	000	0350	000	0351	000	0351	000	0401	000	00004100
0401	000	0402	000	0402	000	0403	000	0403	000	0404	000	00004200
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0407	000	0408	030	0408	030	0409	030	0409	000	0410	000	07064500
0410	000	0411	030	0412	030	0412	030	0413	000	0413	000	07064600
0501	000	0501	000	0501	030	0502	030	0502	000	0503	000	07064700
0503	000	0504	000	0504	030	0505	030	0505	000	0506	000	07064800
0506	000	0507	000	0507	030	0508	030	0508	000	0509	000	07064900
0509	000	0601	000	0601	030	0602	000	0603	000	0603	000	07065000
0604	030	0604	000	0605	030	0605	030	0606	000	0606	000	07065100
0607	030	0701	000	0702	030	0702	030	0703	000	0703	000	07065200
0704	000	0704	000	0705	030	0705	030	0707	000	0707	000	07065300
0708	030	0708	000	0709	030	0709	030	0709	000	0710	000	07065400
0710	000	0711	000	0711	030	0712	030	0712	000	0713	000	07065500
0713	000	0714	000	0715	030	0715	030	0801	000	0801	000	07065600
0802	000	0802	000	0801	579	0801	030	0801	000	0802	211	07065700
0802	000	0802	000	0803	135	0803	030	0804	135	0804	000	07065800
0804	030	0805	000	0805	030	0806	030	0806	000	0807	000	07065900
0807	000	0807	000	0808	030	0808	030	0809	000	0809	000	07066000
0809	030	0810	000	0810	030	0811	030	0811	000	0812	000	07066100
0812	000	0813	000	0814	030	0815	030	0816	000	0817	000	07066200
0818	000	0818	000	0819	030	0820	030	0821	000	0821	000	07066300
0822	030	0823	000	1002	030	1002	030	1003	000	1003	000	07066400
1004	030	1004	000	1005	230	1005	030	1006	000	1006	000	07066500
1007	030	1007	000	1008	030	1008	030	1009	000	1009	000	07066600
1010	030	1010	000	1010	030	1011	030	1011	000	1012	000	07066700
1012	000	1101	000	1101	030	1102	319	1102	000	1102	000	07066800
1103	063	1103	000	1103	030	1104	030	1104	000	1105	000	07066900

20) Function tables 32, 33, 34, 35 and 37. For each of these functions, the function table definition card for HLH and CH-47 models P22 has been replaced by FN46. That is, whenever these function tables are addressed, function 46 will be used to indicate which element of the function table is to be selected. As previously defined, parameter 22 was used to identify the element that was to be selected. Also on the function definition card, these function tables have been modified from discrete function tables with a D identifier to list-type functions with an L identifier for the number of discrete points in the function table. Due to the occurrence in the CH-47C model of multiple maintenance actions on the same element number, it was necessary to modify these tables to list-type functions. Discrete function tables do not provide the analyst with the ability to keep the same functional X value for the table for various points within the function tables. That is, for discrete function tables, the X value must be monotonic increasing. It was desirable to provide the analyst with a method of keeping all the various elemental values of these function tables compatible with the work breakdown structure or element identification number system employed. These tables have been modified to list-type tables. It should be noted here, however, that in the situation where list function tables are employed, the X value of the function table is not even analyzed by the computer. Rather, it merely assumes that the Y values of the function table are related to numbers running from 1 to the total number of discrete data points for the function table as defined on the function table specification card. Function table 46, which defines the element number in terms of a number running from 1 to the discrete number of data points in the model as a function of the inputted element numbers, is significant to the proper actuation of the model. These element numbers are dummies when a model has more than one task per element number. They have been biased to conform to requirements of a discrete function table that the element numbers be monotonic increasing. However, it is felt that this bias, which is merely a manipulative problem and has nothing to do with the proper functioning of the model, in no way distorts the results of the model and, furthermore, allows the analyst to properly code his element numbers with respect to all the R&M data for all other function tables of the model.

1135	000	1136	000	1107	132	1107	000	1109	013	1109	000	00067000
1139	152	1139	000	1110	076	1110	000	1111	025	1111	000	00067100
1112	000	1112	000	1113	000	1113	000	1114	000	1114	000	00067200
1115	000	1115	000	1116	000	1116	000	1117	000			00067300

30	0131	0132	0133	0134	0135	0136	0137	0138	0139	0140	0141	0142	0143	0144	0145	0146	0147	0148	0149	0150	0151	0152	0153	0154	0155	0156	0157	0158	0159	0160	0161	0162	0163	0164	0165	0166	0167	0168	0169	0170	0171	0172	0173	0174	0175	0176	0177	0178	0179	0180	0181	0182	0183	0184	0185	0186	0187	0188	0189	0190	0191	0192	0193	0194	0195	0196	0197	0198	0199	0200	0201	0202	0203	0204	0205	0206	0207	0208	0209	0210	0211	0212	0213	0214	0215	0216	0217	0218	0219	0220	0221	0222	0223	0224	0225	0226	0227	0228	0229	0230	0231	0232	0233	0234	0235	0236	0237	0238	0239	0240	0241	0242	0243	0244	0245	0246	0247	0248	0249	0250	0251	0252	0253	0254	0255	0256	0257	0258	0259	0260	0261	0262	0263	0264	0265	0266	0267	0268	0269	0270	0271	0272	0273	0274	0275	0276	0277	0278	0279	0280	0281	0282	0283	0284	0285	0286	0287	0288	0289	0290	0291	0292	0293	0294	0295	0296	0297	0298	0299	0300	0301	0302	0303	0304	0305	0306	0307	0308	0309	0310	0311	0312	0313	0314	0315	0316	0317	0318	0319	0320	0321	0322	0323	0324	0325	0326	0327	0328	0329	0330	0331	0332	0333	0334	0335	0336	0337	0338	0339	0340	0341	0342	0343	0344	0345	0346	0347	0348	0349	0350	0351	0352	0353	0354	0355	0356	0357	0358	0359	0360	0361	0362	0363	0364	0365	0366	0367	0368	0369	0370	0371	0372	0373	0374	0375	0376	0377	0378	0379	0380	0381	0382	0383	0384	0385	0386	0387	0388	0389	0390	0391	0392	0393	0394	0395	0396	0397	0398	0399	0400	0401	0402	0403	0404	0405	0406	0407	0408	0409	0410	0411	0412	0413	0414	0415	0416	0417	0418	0419	0420	0421	0422	0423	0424	0425	0426	0427	0428	0429	0430	0431	0432	0433	0434	0435	0436	0437	0438	0439	0440	0441	0442	0443	0444	0445	0446	0447	0448	0449	0450	0451	0452	0453	0454	0455	0456	0457	0458	0459	0460	0461	0462	0463	0464	0465	0466	0467	0468	0469	0470	0471	0472	0473	0474	0475	0476	0477	0478	0479	0480	0481	0482	0483	0484	0485	0486	0487	0488	0489	0490	0491	0492	0493	0494	0495	0496	0497	0498	0499	0500	0501	0502	0503	0504	0505	0506	0507	0508	0509	0510	0511	0512	0513	0514	0515	0516	0517	0518	0519	0520	0521	0522	0523	0524	0525	0526	0527	0528	0529	0530	0531	0532	0533	0534	0535	0536	0537	0538	0539	0540	0541	0542	0543	0544	0545	0546	0547	0548	0549	0550	0551	0552	0553	0554	0555	0556	0557	0558	0559	0560	0561	0562	0563	0564	0565	0566	0567	0568	0569	0570	0571	0572	0573	0574	0575	0576	0577	0578	0579	0580	0581	0582	0583	0584	0585	0586	0587	0588	0589	0590	0591	0592	0593	0594	0595	0596	0597	0598	0599	0600	0601	0602	0603	0604	0605	0606	0607	0608	0609	0610	0611	0612	0613	0614	0615	0616	0617	0618	0619	0620	0621	0622	0623	0624	0625	0626	0627	0628	0629	0630	0631	0632	0633	0634	0635	0636	0637	0638	0639	0640	0641	0642	0643	0644	0645	0646	0647	0648	0649	0650	0651	0652	0653	0654	0655	0656	0657	0658	0659	0660	0661	0662	0663	0664	0665	0666	0667	0668	0669	0670	0671	0672	0673	0674	0675	0676	0677	0678	0679	0680	0681	0682	0683	0684	0685	0686	0687	0688	0689	0690	0691	0692	0693	0694	0695	0696	0697	0698	0699	0700	0701	0702	0703	0704	0705	0706	0707	0708	0709	0710	0711	0712	0713	0714	0715	0716	0717	0718	0719	0720	0721	0722	0723	0724	0725	0726	0727	0728	0729	0730	0731	0732	0733	0734	0735	0736	0737	0738	0739	0740	0741	0742	0743	0744	0745	0746	0747	0748	0749	0750	0751	0752	0753	0754	0755	0756	0757	0758	0759	0760	0761	0762	0763	0764	0765	0766	0767	0768	0769	0770	0771	0772	0773	0774	0775	0776	0777	0778	0779	0780	0781	0782	0783	0784	0785	0786	0787	0788	0789	0790	0791	0792	0793	0794	0795	0796	0797	0798	0799	0800	0801	0802	0803	0804	0805	0806	0807	0808	0809	0810	0811	0812	0813	0814	0815	0816	0817	0818	0819	0820	0821	0822	0823	0824	0825	0826	0827	0828	0829	0830	0831	0832	0833	0834	0835	0836	0837	0838	0839	0840	0841	0842	0843	0844	0845	0846	0847	0848	0849	0850	0851	0852	0853	0854	0855	0856	0857	0858	0859	0860	0861	0862	0863	0864	0865	0866	0867	0868	0869	0870	0871	0872	0873	0874	0875	0876	0877	0878	0879	0880	0881	0882	0883	0884	0885	0886	0887	0888	0889	0890	0891	0892	0893	0894	0895	0896	0897	0898	0899	0900	0901	0902	0903	0904	0905	0906	0907	0908	0909	0910	0911	0912	0913	0914	0915	0916	0917	0918	0919	0920	0921	0922	0923	0924	0925	0926	0927	0928	0929	0930	0931	0932	0933	0934	0935	0936	0937	0938	0939	0940	0941	0942	0943	0944	0945	0946	0947	0948	0949	0950	0951	0952	0953	0954	0955	0956	0957	0958	0959	0960	0961	0962	0963	0964	0965	0966	0967	0968	0969	0970	0971	0972	0973	0974	0975	0976	0977	0978	0979	0980	0981	0982	0983	0984	0985	0986	0987	0988	0989	0990	0991	0992	0993	0994	0995	0996	0997	0998	0999	1000
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30 Function table 33 has been modified to a list-type function table.

30 Function table 34 has been modified to a list-type function table.

30 Function table 35 has been modified to a list-type function table.

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0012	0000070913	0000070914	0000070915	0000070916	0000070917	0000070918
0014	0000070919	0000070920	0000070921	0000070922	0000070923	0000070924
0022	0000070925	0000070926	0000070927	0000070928	0000070929	0000070930
1010	0000070931	0000070932	0000070933	0000070934	0000070935	0000070936
1012	0000070937	0000070938	0000070939	0000070940	0000070941	0000070942
1013	0000070943	0000070944	0000070945	0000070946	0000070947	0000070948
1014	0000070949	0000070950	0000070951	0000070952	0000070953	0000070954
1015	0000070955	0000070956	0000070957	0000070958	0000070959	0000070960
1016	0000070961	0000070962	0000070963	0000070964	0000070965	0000070966
1017	0000070967	0000070968	0000070969	0000070970	0000070971	0000070972
1018	0000070973	0000070974	0000070975	0000070976	0000070977	0000070978
1019	0000070979	0000070980	0000070981	0000070982	0000070983	0000070984
1020	0000070985	0000070986	0000070987	0000070988	0000070989	0000070990
1021	0000070991	0000070992	0000070993	0000070994	0000070995	0000070996
1022	0000070997	0000070998	0000070999	0000071000	0000071001	0000071002
1023	0000071003	0000071004	0000071005	0000071006	0000071007	0000071008
1024	0000071009	0000071010	0000071011	0000071012	0000071013	0000071014
1025	0000071015	0000071016	0000071017	0000071018	0000071019	0000071020
1026	0000071021	0000071022	0000071023	0000071024	0000071025	0000071026
1027	0000071027	0000071028	0000071029	0000071030	0000071031	0000071032
1028	0000071033	0000071034	0000071035	0000071036	0000071037	0000071038
1029	0000071039	0000071040	0000071041	0000071042	0000071043	0000071044
1030	0000071045	0000071046	0000071047	0000071048	0000071049	0000071050
1031	0000071051	0000071052	0000071053	0000071054	0000071055	0000071056
1032	0000071057	0000071058	0000071059	0000071060	0000071061	0000071062
1033	0000071063	0000071064	0000071065	0000071066	0000071067	0000071068
1034	0000071069	0000071070	0000071071	0000071072	0000071073	0000071074
1035	0000071075	0000071076	0000071077	0000071078	0000071079	0000071080
1036	0000071081	0000071082	0000071083	0000071084	0000071085	0000071086
1037	0000071087	0000071088	0000071089	0000071090	0000071091	0000071092
1038	0000071093	0000071094	0000071095	0000071096	0000071097	0000071098
1039	0000071099	0000071100	0000071101	0000071102	0000071103	0000071104
1040	0000071105	0000071106	0000071107	0000071108	0000071109	0000071110
1041	0000071111	0000071112	0000071113	0000071114	0000071115	0000071116
1042	0000071117	0000071118	0000071119	0000071120	0000071121	0000071122
1043	0000071123	0000071124	0000071125	0000071126	0000071127	0000071128
1044	0000071129	0000071130	0000071131	0000071132	0000071133	0000071134
1045	0000071135	0000071136	0000071137	0000071138	0000071139	0000071140
1046	0000071141	0000071142	0000071143	0000071144	0000071145	0000071146
1047	0000071147	0000071148	0000071149	0000071150	0000071151	0000071152
1048	0000071153	0000071154	0000071155	0000071156	0000071157	0000071158
1049	0000071159	0000071160	0000071161	0000071162	0000071163	0000071164
1050	0000071165	0000071166	0000071167	0000071168	0000071169	0000071170
1051	0000071171	0000071172	0000071173	0000071174	0000071175	0000071176
1052	0000071177	0000071178	0000071179	0000071180	0000071181	0000071182
1053	0000071183	0000071184	0000071185	0000071186	0000071187	0000071188
1054	0000071189	0000071190	0000071191	0000071192	0000071193	0000071194
1055	0000071195	0000071196	0000071197	0000071198	0000071199	0000071200
1056	0000071201	0000071202	0000071203	0000071204	0000071205	0000071206
1057	0000071207	0000071208	0000071209	0000071210	0000071211	0000071212
1058	0000071213	0000071214	0000071215	0000071216	0000071217	0000071218
1059	0000071219	0000071220	0000071221	0000071222	0000071223	0000071224
1060	0000071225	0000071226	0000071227	0000071228	0000071229	0000071230
1061	0000071231	0000071232	0000071233	0000071234	0000071235	0000071236
1062	0000071237	0000071238	0000071239	0000071240	0000071241	0000071242
1063	0000071243	0000071244	0000071245	0000071246	0000071247	0000071248
1064	0000071249	0000071250	0000071251	0000071252	0000071253	0000071254
1065	0000071255	0000071256	0000071257	0000071258	0000071259	0000071260
1066	0000071261	0000071262	0000071263	0000071264	0000071265	0000071266
1067	0000071267	0000071268	0000071269	0000071270	0000071271	0000071272
1068	0000071273	0000071274	0000071275	0000071276	0000071277	0000071278
1069	0000071279	0000071280	0000071281	0000071282	0000071283	0000071284
1070	0000071285	0000071286	0000071287	0000071288	0000071289	0000071290
1071	0000071291	0000071292	0000071293	0000071294	0000071295	0000071296
1072	0000071297	0000071298	0000071299	0000071300	0000071301	0000071302
1073	0000071303	0000071304	0000071305	0000071306	0000071307	0000071308
1074	0000071309	0000071310	0000071311	0000071312	0000071313	0000071314
1075	0000071315	0000071316	0000071317	0000071318	0000071319	0000071320
1076	0000071321	0000071322	0000071323	0000071324	0000071325	0000071326
1077	0000071327	0000071328	0000071329	0000071330	0000071331	0000071332
1078	0000071333	0000071334	0000071335	0000071336	0000071337	0000071338
1079	0000071339	0000071340	0000071341	0000071342	0000071343	0000071344
1080	0000071345	0000071346	0000071347	0000071348	0000071349	0000071350
1081	0000071351	0000071352	0000071353	0000071354	0000071355	0000071356
1082	0000071357	0000071358	0000071359	0000071360	0000071361	0000071362
1083	0000071363	0000071364	0000071365	0000071366	0000071367	0000071368
1084	0000071369	0000071370	0000071371	0000071372	0000071373	0000071374
1085	0000071375	0000071376	0000071377	0000071378	0000071379	0000071380
1086	0000071381	0000071382	0000071383	0000071384	0000071385	0000071386
1087	0000071387	0000071388	0000071389	0000071390	0000071391	0000071392
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1089	0000071399	0000071400	0000071401	0000071402	0000071403	0000071404
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0122	122	0122	122	0122	122	0122	122	0122	122	0122	122

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0012	0014	0022	1034	1037	1010	1012	1033	1034	1035	1036	1037	1038	1039	1040	1041	1042	1043	1044	1045	1046	1047	1048	1049	1050	1051	1052	1053	1054	1055	1056	1057	1058	1059	1060	1061	1062	1063	1064	1065	1066	1067	1068	1069	1070	1071	1072	1073	1074	1075	1076	1077	1078	1079	1080	1081	1082	1083	1084	1085	1086	1087	1088	1089	1090	1091	1092	1093	1094	1095	1096	1097	1098	1099	1100	1101	1102	1103	1104	1105	1106	1107	1108	1109	1110	1111	1112	1113	1114	1115	1116	1117	1118	1119	1120	1121	1122	1123	1124	1125	1126	1127	1128	1129	1130	1131	1132	1133	1134	1135	1136	1137	1138	1139	1140	1141	1142	1143	1144	1145	1146	1147	1148	1149	1150	1151	1152	1153	1154	1155	1156	1157	1158	1159	1160	1161	1162	1163	1164	1165	1166	1167	1168	1169	1170	1171	1172	1173	1174	1175	1176	1177	1178	1179	1180	1181	1182	1183	1184	1185	1186	1187	1188	1189	1190	1191	1192	1193	1194	1195	1196	1197	1198	1199	1200	1201	1202	1203	1204	1205	1206	1207	1208	1209	1210	1211	1212	1213	1214	1215	1216	1217	1218	1219	1220	1221	1222	1223	1224	1225	1226	1227	1228	1229	1230	1231	1232	1233	1234	1235	1236	1237	1238	1239	1240	1241	1242	1243	1244	1245	1246	1247	1248	1249	1250	1251	1252	1253	1254	1255	1256	1257	1258	1259	1260	1261	1262	1263	1264	1265	1266	1267	1268	1269	1270	1271	1272	1273	1274	1275	1276	1277	1278	1279	1280	1281	1282	1283	1284	1285	1286	1287	1288	1289	1290	1291	1292	1293	1294	1295	1296	1297	1298	1299	1300	1301	1302	1303	1304	1305	1306	1307	1308	1309	1310	1311	1312	1313	1314	1315	1316	1317	1318	1319	1320	1321	1322	1323	1324	1325	1326	1327	1328	1329	1330	1331	1332	1333	1334	1335	1336	1337	1338	1339	1340	1341	1342	1343	1344	1345	1346	1347	1348	1349	1350	1351	1352	1353	1354	1355	1356	1357	1358	1359	1360	1361	1362	1363	1364	1365	1366	1367	1368	1369	1370	1371	1372	1373	1374	1375	1376	1377	1378	1379	1380	1381	1382	1383	1384	1385	1386	1387	1388	1389	1390	1391	1392	1393	1394	1395	1396	1397	1398	1399	1400	1401	1402	1403	1404	1405	1406	1407	1408	1409	1410	1411	1412	1413	1414	1415	1416	1417	1418	1419	1420	1421	1422	1423	1424	1425	1426	1427	1428	1429	1430	1431	1432	1433	1434	1435	1436	1437	1438	1439	1440	1441	1442	1443	1444	1445	1446	1447	1448	1449	1450	1451	1452	1453	1454	1455	1456	1457	1458	1459	1460	1461	1462	1463	1464	1465	1466	1467	1468	1469	1470	1471	1472	1473	1474	1475	1476	1477	1478	1479	1480	1481	1482	1483	1484	1485	1486	1487	1488	1489	1490	1491	1492	1493	1494	1495	1496	1497	1498	1499	1500	1501	1502	1503	1504	1505	1506	1507	1508	1509	1510	1511	1512	1513	1514	1515	1516	1517	1518	1519	1520	1521	1522	1523	1524	1525	1526	1527	1528	1529	1530	1531	1532	1533	1534	1535	1536	1537	1538	1539	1540	1541	1542	1543	1544	1545	1546	1547	1548	1549	1550	1551	1552	1553	1554	1555	1556	1557	1558	1559	1560	1561	1562	1563	1564	1565	1566	1567	1568	1569	1570	1571	1572	1573	1574	1575	1576	1577	1578	1579	1580	1581	1582	1583	1584	1585	1586	1587	1588	1589	1590	1591	1592	1593	1594	1595	1596	1597	1598	1599	1600	1601	1602	1603	1604	1605	1606	1607	1608	1609	1610	1611	1612	1613	1614	1615	1616	1617	1618	1619	1620	1621	1622	1623	1624	1625	1626	1627	1628	1629	1630	1631	1632	1633	1634	1635	1636	1637	1638	1639	1640	1641	1642	1643	1644	1645	1646	1647	1648	1649	1650	1651	1652	1653	1654	1655	1656	1657	1658	1659	1660	1661	1662	1663	1664	1665	1666	1667	1668	1669	1670	1671	1672	1673	1674	1675	1676	1677	1678	1679	1680	1681	1682	1683	1684	1685	1686	1687	1688	1689	1690	1691	1692	1693	1694	1695	1696	1697	1698	1699	1700	1701	1702	1703	1704	1705	1706	1707	1708	1709	1710	1711	1712	1713	1714	1715	1716	1717	1718	1719	1720	1721	1722	1723	1724	1725	1726	1727	1728	1729	1730	1731	1732	1733	1734	1735	1736	1737	1738	1739	1740	1741	1742	1743	1744	1745	1746	1747	1748	1749	1750	1751	1752	1753	1754	1755	1756	1757	1758	1759	1760	1761	1762	1763	1764	1765	1766	1767	1768	1769	1770	1771	1772	1773	1774	1775	1776	1777	1778	1779	1780	1781	1782	1783	1784	1785	1786	1787	1788	1789	1790	1791	1792	1793	1794	1795	1796	1797	1798	1799	1800	1801	1802	1803	1804	1805	1806	1807	1808	1809	1810	1811	1812	1813	1814	1815	1816	1817	1818	1819	1820	1821	1822	1823	1824	1825	1826	1827	1828	1829	1830	1831	1832	1833	1834	1835	1836	1837	1838	1839	1840	1841	1842	1843	1844	1845	1846	1847	1848	1849	1850	1851	1852	1853	1854	1855	1856	1857	1858	1859	1860	1861	1862	1863	1864	1865	1866	1867	1868	1869	1870	1871	1872	1873	1874	1875	1876	1877	1878	1879	1880	1881	1882	1883	1884	1885	1886	1887	1888	1889	1890	1891	1892	1893	1894	1895	1896	1897	1898	1899	1900	1901	1902	1903	1904	1905	1906	1907	1908	1909	1910	1911	1912	1913	1914	1915	1916	1917	1918	1919	1920	1921	1922	1923	1924	1925	1926	1927	1928	1929	1930	1931	1932	1933	1934	1935	1936	1937	1938	1939	1940	1941	1942	1943	1944	1945	1946	1947	1948	1949	1950	1951	1952	1953	1954	1955	1956	1957	1958	1959	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050	2051	2052	2053	2054	2055	2056	2057	2058	2059	2060	2061	2062	2063	2064	2065	2066	2067	2068	2069	2070	2071	2072	2073	2074	2075	2076	2077	2078	2079	2080	2081	2082	2083	2084	2085	2086	2087	2088	2089	2090	2091	2092	2093	2094	2095	2096	2097	2098	2099	2100	2101	2102	2103	2104	2105	2106	2107	2108	2109	2110	2111	2112	2113	2114	2115	2116	2117	2118	2119	2120	2121	2122	2123	2124	2125	2126	2127	2128	2129	2130	2131	2132	2133	2134	2135	2136	2137	2138	2139	2140	2141	2142	2143	2144	2145	2146	2147	2148	2149	2150	2151	2152	2153	2154	2155	2156	2157	2158	2159	2160	2161	2162	2163	2164	2165	2166	2167	2168	2169	2170	2171	2172	2173	2174	2175	2176	2177	2178	2179	2180	2181	2182	2183	2184	2185	2186	2187	2188	2189	2190	2191	2192	2193	2194	2195	2196	2197	2198	2199	2200	2201	2202	2203	2204	2205	2206	2207	2208	2209	2210	2211	2212	2213	2214	2215	2216	2217	2218	2219	2220	2221	2222	2223	2224	2225	2226	2227	2228	2229	2230	2231	2232	2233	2234	2235	2236	2237	2238	2239	2240	2241	2242	2243	2244	2245	2246	2247	2248	2249	2250	2251	2252	2253	2254	2255	2256	2257	2258	2259	2260	2261	2262	2263	2264	2265	2266	2267	2268	2269	2270	2271	2272	2273	2274	2275	2276	2277	2278	2279	2280	2281	2282	2283	2284	2285	2286	2287	2288	2289	2290	2291	2292	2293	2294	2295	2296	2297	2298	2299	2300	2301	2302	2303	2304	2305	2306	2307	2308	2309	2310	2311	2312	2313	2314	2315	2316	2317	2318	2319	2320	2321	2322	2323	2324	2325	2326	2327	2328	2329	2330	2331	2332	2333	2334	2335	2336	2337	2338	2339	2340	2341	2342	2343	2344	2345	2346	2347	2348	2349	2350	2351	2352	2353	2354	2355	2356	2357	2358	2359	2360	2361	2362	2363	2364	2365	2366	2367	2368	2369	2370	2371	2372	2373	2374	2375	2376	2377	2378	2379	2380	2381	2382	2383	2384	2385	2386	2387	2388	2389	2390	2391	2392	2393	2394	2395	2396	2397	2398	2399	2400	240
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31 Function table 56 has been defined to provide the distribution of maintenance actions at the PMI conditional upon detection of maintenance at the PMI.

32 Function table 57 has been defined to identify the relative probability of maintenance by subsystem at the PMI.

33 Fullword save value 191 (X191) provides generality with respect to platoon size.

33

INITIAL	44(4,2),0	UNACCRUITABLE MURDER-ON IMPACT	00193700
INITIAL	44(4,3),0	MULTIPLY-OUT SMR UP IN	00193900
INITIAL	44(4,4),0	OUTPUT 20127R	00193900
INITIAL	44(4,7),0	UNACCRUITABLE P-M MURDER	00194000
INITIAL	44(4,1),0		00194100
INITIAL	44(4,10),1	NUMBER OF MURDERERS ALLOWED	00194200
INITIAL	44(1,1),90	1ST 941PT 3-1941PT-10THS	00194300
INITIAL	44(2,1),90	2ND 941PT 3-1941PT-10THS	00194400
INITIAL	44(1,4),60	START 194 941PT OFFGET -10THS	00194500
INITIAL	44(1,16),4	A/C 222 COMPANY	00194600
INITIAL	44(1,4),1	LAUNCH # 1 MISSION TYPE-1ST PRIORITV00194700	
INITIAL	44(2,5),1	LAUNCH # 2 MISSION TYPE-1ST PRIORITV00194800	
INITIAL	44(3,5),1	LAUNCH # 3 MISSION TYPE-1ST PRIORITV00194900	
INITIAL	44(4,5),1	LAUNCH # 4 MISSION TYPE-1ST PRIORITV00195000	
INITIAL	44(5,5),1	LAUNCH # 5 MISSION TYPE-1ST PRIORITV00195100	
INITIAL	44(6,5),1	LAUNCH # 6 MISSION TYPE-1ST PRIORITV00195200	
INITIAL	44(7,5),1	LAUNCH # 7 MISSION TYPE-1ST PRIORITV00195300	
INITIAL	44(8,5),1	LAUNCH # 8 MISSION TYPE-1ST PRIORITV00195400	
INITIAL	44(9,5),1	LAUNCH # 9 MISSION TYPE-1ST PRIORITV00195500	
INITIAL	44(1,10),3	LAUNCH # 1 NUMBER A/C -1ST PRIORITV00195600	
INITIAL	44(2,10),3	LAUNCH # 2 NUMBER A/C -1ST PRIORITV00195700	
INITIAL	44(3,10),3	LAUNCH # 3 NUMBER A/C -1ST PRIORITV00195800	
INITIAL	44(4,10),3	LAUNCH # 4 NUMBER A/C -1ST PRIORITV00195900	
INITIAL	44(5,10),3	LAUNCH # 5 NUMBER A/C -1ST PRIORITV00196000	
INITIAL	44(6,10),3	LAUNCH # 6 NUMBER A/C -1ST PRIORITV00196100	
INITIAL	44(7,10),3	LAUNCH # 7 NUMBER A/C -1ST PRIORITV00196200	
INITIAL	44(8,10),3	LAUNCH # 8 NUMBER A/C -1ST PRIORITV00196300	
INITIAL	44(9,10),3	LAUNCH # 9 NUMBER A/C -1ST PRIORITV00196400	
INITIAL	44(1,11),70	TIME TO 2224 1ST LAUNCH PREP.	00196500
		NUMBER OF BLOCK UNITS.	00196600
INITIAL	44(2,11),15	TIME BETWEEN THIS LAUNCH & PREVIOUS	00196700
INITIAL	44(3,11),15	TIME BETWEEN THIS LAUNCH & PREVIOUS	00196800
INITIAL	44(4,11),15	TIME BETWEEN THIS LAUNCH & PREVIOUS	00196900
INITIAL	44(5,11),15	TIME BETWEEN THIS LAUNCH & PREVIOUS	00197000
INITIAL	44(6,11),15	TIME BETWEEN THIS LAUNCH & PREVIOUS	00197100
INITIAL	44(7,11),15	TIME BETWEEN THIS LAUNCH & PREVIOUS	00197200
INITIAL	44(8,11),15	TIME BETWEEN THIS LAUNCH & PREVIOUS	00197300
INITIAL	44(9,11),15	TIME BETWEEN THIS LAUNCH & PREVIOUS	00197400
INITIAL	44(1,12),9	NUMBER OF LAUNCHES PER DAY	00197500
INITIAL	44(2,12),0	PLACE TIME MISSION TYPE 1 (10THS)	00197600
INITIAL	44(3,12),0	TOTAL TIME FROM CALL TO LAUNCH-10THS	00197700
INITIAL	44(4,13),0	END TIME FROM 1941PT-10THS	00197800
INITIAL	44(5,13),0	LAUNCH TIME TO REPLACE ABORTS-10THS	00197900
INITIAL	44(1,17),999	PERCENT IN-FLY AFTER REPLACES/1000	00198000
INITIAL	44(1,15),1	4-274733 A/C BY 4-1941PT TYPE	00198100
INITIAL	44(1,19),7	FLY 2224 2224 FOR 2224 REPLACEMENTS	00198200
INITIAL	44(1,19),2	4-274733 A/C BY 4-1941PT TYPE	00198300
INITIAL	44(1,21),5	TIME LAUNCH 2224 STAYS OPEN	00198400
INITIAL	44(26,1),2403	2ND INTERVAL IN 4-274733 # 1	00198500
INITIAL	44(26,2),1903	2ND INTERVAL IN 4-274733 # 2	00198600
INITIAL	44(26,3),2403	2ND INTERVAL IN 4-274733 # 3	00198700

INVTZAL	446(26,4),1200	T97 INVTZVAL	IN 489-TZEM # 4	01159400
INVTZAL	446(26,5),1200	T87 INVTZVAL	IN 489-TZEM # 5	01159500
INVTZAL	446(26,6),1200	T87 INVTZVAL	IN 489-TZEM # 6	01159600
INVTZAL	446(26,7),1200	T87 INVTZVAL	IN 489-TZEM # 7	01159700
INVTZAL	446(26,8),1200	T87 INVTZVAL	IN 489-TZEM # 8	01159800
INVTZAL	446(26,9),2400	T87 INVTZVAL	IN 489-TZEM # 9	01159900
INVTZAL	446(26,10),2400	T87 INVTZVAL	IN 489-TZEM # 10	01160000
INVTZAL	446(26,11),1200	T87 INVTZVAL	IN 489-TZEM # 11	01160100
INVTZAL	446(26,12),1200	T87 INVTZVAL	IN 489-TZEM # 12	01160200
INVTZAL	446(26,13),1200	T87 INVTZVAL	IN 489-TZEM # 13	01160300
INVTZAL	446(26,14),1200	T87 INVTZVAL	IN 489-TZEM # 14	01160400
INVTZAL	446(26,15),300	T87 INVTZVAL	IN 489-TZEM # 15	01160500
INVTZAL	446(26,16),300	T87 INVTZVAL	IN 489-TZEM # 16	01160600
INVTZAL	446(26,17),300000	T87 INVTZVAL	IN 489-TZEM # 17	01160700
INVTZAL	446(26,18),300000	T87 INVTZVAL	IN 489-TZEM # 18	01160800
INVTZAL	446(27,1),0317	T87 INVTZVAL	IN 489-TZEM # 1	01160900
INVTZAL	446(27,2),0323	T87 INVTZVAL	IN 489-TZEM # 2	01161000
INVTZAL	446(27,3),0323	T87 INVTZVAL	IN 489-TZEM # 3	01161100
INVTZAL	446(27,4),0333	T87 INVTZVAL	IN 489-TZEM # 4	01161200
INVTZAL	446(27,5),0333	T87 INVTZVAL	IN 489-TZEM # 5	01161300
INVTZAL	446(27,6),0337	T87 INVTZVAL	IN 489-TZEM # 6	01161400
INVTZAL	446(27,7),0333	T87 INVTZVAL	IN 489-TZEM # 7	01161500
INVTZAL	446(27,8),0341	T87 INVTZVAL	IN 489-TZEM # 8	01161600
INVTZAL	446(27,9),0343	T87 INVTZVAL	IN 489-TZEM # 9	01161700
INVTZAL	446(27,10),0357	T87 INVTZVAL	IN 489-TZEM # 10	01161800
INVTZAL	446(27,11),0331	T87 INVTZVAL	IN 489-TZEM # 11	01161900
INVTZAL	446(27,12),0332	T87 INVTZVAL	IN 489-TZEM # 12	01162000
INVTZAL	446(27,13),0336	T87 INVTZVAL	IN 489-TZEM # 13	01162100
INVTZAL	446(27,14),0330	T87 INVTZVAL	IN 489-TZEM # 14	01162200
INVTZAL	446(27,15),1127	T87 INVTZVAL	IN 489-TZEM # 15	01162300
INVTZAL	446(27,16),1131	T87 INVTZVAL	IN 489-TZEM # 16	01162400
INVTZAL	446(27,17),1134	T87 INVTZVAL	IN 489-TZEM # 17	01162500
INVTZAL	446(27,18),1134	T87 INVTZVAL	IN 489-TZEM # 18	01162600
INVTZAL	441(4,17),1600	FLYING INVTZVAL		01162700
INVTZAL	443(4,2),1600	FLYING INVTZVAL		01162800
INVTZAL	443(4,3),40	FLYING INVTZVAL		01162900
INVTZAL	443(4,4),60	FLYING INVTZVAL		01163000
INVTZAL	443(4,5),1	FLYING INVTZVAL		01163100
INVTZAL	443(4,6),58	FLYING INVTZVAL		01163200
INVTZAL	441(2,12),50	FLYING INVTZVAL		01163300
INVTZAL	446(29,1),6	FLYING INVTZVAL		01163400
INVTZAL	446(29,2),6	FLYING INVTZVAL		01163500
INVTZAL	446(29,3),6	FLYING INVTZVAL		01163600
INVTZAL	446(29,4),6	FLYING INVTZVAL		01163700
INVTZAL	446(29,5),6	FLYING INVTZVAL		01163800
INVTZAL	446(29,6),6	FLYING INVTZVAL		01163900
INVTZAL	446(29,7),6	FLYING INVTZVAL		01164000
INVTZAL	446(29,8),6	FLYING INVTZVAL		01164100
INVTZAL	446(29,9),6	FLYING INVTZVAL		01164200
INVTZAL	446(29,10),6	FLYING INVTZVAL		01164300

34 Fullword save value 189 has been established to identify the PMP interval in tenths of hours.

35 Fullword save value 193 identifies the number of "week end" nonworking hours per week in tenths of hours.

36 Fullword save value 194 identifies the number of aircraft required for the first mission of the next day. It is employed to determine whether or not maintenance personnel should be required for overtime maintenance at the end of the day. If this save value is not defined, no overtime will take place.

37 Fullword save value 190 has been identified to establish the PMI interval in tenths of hours.

38 Fullword save value 192 identifies the number of working days per week.

39 Fullword save value 195 identifies the number of days between calendar inspections. If no calendar inspections are to be performed, input a dummy value of 30,000.

40 Fullword save value 196 identifies the window for calendar PMP activation. If no calendar inspection is desired, input a dummy value of zero.

41 Fullword save value 197 contains the number of TBO components per aircraft. It must be a number less than 25.

[illegible]

	899130	20,41	01140700
	899130	5,01	01140800
	90011	1,844,25	01140900
	90011	246,23,4	01141000
9454	899130	15,4,6,7,20,15,1	01141100
	899130	15,4,6,9,24,15,1	01141200
9454	90011	1,2,4,1,11,22,947	01141300
	899130	5,947	01141400
9453	899130	10,41	01141500
9453	899130	21,46,945	01141600
	899130	21,47,945	01141700
	899130	7	01141800
	899130	11,1	01141900
	899130	2,441(3,12)	01142000
9454	899130	1	01142100
	899130	227,24,947	01142200
	899130	2,63-37,1,,4243	01142300
	899130	1,63-20,,40	01142400
	899130	50,41	01142500
89433	899130	550,23,4	01142600
	899130	1,945	01142700
9454	899130	2,441	01142800
	899130	1,441	01142900
9453	899130	1,41	01143000
	899130	2,441(62,12)	01143100
	899130	1,945	01143200
9453	899130	441(3,12)	01143300
	899130	1,945	01143400
	899130	1,945	01143500
	899130	1,945	01143600
	899130	1,945	01143700
	899130	1,945	01143800
	899130	1,945	01143900
	899130	1,945	01144000
	899130	1,945	01144100
	899130	1,945	01144200
	899130	1,945	01144300
	899130	1,945	01144400
	899130	1,945	01144500
	899130	1,945	01144600
	899130	1,945	01144700
	899130	1,945	01144800
	899130	1,945	01144900
	899130	1,945	01145000
	899130	1,945	01145100
	899130	1,945	01145200
	899130	1,945	01145300
	899130	1,945	01145400
	899130	1,945	01145500
	899130	1,945	01145600
	899130	1,945	01145700
	899130	1,945	01145800
	899130	1,945	01145900
	899130	1,945	01146000
	899130	1,945	01146100
	899130	1,945	01146200
	899130	1,945	01146300
	899130	1,945	01146400
	899130	1,945	01146500
	899130	1,945	01146600
	899130	1,945	01146700
	899130	1,945	01146800
	899130	1,945	01146900
	899130	1,945	01147000
	899130	1,945	01147100
	899130	1,945	01147200
	899130	1,945	01147300
	899130	1,945	01147400
	899130	1,945	01147500
	899130	1,945	01147600
	899130	1,945	01147700
	899130	1,945	01147800
	899130	1,945	01147900
	899130	1,945	01148000
	899130	1,945	01148100
	899130	1,945	01148200
	899130	1,945	01148300
	899130	1,945	01148400
	899130	1,945	01148500
	899130	1,945	01148600
	899130	1,945	01148700
	899130	1,945	01148800
	899130	1,945	01148900
	899130	1,945	01149000
	899130	1,945	01149100
	899130	1,945	01149200
	899130	1,945	01149300
	899130	1,945	01149400
	899130	1,945	01149500
	899130	1,945	01149600
	899130	1,945	01149700
	899130	1,945	01149800
	899130	1,945	01149900
	899130	1,945	01150000
	899130	1,945	01150100
	899130	1,945	01150200
	899130	1,945	01150300
	899130	1,945	01150400
	899130	1,945	01150500
	899130	1,945	01150600
	899130	1,945	01150700
	899130	1,945	01150800
	899130	1,945	01150900
	899130	1,945	01151000
	899130	1,945	01151100
	899130	1,945	01151200
	899130	1,945	01151300
	899130	1,945	01151400
	899130	1,945	01151500
	899130	1,945	01151600
	899130	1,945	01151700
	899130	1,945	01151800
	899130	1,945	01151900
	899130	1,945	01152000
	899130	1,945	01152100
	899130	1,945	01152200
	899130	1,945	01152300
	899130	1,945	01152400
	899130	1,945	01152500
	899130	1,945	01152600
	899130	1,945	01152700
	899130	1,945	01152800
	899130	1,945	01152900
	899130	1,945	01153000
	899130	1,945	01153100
	899130	1,945	01153200
	899130	1,945	01153300
	899130	1,945	01153400
	899130	1,945	01153500
	899130	1,945	01153600
	899130	1,945	01153700
	899130	1,945	01153800
	899130	1,945	01153900
	899130	1,945	01154000
	899130	1,945	01154100
	899130	1,945	01154200
	899130	1,945	01154300
	899130	1,945	01154400
	899130	1,945	01154500
	899130	1,945	01154600
	899130	1,945	01154700
	899130	1,945	01154800
	899130	1,945	01154900
	899130	1,945	01155000
	899130	1,945	01155100
	899130	1,945	01155200
	899130	1,945	01155300
	899130	1,945	01155400
	899130	1,945	01155500
	899130	1,945	01155600
	899130	1,945	01155700
	899130	1,945	01155800
	899130	1,945	01155900
	899130	1,945	01156000
	899130	1,945	01156100
	899130	1,945	01156200
	899130	1,945	01156300
	899130	1,945	01156400
	899130	1,945	01156500
	899130	1,945	01156600
	899130	1,945	01156700
	899130	1,945	01156800
	899130	1,945	01156900
	899130	1,945	01157000
	899130	1,945	01157100
	899130	1,945	01157200
	899130	1,945	01157300
	899130	1,945	01157400
	899130	1,945	01157500
	899130	1,945	01157600
	899130	1,945	01157700
	899130	1,945	01157800
	899130	1,945	01157900
	899130	1,945	01158000
	899130	1,945	01158100
	899130	1,945	01158200
	899130	1,945	01158300
	899130	1,945	01158400
	899130	1,945	01158500
	899130	1,945	01158600
	899130	1,945	01158700
	899130	1,945	01158800
	899130	1,945	01158900
	899130	1,945	01159000
	899130	1,945	01159100
	899130	1,945	01159200
	899130	1,945	01159300
	899130	1,945	01159400
	899130	1,945	01159500
	899130	1,945	01159600
	899130	1,945	01159700
	899130	1,945	01159800
	899130	1,945	01159900
	899130	1,945	01160000

	ADVANCE:	P6	00174100
	JNLENK	2,8480,1	00174200
	JNLENK	2,PTJ,1,,,PTE	00174300
	TRANSFER	,PTJ	00174400
PTK	LOGICR	1	00174500
PTB	ADVANCE:	P3	00174600
	TRANSFER	,PTC	00174700
PTP	LENK	2,PTPO	00174800
PTD	TRANSFER	,PTP	00174900
PTM	ASSIGN	1,4X1(8,6)	00175000
	TEST GE	P1,40,8480	00175100
	SPLIT	1,PTQ,,25	00175200
PTJ	TEST GE	411,P1,PTK	00175300
	LOGICR	2	00175400
	LOGICR	1	00175500
	TERMINATE		00175600
PTN	ADVANCE:	20	00175700
	TRANSFER	,PTJ	00175800
PTQ	SPLIT	1,PTL,25	00175900
	SPLIT	1,PTT,,25	00176000
	SPLIT	4,PTX,11,25	00176100
PTX	ASSIGN	9,441(V2,10)	00176200
	TEST GE	P0,41,8480	00176300
	ASSIGN	1,V3	00176400
	ASSIGN	6,441(V2,17)	00176500
	LOGICR	V7	00176600
	ADVANCE:	441(V2,16)	00176700
PTZ	LOGICR	V7	00176800
	ADVANCE:	P6	00176900
	LOGICR	V7	00177000
	ADVANCE:	P0	00177100
	DATE LR	P1,8480	00177200
	TRANSFER	,PTZ	00177300
PTL	SPLIT	4,PTP,11,25	00177400
PTP	ASSIGN	9,441(V2,14)	00177500
	TEST GE	P0,41,8480	00177600
	ASSIGN	1,V3	00177700
	ASSIGN	8,V4	00177800
PTN	TEST GE	4480,P0,PTM	00177900
	LOGICR	V7	00178000
	LOGICR	01	00178100
	TERMINATE		00178200
PTM	ADVANCE:	10	00178300
	TRANSFER	,PTN	00178400
PTT	SPLIT	4,PTJ,11,25	00178500
PTB	ASSIGN	9,441(V2,15)	00178600
	TEST GE	P0,41,8480	00178700
	LOGICR	V7	00178800
	ADVANCE:	P0	00178900
	LOGICR	V7	00179000
	TERMINATE		00179100

J374 37
 A99134 17.9
 SAVEVALUE V155+.41
 SAVEVALUE V156+.41
 SAVEVALUE 400+.41
 SAVEVALUE 1000+.41
 TRANSFER .44433

STANDARD AIRCRAFT SUBJECTIVE

9AC4 A99134 70
 A99134 4.40
 9AC3 A99134 4.9AC3, 4.25
 A99134 3.441(44,15)
 9AC3 A99134 19.9433
 TEST 02 23.41, 9463
 9AC3 EXECUTE 9434
 A99134 2.38
 9AC4 ALTER 16.44, 9.44, 15.1
 9AC4 A99134 1.9433
 TEST 2 403.41, 9463
 9AC4 JNLIN 1.244, 1.1, 9463
 L370 3.9463
 TERMINATE
 9AC3 A99134 1.41
 TEST 02 21.44, 9463
 A99134 3.32
 A99134 1.40
 ADVANCE 1
 TRANSFER .9463
 9AC4 A99134 4.441
 TRANSFER .9463
 9AC4 A99134 4.44
 EXECUTE 32
 A99134 1.40
 A99134 3.1
 TRANSFER .9463
 9AC4 A99134 9.41
 TRANSFER .9463

AIRCRAFT MAINLINE SUBJECTIVE

PRELIMINARY L370

9AC4 A99134 16.1
 9AC3 A99134 15.2
 TEST 2 215.40, 44441

01144300
 01144400
 01144500
 01144600
 01144700
 01144800
 01144900
 01145000
 01145100
 01145200
 01145300
 01145400
 01145500
 01145600
 01145700
 01145800
 01145900
 01146000
 01146100
 01146200
 01146300
 01146400
 01146500
 01146600
 01146700
 01146800
 01146900
 01147000
 01147100
 01147200
 01147300
 01147400
 01147500
 01147600
 01147700
 01147800
 01147900
 01148000
 01148100
 01148200
 01148300
 01148400
 01148500
 01148600
 01148700
 01148800
 01148900
 01149000
 01149100
 01149200
 01149300

42 Card 1805 (ZZB) has been generalized with respect to platoon size by the use of save value 191 in place of a constant in the logic.

43 Card 1809 has been modified to assign a random number of hours which is calculated through variable 231 to parameter 40, that is, the initial hours on the aircraft. Variable 231 generates a 6-digit random number which is then taken modulo save value 189 which is the input value of the PMP interval. Thus, this assign statement generates values for parameter 40 which are dependent only upon an input parameter, namely value 189, rather than logically dependent upon a constant, as was the case of the original UH-1 model when this assign statement generated values for parameter 40 as a function of random number generator 1. Thus the original UH-1 logic always generated initial airframe hours in the interval 0 to 99 hours.

44 Card 181010 has been added to assign a random number of hours since last daily inspection to each aircraft through variable 237.

45 Card 1816 has been modified, due to the increase in model size, to facilitate a 24 aircraft platoon.

46 Card 1818 has been modified to accommodate a platoon size of 24 aircraft.

47 Cards 1824 to 1828 have been modified to ensure against certain rather obscure situations; aircraft could be subjected to extra erroneous PMI inspections which originally could arise in the Government-furnished UH-1 model. Modifications to the logic shown in these blocks insure that this situation will not occur. The logic has been changed by testing parameter 35 for a flag to determine whether or not the aircraft has just received an intermediate or a periodic inspection and therefore, has its parameter 35 value flagged at 999. Also, cards 1825 and 1826 have been generalized to be functionally dependent upon variables 234 and 235, rather than logically dependent upon constants as was the original case in the UH-1 model. Furthermore, the tests in cards 1825 and 1826 have been changed from a test less than or equal to, as was the case in the previous or original model, to a test less than. Again, it is felt that in certain obscure instances, the logic of the original model could allow aircraft to slip through this test and not undergo PMI or PMP inspections when really required. It should be noted here, however, that any of the modifications in this area of PMI, PMP interaction generalization were irrelevant to the original UH-1 model. This is because the original model required that all aircraft receiving PMP or PMI inspection would go through a test hop. In the case of the CH-47C and HLH, it is felt that an intermediate inspection would not require a test hop. Thus, this eventuality arose where PMP inspections could be erroneously duplicated.

48 Cards 1829 and 182910 have been added to check flying aircraft to see if they need a daily through Boolean variable 20.

4LW2	JJTN	20	THIS LOGIC IS VALID FOR	00102700
	ASSIGN	35,40	ALL RJNS TO STOP EXTRA PINT'S	00102800
4AD	TEST W2	SV20,1,DLB	FLYING AC. GET CHECK FOR DAIL'	00102900
	LEAK	1,PTPD		00102910
4AB	TEST W2	P16,42,4AP		00103000
	ASSIGN	16,40		00103100
4AP	SECURITY	00		00103200
	TRANSFER	,AAC		00103300
ARM17	ASSIGN	15,40		00103400
	JJTN	30		00103500
	ASSIGN	17,17		00103600
	SAVEVALUE	V169+,K1		00103700
	SAVEVALUE	V170+,K1		00103800
	SAVEVALUE	050+,K1		00103900
	SAVEVALUE	1050+,K1		00104000
	TRANSFER	,ARM19		00104100
ARM19	ASSIGN	15,40		00104200

	SAVEVALUE	V1516.41	01199800
	SAVEVALUE	2258.41	01199500
	SAVEVALUE	V1526.41	01199600
	SAVEVALUE	9256.41	01199700
19481	RENDVE	28	01199800
	JCTN	29	01199900
P_MT	ASSIGN	19.41	01100000
	ASSIGN	17.441(40,16)	01100100
	TEST VE	09.011,PL40	01100200
	ASSIGN	9.41	01100300
P_M3	ASSIGN	1.441(40,22)	01100400
P_MX	TEST E	017.41,PL4C	01100500
	TRANSFER	.01,PL44,PL4C	01100600
P_MC	TRANSFER	999.114.5	01100700
	TEST LE	V13.042,PL44	01100800
P_M4	LEAVE	17.044	01100900
P_M4	ASSIGN	17.5	01101000
	ENTER	1	01101100
	ADVANCE	441(4,13)	01101200
	TABLEATE	3	01101300
	TEST LE	V13.042,PL4L	01101400
P_MJ	TEST VE	015.41,PL4D	01101500
P_MP	ENTER	2	01101600
	STATE LS	V14	01101700
P_M2	RENDVE	29	01101800
	MARK		01101900
	JULINK	3.79744.4LL,12,212	01102000
	LEAVE	2	01102100
	STATE LS	V13.044	01102200
	TRANSFER	.PL74	01102300
P_M4	LEAVE	1	01102400
	TRANSFER	.443	01102500
P_M4	ASSIGN	19.017	01102600
	RENDVE	29	01102700
	ASSIGN	19.044	01102800
	TRANSFER	.C44	01102900
P_ML	ASSIGN	19.017	01103000
	RENDVE	29	01103100
	ASSIGN	19.044	01103200
	TRANSFER	.C44	01103300
P_M3	JCTN	27	01103400
	RENDVE	29	01103500
	ASSIGN	15.457	01103600
	LINK	2.017	01103700
P_M2	RENDVE	27	01103800
	ASSIGN	15.42	01103900
	SPLIT	1.54C4,60	01104000
	JCTN	29	01104100
	TRANSFER	.PL40	01104200
P_M4	JCTN	29	01104300
	TRANSFER	.PL44	01104400

49 Cards 1973 through 1976 have been modified to tabulate flight time based upon input parameters in function 4 rather than based upon constants in the logic, as was the original case of the UH-1 model.

50 Card 1977 is a modification in the original logic of the model which accounts for airframe hours of the aircraft. This logic change is necessary to ensure that the total number of aborted test hop and mission flight hours are accounted for within the model.

51 Card 1994 has been modified due to the change in save value numbers generated by modifying the model to accommodate 24 aircraft.

52 Cards 1995 through 2002 have been modified similar to the previous set of blocks to ensure that flight hour accountability is functionally dependent upon input function 4, rather than logically dependent upon constants equal to the mission length as in the UH-1 model. Furthermore, modifications were made to card 2001 to ensure proper accounting of all test hop hours on parameter 40 for each aircraft.

- 52 Cards were modified to generalize flight hour accounting.
- 53 Card 200910 was added to flag aircraft that have flown, with a negative 720 in parameter 46.
- 54 Cards 2011 through 2016 have been added to the original logic to the UH-1 model to ensure that an aircraft which has just received a test hop and has aborted this test hop is routed properly and does not go into the PMI or PMP routine again.
- 55 Cards 2018 and 2019 have been modified to make sure that the flight hour accounting on aborted flights is functionally dependent upon input function table 4 rather than dependent upon a constant specifying the aborted mission length. Variable 18 takes the value for the mission length input through function table 4 and divides it by 2. An aborted flight will, therefore, take one half of the function 4 value rather than just having a constant built into the logic.
- 56 Cards 2020 and 2021 have been modified due to the change in save value number generated by increasing the model size to 24 aircraft.
- 57 Cards 2022 through 2025 have been modified to generalize accounting of aborted flight hours.
- 58 Cards 2026 to 2031 have been modified to generalize the model tests for PMP and PMI aircraft.
- 59 Card 203410 was added to flag aircraft that have flown, with a negative 720 in parameter 46.

52	SAVEVALUE	9000,P48	TEST FOR FLIGHT HOURS	01100000
	SAVEVALUE	V2000,K1		00100700
	SAVEVALUE	13750,K1		01100000
	SAVEVALUE	V2000,P48	THIS CHANGE IS GOOD FOR ALL	01100000
52	SAVEVALUE	10000,P48	SUBSEQUENT RUNS	01200000
	ASSIGN	800,P48	ACCOUNT FOR TEST HOURS ON P40	00200100
	TRANSFER	,PLT4		01200200
PLTC	TEST LE	V13,P45,PLTJ		00200300
	ASSIGN	13,6		01200400
	TRANSFER	,PLTJ		00200500
PLRJ	ASSIGN	19,7		01200600
	TRANSFER	,900,PLTF,PLT2		01200700
PLRF	JULINE	8,PLTB,1,8,P8		01200800
PLRE	ADVANCE	V19		00200900
53	ASSIGN	86,V237		01200910
			FOLLOWING CHANGE GOOD FOR ALL RUNS	00201000
	TEST Q	P9,40,4LM3	ROUTE ADJUSTED TEST HOURS	01201100
	TEST L	V107,V234,MLM21	GENERAL-ACCOUNTING INSURFS	00201200
	TEST L	V11,V236,4LM21	TEST FOR CALENDAR PHP	01201210
	TEST L	V140,V235,MLM21	AGAINST JUNE AN	00201300
54	TRANSFER	,4LM22	EXTRA PHP ON AN	01201400
	ASSIGN	35,900	ADJUSTED AFTER A	00201500
	SAVEVALUE	V2000,K1	PHP, GOOD FOR ALL RUNS.	01201600
	SAVEVALUE	V2000,K1		01201700
55	SAVEVALUE	V2100,V10	GENERALIZE ACCOUNTING OF	01201800
	SAVEVALUE	V2110,V10	ABORTED FLIGHT TIME	00201900
56	SAVEVALUE	10500,K1		00202000
	SAVEVALUE	15000,K1	CHANGES ARE GOOD FOR	00202100
	SAVEVALUE	10750,V10	ALL SUBSEQUENT RUNS	00202200
57	SAVEVALUE	13000,V10	ALL SUBSEQUENT RUNS	01202300
	ASSIGN	800,V19	ACCOUNT FOR ABORTED HRS ON A/C	01202400
	TRANSFER	,PLT4	CHANGES GOOD FOR ALL RUNS	00202500
	SAVEVALUE	1050,K1	ON ABORTED TEST HOURS	01202600
58	ASSIGN	800,V19	GENERALIZE	01202700
	TEST L	V107,V234,MLM3	ACCOUNTING	01202800
	TEST L	V11,V236,4LM3	TEST FOR CALENDAR PHP	00202910
	TEST L	V140,V235,4LM3	ON ADJUSTED	01202900
	TRANSFER	,PLT4	TEST HOURS	00203000
	ASSIGN	35,4000		01203100
	TRANSFER	,PLT4		01203200
PLTB	SPLOT	1,8AC4,.60		00203300
	ADVANCE	441(7,13)		01203400
59	ASSIGN	86,V237		01203410
	ASSIGN	800,441(7,13)		00203500
	4000			00203600
	ASSIGN	90,K6		00203700
	TRANSFER	,PLTB		00203800
TEST40	ASSIGN	9,40		01203900
	DATE LE	1,449		01204000
	JUNE	30		00204100
	4000	6		00204200
	ENTER	1		00204300
	DATE L9	10		00204400
	SPLOT	1,75249,.60		01204500
	LENA	3,PTCJ		01204600

60 Card 2092 has been generalized by using a save value in the shift control logic rather than a constant.

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64-472

61 Card 2100 has been generalized by using a save value in the shift control logic rather than a constant.

62 Card 210201 has no impact on the present model.

63 Cards 2111 and 211110 have been added for the daily inspection test. Mark 46 puts the present time in parameter 46 of the aircraft currently at this spot.

64 This change to Card 211510 is necessary for proper activation of the daily routine.

65 Cards 2122 and 2123 have been added to ensure that an aircraft that is in the daily routine and has just previously come from an intermediate inspection will not erroneously go back to the intermediate inspection routine.

FLIGHT	TIME	ACTIVITY	TIME	ACTIVITY	TIME	ACTIVITY
51	01:00	ASSIGN ADVANCE	14.40	00209900		
	01:05	LOG	02	00209900		
	01:10	LOG	3,0LCS	00209901		
	01:15	ADVANCE	X103	00210000		
	01:20	34 THIS CARD FOR OTHER THAN A 7 5 V WEEK USE ADVANCE 480		00210100		
52	01:25	TRANSFER	.AR416	00210201		
	01:30	SUPPER		00210300		
	01:35	TRANSFER	.0LCS	00210400		
	01:40	ASSIGN	10,41	00210500		
	01:45	TEST 2	V21,40,0LCS	00210600		
	01:50	TRANSFER	.0LCS	00210700		
	01:55	ASSIGN	16.40	00210800		
	02:00	REMOVE	27	00210900		
	02:05	LEAVE	1	00211000		
	02:10	ASSIGN	10,40	00211100		
53	02:15	TEST 02	V230,720,0LCS	00211110		
	02:20	ARR	46	00211120		
	02:25	ASSIGN	17,16	00211200		
	02:30	REMOVE	20	00211300		
	02:35	ASSIGN	16,40	00211400		
	02:40	ASSIGN	13,2	00211500		
54	02:45	TRANSFER	.0LM	00211510		
	02:50	LEAVE	1,PTD	00211600		
	02:55	ASSIGN	17,416	00211700		
	03:00	TEST 12	P24,4X1(4,10),RLARA	00211800		
	03:05	JOIN	33	00211900		
	03:10	TRANSFER	339,LEA,3	00212000		
	03:15	ADVANCE	40	00212100		
	03:20	REMOVE	33	00212200		
55	03:25	TEST 02	V140,V235,0LC	00212300		
	03:30	ASSIGN	35,999	00212400		
	03:35	TEST 3	V13,P42,AAB	00212500		
	03:40	ASSIGN	19,017	00212600		
	03:45	ASSIGN	19,9AAB	00212700		
	03:50	TRANSFER	.CMA	00212800		
	03:55			00212900		
	04:00			00213000		
	04:05			00213100		
	04:10			00213200		
	04:15			00213300		
	04:20			00213400		
	04:25			00213500		
	04:30			00213600		
	04:35			00213700		
	04:40			00213800		
	04:45			00213900		
	04:50			00214000		
	04:55			00214100		
	05:00			00214200		
	05:05			00214300		
	05:10			00214400		
	05:15			00214500		
	05:20			00214600		
	05:25			00214700		
	05:30			00214800		
	05:35					
	05:40					
	05:45					
	05:50					
	05:55					
	06:00					
	06:05					
	06:10					
	06:15					
	06:20					
	06:25					
	06:30					

66 Card 2199 has been modified to generalize the model with respect to the number of TBO components per aircraft through use of save value 197 rather than a constant in the logic.

67 Card 2200 has been generalized by use of save value 189, rather than a constant in the program logic.

68 Card 220010 has been added to zero out aircraft time since last calendar PMP.

69 Cards 2226 through 2236 have been modified or added to the original UH-1 logic to allow for the detection of failures at the intermediate inspection and to do away with test hops after the intermediate inspection. This logic is consistent with the baseline HLH and CH-47 maintenance concept. The maintenance concepts for the UH-1 model used in the baseline Government model did not provide for the detection of maintenance at the intermediate inspection.

57	AR422	TEST 8	V143,X189,AR428 GENERAL	01220000
58	AR421	ASSIGN	37,0	01220010
	04CY	LOTP	ZERO OUT TIME SINCE LAST CALENDAR INSP.	01220100
	04CY	ADVANCE	12,AR422	01220200
	AR428	PRICRITY	20,81PPER	01220300
		MARK		01220400
		ASSIGN	35,909	01220500
		ASSIGN	26,40	01220600
		ASSIGN	15,2	01220700
		ASSIGN	2',904CM	01220800
		ASSIGN	23,P47	01220900
		ASSIGN	2,40	01221000
		SPLIT	1,04CP,,60	01221100
		2J7UE	P17	01221200
		ENTER	V26	01221300
		DEPART	P17	01221400
		SPLIT	1,04C0,,60	01221500
		SPLIT	1,04CR,,60	01221600
	04CH	ASSIGNBLE	13	01221700
		PRICRITY	00	01221800
		LEAVE	V26	01221900
		TABULATE	3	01222000
		RECODE	30	01222100
		RECODE	37	01222200
		TEST ME	P17,417,P4CZ	01222300
		TEST E	P17,40,AR433	01222400
	AR433	SPLIT	1,REPO	01222500
		TEST LE	V13,P42,4LM1	01222600
59		ASSIGN	27,41	01222700
		TEST E	P28,40,RLARA	01222800
		TRANSFER	,449	01222900
	04CAA	TEST LE	V13,P42,P4CB	01223000
		TEST E	P28,40,P4CT	01223100
		TRANSFER	,449	01223200
	4LM1	ASSIGN	10,P17	01223300
59		ASSIGN	25,41	01223400
		ASSIGN	27,40	01223500
		TRANSFER	,C44	01223600
	04CZ	SPLIT	1,RE4A,,60	01223700
		TRANSFER	,P4C4A	01223800
	04CB	ASSIGN	10,P17	01223900
		ASSIGN	25,41	01224000
		ASSIGN	27,41	01224100
		TRANSFER	,C44	01224200
	04CT	ASSIGN	27,41	01224300
		TRANSFER	,RLARA	01224400
	04CP	LEAK	27,P7P3	01224500
	04CB	ADVANCE	4X1(1,V32)	01224600
		JULINK	27,9433,1,14,P14	01224700
		TRANSFER	,P4CM	01224800
	04CR	SPLIT	10,P4CU,2,60	01224900
	04CU	ASSIGN	3,4X1(V33,42)	01225000

PUT IN LOGIC TO
DETECT FAILURES AT
P4I AND TO GO AWAY WITH TEST HOPS
AFTER P4I,3700 FOR ALL RUNS

CHANGES TO ALLOW FOR
UNSCHEDULED MAINTENANCE
AT P4I AND TO GO AWAY WITH TEST
HOPS,3700 FOR ALL RUNS

	TEST GE	23, 41, 0404	00225100
	ASSIGN	0, 441 (V34, 02)	00225200
	TEST E	217, 49, 04030	00225300
	SAVEVALUE	V1570, V36	00225400
	SAVEVALUE	V1590, V36	00225500
	SAVEVALUE	0230, V35	00225600
	SAVEVALUE	10230, V34	00225700
040V	2J00E	V27	00225800
0404	DATE L2	27, 2401	00225900
	ASSIGN	7, V24	00226000
	ASSIGN	20, V35	00226100
	ASSIGN	9, 1	00226200
040K	TEST GE	207, 23, 0402L	00226300
040J	TEST LE	04, 220, 0404	00226400
040C	DEPART	V27	00226500
	ENTER	07, 23	00226600
	ADVANCE	04	00226700
	LEAVE	07, 04	00226800
	JNLY	07, JNLY, ALL	00226900
	SAVEVALUE	20, 22, 017, V35	00227000
	SAVEVALUE	V370, V35	00227100
	SAVEVALUE	320, V35	00227200
	TEST E	225, 40, 0400	00227300
	TRANSFER	, 2404	00227400
0403	TEST E	217, 417, 0404V	00227500
	SAVEVALUE	V1710, V36	00227600
	SAVEVALUE	V1720, V36	00227700
	SAVEVALUE	0750, V35	00227800
	SAVEVALUE	10750, V34	00227900
	TRANSFER	, 040V	00228000
040J	ASSIGN	7, V27	00228100
	ASSIGN	9, 40	00228200
	ASSIGN	20, V34	00228300
	TRANSFER	, 040C	00228400
0404	ASSIGN	22, V33	00228500
	ASSIGN	0, 029	00228600
	ASSIGN	24, 41	00228700
	TEST E	21, 41, 0403	00228800
	DEPART	V27	00228900
040D	ASSIGN	1, 222	00229000
	221721TY	1, 3JEFER	00229100
	221721TY	20	00229200
	ASSIGN	25, 41	00229300
	TRANSFER	, 040V	00229400
040L	LYN	27, 223	00229500
04020	SPUT	1, 02420	00229600
	TRANSFER	, 02421	00229700
0			00229800
0			00229900
0	TIME CHANGE OVERALL, RETIREMENT SUBROUTINE		00230000
0			00230100

70 Card 2302 has been modified due to the expansion of the model to accommodate 24 aircraft.

71 Card 2323 has been added to the original logic of the UH-1 baseline model. This block ensures that the values calculated in certain save values are proper. The original model was defined without this block. Whenever more than 10 maintenance actions were generated simultaneously, the accounting of these maintenance actions overflowed into save values which were used for other functions such as monitoring the engine changes, the maintenance actions determined at turnaround inspections, etc. It is felt that this block is extremely critical to the proper actuation of the model. Since not having this block in the model allows for erroneous tabulation of results, a great deal of effort can be expended to find out why the model is accounting for engine changes when the maintenance concept does not call for scheduled engine changes.

70-13429 ASSIGN 22,446(27,P12)
 SAVEVALUE 5,010,012,V15),4
 ASSIGN 12,1
 ASSIGN 6,3
 ASSIGN 25,4135
 ASSIGN 17,13
 SAVEVALUE 50,005,06,41,4
 SAVEVALUE V1750,41
 SAVEVALUE 5250,41
 SAVEVALUE V1760,41
 SAVEVALUE 11250,41
 T2449FE2 ,40A8

FAILURE DETERMINATION ROUTINE

71-13429 ASSIGN 2,PN3
 TABULATE 8
 TEST LE P2,410,POA NEEDED TO ENSURE PROPER SAVEVALUES
 WHEN GREATER THAN 10 HAS BEEN FOUND

POA SAVEVALUE V400,41,M
 ASSIGN 240,41
 ASSIGN 3,PN15
 TABULATE 5
 TABULATE 6
 SAVEVALUE V1730,41
 SAVEVALUE 5000,41
 SAVEVALUE V1740,41
 SAVEVALUE 11000,41
 SAVEVALUE V401,41,M
 ASSIGN 0,423
 SAVEVALUE 1,PN2
 ASSIGN 5,PN22
 SAVEVALUE 2,2,1,0,M
 POB ASSIGN 22,002
 TEST NE 05,41,ARM50
 SAVEVALUE 20,2,1,PN04,M
 ARM50 TEST LE 11,442(2,1),POD
 TABULATE 7
 SPLIT 1,PN4,00
 TEST E P10,47,PDL
 ASSIGN 10,6
 POB ASSIGN 25,41
 POB LOOP 2,POA
 TEST E 025,41,PO4
 TEST E 9V18,1,RLARA

01230200
 01230300
 01230400
 01230500
 01230600
 01230700
 01230800
 01230900
 01231000
 01231100
 01231200
 01231300
 01231400
 01231500
 01231600
 01231700
 01231800
 01231900
 01232000
 01232100
 01232200
 01232300
 01232400
 01232500
 01232600
 01232700
 01232800
 01232900
 01233000
 01233100
 01233200
 01233300
 01233400
 01233500
 01233600
 01233700
 01233800
 01233900
 01234000
 01234100
 01234200
 01234300
 01234400
 01234500
 01234600
 01234700
 01234800
 01234900
 01235000
 01235100
 01235200

72 Cards 2376 to 2377 have been generalized in the manner previously discussed to allow the tests for the PMP and PMI inspections to be functionally dependent upon variables 234, 235, and 236 which are subsequently dependent upon input parameters save values 189, 190, 195, and 196. Thus, modification of these blocks adds generality to the model and provides functional input dependence, rather than logical dependence upon constants within the model.

	JNLIN4	0,AR437,1,,,AR439	01215100
	SPLIT	1,AR400,,60	01215000
AR439	TEST E	010,45,RLAMA	01215500
	SAVEVALUE	330,41	01215600
	TRANSFER	,RLARA	01215700
ARC	LEAVE	5,ARC	01215800
ARC	TEST E	010,45,POD	01215900
	TEST G	043,0430,POC	01216000
ARC	DATE L9	1,ARC	01216100
	TRANSFER	,POC	01216200
ARC	TEST ME	027,41,POD	01216300
	ASSIGN	25,40	01216400
	ASSIGN	10,40	01216500
	TRANSFER	0,10	01216600
ARC	LEAVE	32,PTPD	01216700
AR450	SAVEVALUE	2,2,1,000,M	01216800
	TRANSFER	,AR455	01216900
ARC	ASSIGN	27,41	01217000
	TEST E	035,000,AR456	01217100
	ASSIGN	35,0	01217200
	TRANSFER	,TST4D	01217300
ARC	TEST L	043,0135,POD	01217400
	TRANSFER	,POC	01217500
AR456	TEST L	V107,V230,AR417 GENERAL	01217600
72	TEST L	V11,V230,AR417 TEST FOR CALENDAR PMP	01217700
	TEST L	V109,V235,AR419 GENERAL	01217800
	TRANSFER	,TST4D	01217900
			01218000
			01218100
			01218200
	REPAIR LOCATION AND REPORT SUBROUTINE		01218300
			01218400
ARC	JOIN	32	01218500
	TEST E	010,45,RLARB	01218600
	LEAVE	1	01218700
ARC	TEST E	010,41,RLARC	01218800
	SPLIT	1,0404,,60	01218900
ARC	TEST E	0V1,41,RLARD	01219000
	ASSIGN	10,RLARK	01219100
	TRANSFER	,PPA3	01219200
ARC	LEAVE		01219300
ARC	TEST E	0V2,41,RLARE	01219400
	TEST E	0V7,40,RLARE	01219500
	ASSIGN	10,V00	01219600
	TEST L	010,401(4,2),RLARL	01219700
	ASSIGN	10,401(4,2)	01219800
ARC	ADVANCE	010	01219900
	SAVEVALUE	300,41	01220000
ARC	REPAIRITY	00,0 JPPED	01220100
	REPAIRITY	00	01220200
	JNLIN4	32,J040,ALL,10,010,AAA	01220300

73 Card 2401 has been modified to make the NORS test a greater than rather than a less than or equal to as originally employed.

*
 *
 * 444034ER ASSESSMENT SUBROUTINE

4244 ASSIGN 1,43
 4245 ASSIGN V47,4439
 TEST E 025,1350,4441
 ASSIGN V51,4401
 TRANSFER ,4445
 4241 ASSIGN V51,4455
 4242 LOOP 1,4249

*
 *
 * 4242 SUBROUTINE

4243 TEST E 025,41350,4242
 4244 ASSIGN 4,459
 TRANSFER ,4245
 4248 ASSIGN 3,4130
 4245 TRANSFER 9
 TEST L 00,42,39EA
 ASSIGN 0,42

*
 * 39E SUBROUTINE

39FA TRANSFER ,4454
 39EB ASSIGN 1,457
 ADVANCE 01
 SAVEVALUE 370,01

*
 *
 *
 * 4454COUPLED MAINTENANCE ROUTINE

4454 TEST NE 017,419,44525
 ASSIGN 17,423
 44525 TEST E 027,43,4458
 4453 ASSIGN 3,029
 ASSIGN 2,026
 ASSIGN 26,41
 4454 2J2UE V27
 2J2UE 25
 445E GATE LR 20,445C
 ASSIGN 7,429
 ASSIGN 20,435
 ASSIGN 9,1
 445D TEST GE 047,03,445F
 TEST LE 04,030,445F
 445E DEPART V27
 DEPART 25

01205500
 00205600
 01205700
 01205800
 01205900
 01206000
 01206100
 01206200
 01206300
 01206400
 01206500
 01206600
 01206700
 01206800
 01206900
 01207000
 01207100
 01207200
 01207300
 01207400
 01207500
 01207600
 01207700
 01207800
 01207900
 01208000
 01208100
 01208200
 01208300
 01208400
 01208500
 01208600
 01208700
 01208800
 01208900
 01209000
 01209100
 01209200
 01209300
 01209400
 01209500
 01209600
 01209700
 01209800
 01209900
 01210000
 01210100
 01210200
 01210300
 01210400
 01210500

	ENTER	07,P3	00250600
	ADVANCE	00	00250700
	TEST NE	0117,01,AR410	00250800
AR415	LEAVE	07,P3	00250900
	JNLIN4	07,JNL4,ALL	00251000
	SAVEVALUE	20,02,017,V36	00251100
	TEST NE	017,010,AR410	00251200
AR461	SAVEVALUE	V590,V36	00251300
	SAVEVALUE	000,V36	00251400
	SAVEVALUE	V190,V36	00251500
	SAVEVALUE	9750,V36	00251600
	SAVEVALUE	V190,V36	00251700
	SAVEVALUE	11750,V36	00251800
	TEST NE	012,01,AR457	00251900
	SAVEVALUE	50,V06,V50,V36	00252000
AR459	TEST E	026,00,J494	00252100
	TEST NE	05,00000,CAN4	00252200
	TEST NE	012,01,CAN4	00252300
	TEST E	025,01350,UN9,1	00252400
	SPLIT	1,1444,,60	00252500
	ASSIGN	17,021	00252600
	TEST E	V19,F42,M2AA	00252700
J49L	TEST E	010,00,J494	00252800
	SPLIT	1,2L49F,,50	00252900
	SPLIT	1,2L49G,,60	00253000
J494	TRANSFER	,AR4A	00253100
AR410	SAVEVALUE	50,V06,06,V36	00253200
	SAVEVALUE	V2220,V36	00253300
	SAVEVALUE	5500,V36	00253400
	SAVEVALUE	V2230,V36	00253500
	SAVEVALUE	11500,V36	00253600
	TEST E	026,00,J494	00253700
	TERMINATE		00253800
J499	SPLIT	1,J494,,60	00253900
	TRANSFER	,J49T	00254000
J494	ASSIGN	3,00000	00254100
	ASSIGN	3,031	00254200
	ASSIGN	2,027	00254300
	ASSIGN	26,01	00254400
	TRANSFER	,J49C	00254500
AR410	ADVANCE	010	00254600
	ASSIGN	26,0	00254700
	ASSIGN	00,010	00254800
	SAVEVALUE	1000,010	00254900
	TRANSFER	,AR415	00255000
J49C	ASSIGN	7,V27	00255100
	ASSIGN	20,V36	00255200
	ASSIGN	9,00	00255300
	TRANSFER	,J499	00255400
J499	ASSIGN	23,047	00255500
	ASSIGN	21,0J49E	00255600
	LEN4	07,003	00255700
J499	ASSIGN	10,V36	00255800
	ASSIGN	0,020	00255900
	ASSIGN	26,01	00256000

74 Cards 2607 through 2608 have been modified in the manner previously discussed to ensure against improper activation of the PMI and PMP logic and also to generalize the test for PMP and PMI activation.

	TEST E	P8,41,UNSS		00256100
	DEPART	V27		00256200
	DEPART	25		00256300
	PRIORITY	1,1JPPER		00256400
	TEST NE	P12,41,AR411		00256500
	PRIORITY	60		00256600
J494	ASSIGN	8,P19		00256700
	ASSIGN	26,40		00256800
	TEST NE	V35,0,AR459		00256900
	TEST E	P8,40,UNSS		00257000
	TRANSFER	,J494		00257100
AR411	PRIORITY	0		00257200
	TRANSFER	,UNSS		00257300
AR457	SAVEVALUE	5,V46,06,V36		00257400
	TRANSFER	,AR455		00257500
AR459	DATE	V27		00257600
	DATE	25		00257700
	DATE LS	20		00257800
	DEPART	V27		00257900
	DEPART	25		00258000
	TRANSFER	,J494		00258100
				00258200
				00258300
				00258400
				00258500
				00258600
				00258700
				00258800
				00258900
				00259000
AR4A	DATE	P26		00259100
	PRIORITY	90,9JPPER		00259200
	TEST NE	P20,4123,ARRB		00259300
	TEST NE	P8,40,ARRB		00259400
	TEST E	P444.1,ARRB		00259500
	TRANSFER	.533,ARRB,ARR4		00259600
AR4M	LOGICS	21		00259700
AR4B	ASSIGNABLE	P24		00259800
AR4J	DATE	84LAR2		00259900
	ASSIGN	19,40		00260000
	ASSIGN	28,40		00260100
	ASSIGN	20,40		00260200
	ASSIGN	25,40		00260300
	ASSIGN	16,40		00260400
AR4C	DATE	9		00260500
	SAVEVALUE	1890,V60		00260600
	TEST E	P27,41,ARRD		00260700
	ASSIGN	27,41		00260800
	TRANSFER	,ARRC		00260900
AR4D	DATE LS	21,ARRP		00261000
AR4E	LOGICS	21		00261100
	TEST NE	P35,999,ARRB		00261200
	TEST L	V187,V234,AR417	GENERAL	00261300
	TEST L	V11,V236,AR417	TEST FOR CALENDAR PHP	00261400
	TEST L	V108,V235,AR419	GENERAL	00261500
AR4B	ASSIGN	17,2		00261600
	DATE	84		00261700
	ASSIGN	5,40		00261800

75 Card 2619 has been added to allow model activation without a daily inspection.

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76 Card 2637 has been added to prevent off-shift maintenance.

77 Cards 2638 and 2639 have been added to provide accounting of NORS delay time.

	DATE L3	20	01266900
	LOGICR	20	01266900
	TEST E	1475, 40, 4394	01267000
	ASSIGN	1, 475	01267100
	JULINK	20, 2043, 1, 14, 21	01267200
	DIFFER		01267300
VJRC	TRANSLATE	11	01267400
	SAVEVALUE	50, 435, 2, 41, 4	01267500
	LOGICR	23	01267600
	ASSIGN	13, 414	01267700
	TRANSLATE	5	01267800
	ASSIGN	1, 45331	01267900
CANP	ASSIGN	3, 454	01268000
	ASSIGN	2, 457	01268100
	ASSIGN	0, 455	01268200
	TEST L	20, 45, 454	01268300
	ASSIGN	4, 45	01268400
CANE	DIFFER	427	01268500
	DIFFER	40	01268600
CANP	DATE L3	20, 454	01268700
	ASSIGN	7, 454	01268800
	ASSIGN	20, 455	01268900
	ASSIGN	5, 41	01269000
CANP	TEST GE	207, 23, 454	01269100
	TEST LE	20, 220, 454	01269200
CANP	DEPART	427	01269300
	DEPART	40	01269400
	ENTER	47, 23	01269500
	ADVANCE	20	01269600
	LEAVE	47, 23	01269700
	JULINK	27, 454, 454	01269800
	ASSIGN	17, 23	01269900
	SAVEVALUE	20, 22, 454, 454	01270000
	SAVEVALUE	454, 454	01270100
	SAVEVALUE	454, 454	01270200
	SAVEVALUE	50, 435, 2, 454	01270300
	TEST E	224, 40, 454	01270400
	TEST E	21, 45331, 454	01270500
	TRANSFER	454	01270600
VJRC	ASSIGN	14, 41	01270700
	TRANSLATE	11	01270800
	LINK	30, 454	01270900
VJRC	LOGICR	22	01271000
VJRC	TRANSLATE	11	01271100
	SPLIT	1, 454, 454	01271200
	SPLIT	1, 454, 454	01271300
	SPLIT	1, 454, 454	01271400
	ASSIGN	14, 41	01271500
VJRL	DIFFER	10, 454	01271600
	ASSIGN	2, 454, 1, 454	01271700
	LINK	12	01271800
VJRC	LINK	29, 23	01271900
VJRC	LOGICR	23	01272000
	DIFFER		01272100

78 Card 2774 has been added to prevent off-shift maintenance.

	TRANSFER	,VJRRJ	00272200
C4VB	SPLIT	1,VJRV,,60	00272300
	ASSIGN	22,X4*23	00272400
	SPLIT	1,VJRV,,60	00272500
VJRRJ	PRIORITY	50	00272600
	ASSIGN	1,V61	00272700
	ASSIGN	3,V68	00272800
	TEST E	23,X4*23(1,P14),VJRRJ	00272900
	SAVEVALUE	4,1,X14,X3	00273000
VJRRJ	ADVANCE	01	00273100
	ASSIGN	10,X15	00273200
	TABLE	6	00273300
	TABLE	17	00273400
	DATE LR	25	00273500
	TEST E	V62,X428	00273600
	LOGIC	25	00273700
	SAVEVALUE	62,P32	00273800
	JULINK	28,VRRP,ALL	00273900
	DATE LR	25	00274000
	DATE LR	25,CAND	00274100
	LOGIC	26	00274200
C4VV	TERMINATE		00274300
C4VC	LOGIC	24	00274400
	TEST E	22,X4*23,VJRRJ	00274500
	SAVEVALUE	75,X1,X	00274600
	TRANSFER	,VJRRJ	00274700
VJRRJ	JULINK	10	00274800
	DATE LR	27	00274900
	DATE LR	28,VRRP	00275000
	TEST E	22,X52,VJRRJ	00275100
	LOGIC	29	00275200
	TERMINATE		00275300
VJRRJ	ADVANCE	10	00275400
	PRIORITY	117	00275500
	TRANSFER	,VJRRJ	00275600
C4VA	ASSIGN	24,X4*23	00275700
	JULINK	29,CAND,ALL,12,P14	00275800
	SAVEVALUE	75,P14,X	00275900
	PRIORITY	110,VJRRJ	00276000
	DATE LR	23	00276100
	TRANSFER	,VJRRJ	00276200
VJRRJ	DATE LR	25,VRRP	00276300
	LOGIC	27	00276400
	JULINK	29,VRRP,ALL,12,P14	00276500
	VJRRJ		00276600
	SCAN	10,22,X62,,VJRRJ	00276700
	LOGIC	24	00276800
	LOGIC	27	00276900
	LOGIC	25	00277000
	TEST E	210,X1,VJRRJ	00277100
	ASSIGN	22,X42	00277200
VJRRJ	LOGIC	26	00277300
	TEST E	5V19,X1 TEST FOR PREVENTING JFF SHIPP MAINT.	00277400
	SAVEVALUE	536,X1	00277500

79 Cards 2776 and 2777 have been added to account for NORS times by aircraft and platoon.

79	SAVEVALUE	V2326.41	THESE SAVEVALUES SHOULD ACCOUNT	01277400
	SAVEVALUE	14234.41	FOR 4734 BY A/C & C7.	01277700
	JULIAC	30,4734,ALL.13,PIU		01277900
	RECHUR	12		01277900
V30X	SPLIT	1.21425		01279000
	TRANSFER	.4234		01279100
V30J	LOSTIC	27		01279200
	DATE LQ	25		01279300
	TRANSFER	.4734		01279400
C4VF	ASSIST	7.427		01279500
	ASSIST	20.473		01279600
	ASSIST	9.47		01279700
	TRANSFER	.2443		01279800
C4VJ	ASSIST	21.447		01279900
	ASSIST	21.92444		01279900
	LTAC	27.223		01279100
C4VL	ASSIST	19.439		01279200
	ASSIST	4.223		01279300
	ASSIST	26.41		01279400
	TEST E	23.47, C4VK		01279500
	DEPART	V27		01279600
	DEPART	44		01279700
	PRICITV	1.34734		01279800
	PRICITV	90		01279900
C4V4	ASSIST	4.213		01280000
	ASSIST	26.47		01280100
	TRANSFER	.2443		01280200
				01280300
				01280400
				01280500
				01280600
				01280700
				01280800
				01280900
				01281000
				01281100
				01281200
				01281300
				01281400
				01281500
				01281600
				01281700

	SERVICE PLATON, DIRECT SUPPORT, GENERAL SUPPORT COMP REPAIR		
T444	ASSIST	6.46	
	TRANSFER	.1443	
T444	ASSIST	4.463	
	ADJUSTATE	13	
	ADJUSTATE	14	
	TEST LE	V133.241, AR46	
	TEST LE	V140.241, AR47	
	TEST VE	V65.40, T444	
	TEST L	24.46, T443	

	ASSIGN	0,45	01241400
1440	DEFE	05	01241400
1440	DATE SVP	0400,1440	01242000
	DEPART	05	01242100
	ENTER	0400	01242200
	ASSIGN	32,047	01242300
	DEFE	05	01242400
1440	TEST SE	0032,031,1445	01242500
	DEPART	05	01242600
	ENTER	032,031	01242700
	SAVEVALUE	0500,070	01242800
	SAVEVALUE	750,070	01242900
	ADVANCE	00	01243000
	LEAVE	0400	01243100
	LEAVE	032,031	01243200
	JULIAC	31,1440,ALL	01243300
	JULIAC	55,1440,ALL,32,032	01243400
	ASSIGN	0,45	01243500
	SAVEVALUE	77,047,4	01243600
	TEST L	0477,071,0400	01243700
	ASSIGN	0,45	01243800
	TEST S	0477,072,0400	01243900
	ASSIGN	0,45	01244000
	TEST S	0477,073,0400	01244100
	ASSIGN	0,45	01244200
	SAVEVALUE	1000,41	01244300
1440	SAVEVALUE	50,040,06,41,4	01244400
	SAVEVALUE	50,040,06,070	01244500
	SAVEVALUE	0130,070	01244600
	SAVEVALUE	0500,070	01244700
	SAVEVALUE	0130,070	01244800
	SAVEVALUE	1250,070	01244900
	TEST E	06,44,0400	01245000
DEPA	TABLE	15	01245100
	TERMINATE		01245200
02405	SAVEVALUE	1700,41	01245300
	TRANSFER	,1440	01245400
02406	SAVEVALUE	1000,41	01245500
	TRANSFER	,02405	01245600
02407	SAVEVALUE	1000,41	01245700
	TRANSFER	,02406	01245800
02408	ASSIGN	12,1	01245900
	POSTIVITY	0	01246000
	ASSIGN	20,031	01246100
	ASSIGN	30,45	01246200
	TEST E	020,45,02408	01246300
	ASSIGN	26,42	01246400
02409	ASSIGN	27,1	01246500
	ASSIGN	17,10	01246600
	ASSIGN	0,7	01246700
	SAVEVALUE	1170,41	01246800
	SAVEVALUE	50,040,06,41,4	01246900
	TRANSFER	,02409	01247000
02410	ASSIGN	26,3	01247100

80 Cards 2888 and 2889 have been modified to allow for up to 24 TBO components.

81 Cards 2990 and 2991 have been revised to define new save values as a result of increasing the platoon size to 24 aircraft.

82 Card 2994 has been modified to allow for 24 TBO components.

83 Cards 2998 and 3002 have been added to account for NORS times.

84 Cards 3008, 3012, and 3023 have been modified, due to the save value changes generated by increasing the model size to 24 aircraft.

	499134	3, V190		01297900
	499134	4, V191		00299000
	SAVEVALUE	V177, V192		00299100
	SAVEVALUE	V199, V182		01299200
	LONG	5, AR435		00299300
	SAVEVALUE	5570, V193		00299400
	SAVEVALUE	1130, V183		01299500
	499134	6, K1		00299600
	499134	1, 526		00299700
	499134	2, 551		01299800
	499134	3, 251		00299900
(81)	499134	4, 776		00299000
	499134	5, 1451		00299100
12440	499134	7, V212		00299200
	SAVEVALUE	V193, V213		00299300
(82)	TEST 2	06, K191, AR443		00299400
	SAVEVALUE	657, V214		00299500
	SAVEVALUE	193, V215		01299600
	499134	2, 699		00299700
(83)	499134	3, 1424	ESTABLISH SAVEVALUE NOS. FOR NOS /AVAIL.	00299800
	499134	1, 574		00299900
12443	SAVEVALUE	42, V216		00300000
	499134	2, K1		00300100
(83)	499134	3, K1	SET UP SAVE FOR NOS FOR CALC. AVAIL	00300200
	TEST 2	01, 691, AR448		00300300
	LONG	1, AR449		00300400
	TEST 4			00300500
12449	SAVEVALUE	700, V217		00300600
	499134	1, 226		00300700
(84)	499134	2, 1426		00300800
	499134	3, 201		00300900
	499134	4, 701		00301000
12450	SAVEVALUE	48, V219		00301100
(84)	TEST 2	04, 724, AR451		00301200
	499134	10, 1		00301300
	499134	20, 1		00301400
	499134	30, 1		00301500
	499134	40, 1		00301600
	TRANSFER	, 42450		00301700
12451	SAVEVALUE	725, V220		00301800
	499134	1, 226		00301900
	499134	2, 201		00302000
	499134	3, 726		00302100
12452	SAVEVALUE	43, V218		00302200
(84)	TEST 2	03, 740, AR453		00302300
	499134	10, 1		00302400
	499134	20, 1		00302500
	499134	30, 1		00302600
	TRANSFER	, 42452		00302700
12453	SAVEVALUE	750, V221		00302800

	ASSIGN	2.411	01302000
DCR	ASSIGN	3.4X1(6,P2)	01303000
	TEST GE	P3.41,DCRC	01303100
	ASSIGN	17.25	01303200
	SAVEVALUE	20,P3,P17,P3	01303300
	SAVEVALUE	20+,P3	01303400
	SAVEVALUE	V30+,P3	01303500
DCRC	LOAD	2.0025	01303600
	TEST E	4X1(5.8).40,DCRE	01303700
DCRC	ASSIGN	2.25	01303800
	RENAME FOR SVAE RJN9		01303900
DCRE	TRANSFER		01304000
	ASSIGN	2.25	01304100
DCRS	ASSIGN	3.418	01304200
DCRF	ASSIGN	5.4X2(P3,P2)	01304300
	SAVEVALUE	20.15,42.45	01304400
	LOAD	3.0025	01304500
	LOAD	2.0025	01304600
DCRC	TRANSFER	,REFA	01304700
AR483	ASSIGN	10.41	01304800
	ASSIGN	20.41	01304900
	ASSIGN	30.41	01305000
	ASSIGN	40.41	01305100
	ASSIGN	50.41	01305200
	ASSIGN	60.41	01305300
	TRANSFER	,AR484	01305400
REFA	SAVEVALUE	195,V229	01305500
	SAVEVALUE	195,V230	01305600
	PLIT	1.0022	01305610
	TRANSFER		01305611
	TERMINATE	1	01305700
RENA	ASSIGN	2.43	01305800
	ASSIGN	3.4X1(5,7)	01305900
	SAVEVALUE	20.0.17,P3	01306000
	SAVEVALUE	V37+,P3	01306100
	SAVEVALUE	32+,P3	01306200
RECE	SAVEVALUE	90+,41	01306300
	SAVEVALUE	197+,41	01306400
	SAVEVALUE	V195+,41	01306500
	SAVEVALUE	600+,41	01306600
	SAVEVALUE	V198+,41	01306700
	SAVEVALUE	1200+,41	01306800
	SAVEVALUE	V195+,41	01306900
	SAVEVALUE	675+,41	01307000
	SAVEVALUE	V198+,41	01307100
	SAVEVALUE	1275+,41	01307200
	TERMINATE		01307300
REB3	TRANSFER	9	01307400
	SAVEVALUE	35+,41	01307500
	SAVEVALUE	65+,41	01307600
	TERMINATE		01307700
RECB	TERMINATE		01307800
RETA	PRIVACY	0	01307900

85 The START card has been modified to suppress the output of the GPSS chains and give 5 intermediate outputs.

This card should be tailored to the specific needs of the analyst by referring to the IBM GPSS manual.

86 The output editor has been modified to contain the baseline CH-47 mission and maintenance concept narrative.

Also, the output editor has been modified to accommodate a platoon size of 24 aircraft.

	ADVANCE	460		00309000
DATA1	ASSIGN	2,48		00309100
DATA2	ADVANCE	230		00309200
	TEXT E	V224,40,DATA8		00309300
DATA3	ADVANCE	410		00309400
	LOGP	2,DATA2		00309500
	ADVANCE	4710		00309600
	TEXT E	V224,40,DATA6		00309700
DATA5	ADVANCE	410		00309800
	TRANSFER	,DATA1		00309900
DATA8	SAVEVALUE	199-,V225		00310000
	SAVEVALUE	197-,V227		00310100
	TRANSFER	,DATA3		00310200
DATA6	SAVEVALUE	199-,V226		00310300
	SAVEVALUE	197-,V228		00310400
	TRANSFER	,DATA5		00310500
	LIST			00310600
85	START	5,1		00310700
	EJECT			00310800
	SPACE	3		00310900
86-57	TEXT	ARMY R & M SIMULATION MODEL		003110100
57	TEXT	-----		003110200
	SPACE	2		003110300
2	TEXT	SCENARIO7 SIMULATED		003110400
	SPACE	1		003110500
3	TEXT	THE PLATOON OF SIXTEEN ARMY HELICOPTERS		003110600
	SPACE	1		003110700
4	TEXT	FLYING PROGRAM CONSISTED OF SEVEN FLYING DAYS PER WEEK		003110800
	WITH EACH SIMULATION INTERVAL COVERING A FOUR WEEK PERIOD,			003110900
	SPACE	1		003111000
5	TEXT	MISSION LENGTH IS 1.5 HOURS WITH A DEMAND OF 50 FLY		003111100
	ING HOURS PER AIRCRAFT FOR THE FOUR WEEK PERIOD,			003111200
	SPACE	1		003111300
6	TEXT	LAUNCH SCHEDULE DURING EACH FLYING DAY		003111400
5	TEXT	0700 3 AIRCRAFT 0930 3 AIRCRAFT		003111500
5	TEXT	1000 3 AIRCRAFT 1130 3 AIRCRAFT		003111600
5	TEXT	1300 3 AIRCRAFT 1430 3 AIRCRAFT		003111700
5	TEXT	1600 3 AIRCRAFT 1730 3 AIRCRAFT		003111800
5	TEXT	1900 3 AIRCRAFT		003111900
	SPACE	1		003112000
8	TEXT	OTHER FLIGHT CONSIDERATIONS		003112100
5	TEXT	STANDBY AIRCRAFT READY AT ALL TIMES		003112200
	DURING THE SCHEDULED FLYING INTERVALS,			003112300
6	TEXT	MISSION FLIGHT IS POSSIBLE UP TO THIRTY MINUTES AFTER		003112400
	SCHEDULED FLIGHT TIME; AFTER THIS INTERVAL, FLIGHT IS SCRUBBED,			003112500
	SPACE	2		003112600
2	TEXT	MAINTENANCE CONCEPT SIMULATED		003112700
	SPACE	1		003112800
4	TEXT	PERIODIC MAINTENANCE INSPECTIONS		003112900
	OCCUR EVERY 100 FLYING HOURS			003113000
	SPACE	1		003113100

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0	TEXT			00313200
	SPACE	1		00313300
0	TEXT		PREVENTIVE MAINTENANCE DAILY (PMD) INSPECTIONS OCCUR	00313400
DAILY	IF THE AIRCRAFT HAS FLOWN 72 HOURS IF NOT FLYING.			00313500
	SPACE	1		00313600
0	TEXT		MAINTENANCE PERSONNEL ARE AVAILABLE BETWEEN 0600 AND	00313700
2200	DURING THE SEVEN DAY FLYING PERIOD PER WEEK			00313800
	SPACE	1		00313900
0	TEXT		THE ONLY EXCEPTION TO THE ABOVE OCCURS WHEN THERE ARE	00314000
NOT	SUFFICIENT AIRCRAFT TO MEET THE FIRST MISSION DEMAND OF NEXT DAY			00314100
	SPACE	1		00314200
0	TEXT		THE AIRCRAFT CONSISTS OF 223 ELEMENTS. THERE ARE 16	00314300
TIME	CHANGE COMPONENTS.			00314400
	SPACE	1		00314500
0	TEXT		AN INTERMEDIATE INSPECTION IS PERFORMED EVERY 10	00314600
FLIGHT	HOURS			00314700
	SPACE	1		00314800
0	TEXT		ORGANIZATIONAL MAINTENANCE INCLUDES AN INTEGRATED DIR	00314900
ECT	REPAIR MAINTENANCE CAPABILITY			00315000
	SPACE	1		00315100
0	TEXT		OFF EQUIPMENT COMPONENT MAINTENANCE IS PERFORMED	00315200
AT	THE DEPT LEVEL.			00315300
	SPACE	1		00315400
0	TEXT		CLASSIFICATION OF WTS STATUS IS A DUMMY	00315500
	SPACE	1		00315600
2	TEXT		EVALUATION	00315700
	SPACE	1		00315800
10	TEXT		BASIC C-4007C MISSION AND MAINTENANCE SCHEDULE	00315900
	SPACE	1		00316000
10	TEXT		MONTHLY MISSION	00316100
	SPACE	1		00316200
10	TEXT		INFORMATION	00316300
	SPACE	3		00316400
10	TEXT		AIRCRAFT MISSIONS MISSIONS	00316500
	SPACE	1		00316600
10	TEXT		TAIL NUMBER CALLS FLOWN	00316700
	SPACE	3		00316800
10	TEXT		1 00201,2/XXXX 00226	00316900
	SPACE	1		00317000
10	TEXT		2 00251,2/1,XXXX,XX 00227	00317100
	SPACE	3		00317200
10	TEXT		2 00252,2/1,XXXX,XX 00228	00317300
	SPACE	3		00317400
10	TEXT		3 00253,2/1,XXXX,XX 00228	00317500
	SPACE	1		00317600
10	TEXT		3 00253,2/1,XXXX,XX 00228	00317700
	SPACE	1		00317800
10	TEXT		3 00253,2/1,XXXX,XX 00228	00317900
	SPACE	1		00318000
10	TEXT		3 00253,2/1,XXXX,XX 00228	00318100

SPACE	3		00319200
10 TEXT		4	00319300
,2/XXXX		0X254,2/1_XXXX,X0	00319400
SPACE	3		00319500
10 TEXT		5	00319600
,2/XXXX		0X255,2/1_XXXX,X0	00319700
SPACE	3		00319800
10 TEXT		6	00319900
,2/XXXX		0X256,2/1_XXXX,X0	00319000
SPACE	3		00319100
10 TEXT		7	00319200
,2/XXXX		0X257,2/1_XXXX,X0	00319300
SPACE	3		00319400
10 TEXT		8	00319500
,2/XXXX		0X258,2/1_XXXX,X0	00319600
SPACE	3		00319700
10 TEXT		9	00319800
,2/XXXX		0X259,2/1_XXXX,X0	00319900
SPACE	3		00320000
10 TEXT		10	00320100
,2/XXXX		0X260,2/1_XXXX,X0	00320200
SPACE	3		00320300
10 TEXT		11	00320400
,2/XXXX		0X261,2/1_XXXX,X0	00320500
SPACE	3		00320600
10 TEXT		12	00320700
,2/XXXX		0X262,2/1_XXXX,X0	00320800
SPACE	3		00320900
10 TEXT		13	00321000
,2/XXXX		0X263,2/1_XXXX,X0	00321100
SPACE	3		00321200
10 TEXT		14	00321300
,2/XXXX		0X264,2/1_XXXX,X0	00321400
SPACE	3		00321500
10 TEXT		15	00321600
,2/XXXX		0X265,2/1_XXXX,X0	00321700
SPACE	3		00321800
10 TEXT		16	00321900
,2/XXXX		0X266,2/1_XXXX,X0	00322000
SPACE	3		00322100
10 TEXT		17	00322200
,2/XXXX		0X267,2/1_XXXX,X0	00322300
SPACE	3		00322400
10 TEXT		18	00322500
,2/XXXX		0X268,2/1_XXXX,X0	00322600
SPACE	3		00322700
10 TEXT		19	00322800
,2/XXXX		0X269,2/1_XXXX,X0	00322900
SPACE	3		00323000
10 TEXT		20	00323100
,2/XXXX		0X270,2/1_XXXX,X0	00323200
SPACE	3		00323300
10 TEXT		21	00323400
		0X271,2/XXXX	

,2/XXXX			0X271,2/1,XXXX,XX	00323500
SPACE	3			00323600
13 TEXT		22	0X222,2/XXXX	0X247=00323700
,2/XXXX			0X272,2/1,XXXX,XX	00323800
SPACE	3			00323900
13 TEXT		23	0X223,2/XXXX	0X248=00324000
,2/XXXX			0X273,2/1,XXXX,XX	00324100
SPACE	3			00324200
13 TEXT		24	0X224,2/XXXX	0X249=00324300
,2/XXXX			0X274,2/1,XXXX,XX	00324400
13 TEXT			-----	00324500
SPACE	2			00324600
13 TEXT			0X225,2/XXXX	0X250=00324700
,2/XXXX			0X275,2/1,XXXX,XX	00324800
EJECT				00324900
13 TEXT			0X275,2/1,XXXX,XX	00325000
SPACE	1			00325100
13 TEXT			INSPECTION INFORMATION	00325200
			-----	00325300
SPACE	3			00325400
8 TEXT			ATCRAFT PREFLIGHT PREFLIGHT DAILY	00325500
DAILY			DAY DAY DAY DAY	00325600
8 TEXT			TALE NUMBER OF MAINT. NUMBER OF	00325700
MAINT.			NUMBER OF MAINT. NUMBER OF	00325800
8 TEXT			NUMBER OF MAINT. NUMBER OF	00325900
MAINT.			NUMBER OF MAINT. NUMBER OF	00326000
SPACE	3			00326100
13 TEXT			0X276,2/XXXX	0X301,2/2LXXXX,XX=00326200
0X326,2/XXXX			0X351,2/2LXXXX,XX	00326300
79 TEXT			0X376,2/XXXX	0X001,2/2LXXXX,XX=00326400
029,2/XXXX			0X031,2/2LXXXX,XX	00326500
SPACE	3			00326600
13 TEXT			0X277,2/XXXX	0X302,2/2LXXXX,XX=00326700
0X327,2/XXXX			0X352,2/2LXXXX,XX	00326800
79 TEXT			0X377,2/XXXX	0X002,2/2LXXXX,XX=00326900
027,2/XXXX			0X052,2/2LXXXX,XX	00327000
SPACE	3			00327100
13 TEXT			0X278,2/XXXX	0X303,2/2LXXXX,XX=00327200
0X328,2/XXXX			0X353,2/2LXXXX,XX	00327300
79 TEXT			0X378,2/XXXX	0X003,2/2LXXXX,XX=00327400
029,2/XXXX			0X053,2/2LXXXX,XX	00327500
SPACE	3			00327600
13 TEXT			0X279,2/XXXX	0X304,2/2LXXXX,XX=00327700
0X329,2/XXXX			0X354,2/2LXXXX,XX	00327800
79 TEXT			0X379,2/XXXX	0X004,2/2LXXXX,XX=00327900
027,2/XXXX			0X054,2/2LXXXX,XX	00328000
SPACE	3			00328100
13 TEXT			0X280,2/XXXX	0X305,2/2LXXXX,XX=00328200
0X330,2/XXXX			0X355,2/2LXXXX,XX	00328300
79 TEXT			0X380,2/XXXX	0X005,2/2LXXXX,XX=00328400
033,2/XXXX			0X055,2/2LXXXX,XX	00328500
SPACE	3			00328600

3	TEXT	6	0x281,2/xxxx	0x306,2/2Lxxx,x=00328800
x0		0x331,2/xxxx	0x356,2/2Lxxx,xxx	00329000
79	TEXT	0x391,2/xxxx	0x006,2/2Lxxx,xxx	0x=00329000
031,2/xxxx		0x056,2/2Lxxx,xxx		00329100
	SPACE	3		00329200
3	TEXT	7	0x282,2/xxxx	0x307,2/2Lxxx,x=00329300
x0		0x332,2/xxxx	0x357,2/2Lxxx,xxx	00329400
79	TEXT	0x392,2/xxxx	0x007,2/2Lxxx,xxx	0x=00329500
032,2/xxxx		0x057,2/2Lxxx,xxx		00329600
	SPACE	3		00329700
3	TEXT	9	0x283,2/xxxx	0x308,2/2Lxxx,x=00329800
x0		0x333,2/xxxx	0x358,2/2Lxxx,xxx	00329900
79	TEXT	0x393,2/xxxx	0x009,2/2Lxxx,xxx	0x=00330000
033,2/xxxx		0x058,2/2Lxxx,xxx		00330100
	SPACE	3		00330200
3	TEXT	9	0x284,2/xxxx	0x309,2/2Lxxx,x=00330300
x0		0x334,2/xxxx	0x359,2/2Lxxx,xxx	00330400
79	TEXT	0x394,2/xxxx	0x009,2/2Lxxx,xxx	0x=00330500
034,2/xxxx		0x059,2/2Lxxx,xxx		00330600
	SPACE	3		00330700
3	TEXT	10	0x285,2/xxxx	0x310,2/2Lxxx,x=00330800
x0		0x335,2/xxxx	0x360,2/2Lxxx,xxx	00330900
79	TEXT	0x395,2/xxxx	0x010,2/2Lxxx,xxx	0x=00331000
035,2/xxxx		0x060,2/2Lxxx,xxx		00331100
	SPACE	3		00331200
3	TEXT	11	0x286,2/xxxx	0x311,2/2Lxxx,x=00331300
x0		0x336,2/xxxx	0x361,2/2Lxxx,xxx	00331400
79	TEXT	0x396,2/xxxx	0x011,2/2Lxxx,xxx	0x=00331500
036,2/xxxx		0x061,2/2Lxxx,xxx		00331600
	SPACE	3		00331700
3	TEXT	12	0x287,2/xxxx	0x312,2/2Lxxx,x=00331800
x0		0x337,2/xxxx	0x362,2/2Lxxx,xxx	00331900
79	TEXT	0x397,2/xxxx	0x012,2/2Lxxx,xxx	0x=00332000
037,2/xxxx		0x062,2/2Lxxx,xxx		00332100
	SPACE	3		00332200
3	TEXT	13	0x288,2/xxxx	0x313,2/2Lxxx,x=00332300
x0		0x338,2/xxxx	0x363,2/2Lxxx,xxx	00332400
79	TEXT	0x398,2/xxxx	0x013,2/2Lxxx,xxx	0x=00332500
038,2/xxxx		0x063,2/2Lxxx,xxx		00332600
	SPACE	3		00332700
3	TEXT	14	0x289,2/xxxx	0x314,2/2Lxxx,x=00332800
x0		0x339,2/xxxx	0x364,2/2Lxxx,xxx	00332900
79	TEXT	0x399,2/xxxx	0x014,2/2Lxxx,xxx	0x=00333000
039,2/xxxx		0x064,2/2Lxxx,xxx		00333100
	SPACE	3		00333200
3	TEXT	15	0x290,2/xxxx	0x315,2/2Lxxx,x=00333300
x0		0x340,2/xxxx	0x365,2/2Lxxx,xxx	00333400
79	TEXT	0x390,2/xxxx	0x015,2/2Lxxx,xxx	0x=00333500
040,2/xxxx		0x065,2/2Lxxx,xxx		00333600

	SPACE	3			00333700
3	TEXT	16	#X291,2/XXXX	#X316,2/2LXXX,X=00333800	
X0			#X301,2/XXXX	#X366,2/2LXXX,XX#	00333900
79	TEXT		#X391,2/XXXX	#X416,2/2LXXX,XX#	#X=00334000
001,2/XXXX			#X066,2/2LXXX,XX#		00334100
	SPACE	3			00334200
3	TEXT	17	#X292,2/XXXX	#X317,2/2LXXX,X=00334300	
X0			#X302,2/XXXX	#X367,2/2LXXX,XX#	00334400
79	TEXT		#X392,2/XXXX	#X417,2/2LXXX,XX#	#X=00334500
002,2/XXXX			#X067,2/2LXXX,XX#		00334600
	SPACE	3			00334700
3	TEXT	18	#X293,2/XXXX	#X318,2/2LXXX,X=00334800	
X0			#X303,2/XXXX	#X368,2/2LXXX,XX#	00334900
79	TEXT		#X393,2/XXXX	#X418,2/2LXXX,XX#	#X=00335000
003,2/XXXX			#X068,2/2LXXX,XX#		00335100
	SPACE	3			00335200
3	TEXT	19	#X294,2/XXXX	#X319,2/2LXXX,X=00335300	
X0			#X304,2/XXXX	#X369,2/2LXXX,XX#	00335400
79	TEXT		#X394,2/XXXX	#X419,2/2LXXX,XX#	#X=00335500
004,2/XXXX			#X069,2/2LXXX,XX#		00335600
	SPACE	3			00335700
3	TEXT	20	#X295,2/XXXX	#X320,2/2LXXX,X=00335800	
X0			#X305,2/XXXX	#X370,2/2LXXX,XX#	00335900
79	TEXT		#X395,2/XXXX	#X420,2/2LXXX,XX#	#X=00336000
005,2/XXXX			#X070,2/2LXXX,XX#		00336100
	SPACE	3			00336200
3	TEXT	21	#X296,2/XXXX	#X321,2/2LXXX,X=00336300	
X0			#X306,2/XXXX	#X371,2/2LXXX,XX#	00336400
79	TEXT		#X396,2/XXXX	#X421,2/2LXXX,XX#	#X=00336500
006,2/XXXX			#X071,2/2LXXX,XX#		00336600
	SPACE	3			00336700
3	TEXT	22	#X297,2/XXXX	#X322,2/2LXXX,X=00336800	
X0			#X307,2/XXXX	#X372,2/2LXXX,XX#	00336900
79	TEXT		#X397,2/XXXX	#X422,2/2LXXX,XX#	#X=00337000
007,2/XXXX			#X072,2/2LXXX,XX#		00337100
	SPACE	3			00337200
3	TEXT	23	#X298,2/XXXX	#X323,2/2LXXX,X=00337300	
X0			#X308,2/XXXX	#X373,2/2LXXX,XX#	00337400
79	TEXT		#X398,2/XXXX	#X423,2/2LXXX,XX#	#X=00337500
008,2/XXXX			#X073,2/2LXXX,XX#		00337600
	SPACE	3			00337700
3	TEXT	24	#X299,2/XXXX	#X324,2/2LXXX,X=00337800	
X0			#X309,2/XXXX	#X374,2/2LXXX,XX#	00337900
79	TEXT		#X399,2/XXXX	#X424,2/2LXXX,XX#	#X=00338000
009,2/XXXX			#X074,2/2LXXX,XX#		00338100
	SPACE	1			00338200
16	TEXT				00338300
					00338400
					00338500
					00338600
0	TEXT	47474LM			00338700

0	TEXT	737AL0	0X300,2/XXXX	0X325,2/2LXXX.XX	00339900
0		0X350,2/XXXX	0X375,2/2LXXX.XX		00339900
79	TEXT	0X400,2/XXXX	0X425,2/2LXXX.XX		00339900
450,2/XXXX		0X475,2/2LXXX.XX			00339900
	SUBJECT				00339900
	SPACE	3			00339900
19	TEXT		40474LY MAINTENANCE		00339900
	SPACE	1			00339900
19	TEXT		INFORMATION		00339900
	SPACE	3			00339900
0	TEXT	AIRCRAFT	NUMBER OF MAINT ACTINGS	MAINTENANCE	00339900
E 44V	WJURS	ELAPSED MAINT. DOWNTIME			00339900
0	TEXT	TAIL			00340000
0	TEXT	UNNUMBER	UNSCHEMULED	SCHEDULED	UNSCHEMULED
0	SCHEDULED	UNSCHEMULED	SCHEDULED		00340100
	SPACE	3			00340200
5	TEXT	1	0X476,2/XXXX	0X501,2/XXXX	00340300
	0X551,2/2LXXX.XX		0X526,2/2LXXX.XX		00340400
77	TEXT	0X601,2/1LXXX.XX	0X576,2/1LXXX.XX		00340500
	SPACE	3			00340600
5	TEXT	2	0X477,2/XXXX	0X502,2/XXXX	00340700
	0X552,2/2LXXX.XX		0X527,2/2LXXX.XX		00340800
77	TEXT	0X602,2/1LXXX.XX	0X577,2/1LXXX.XX		00340900
	SPACE	3			00341000
5	TEXT	3	0X478,2/XXXX	0X503,2/XXXX	00341100
	0X553,2/2LXXX.XX		0X528,2/2LXXX.XX		00341200
77	TEXT	0X603,2/1LXXX.XX	0X578,2/1LXXX.XX		00341300
	SPACE	3			00341400
5	TEXT	4	0X479,2/XXXX	0X504,2/XXXX	00341500
	0X554,2/2LXXX.XX		0X529,2/2LXXX.XX		00341600
77	TEXT	0X604,2/1LXXX.XX	0X579,2/1LXXX.XX		00341700
	SPACE	3			00341800
5	TEXT	5	0X480,2/XXXX	0X505,2/XXXX	00341900
	0X555,2/2LXXX.XX		0X530,2/2LXXX.XX		00342000
77	TEXT	0X605,2/1LXXX.XX	0X580,2/1LXXX.XX		00342100
	SPACE	3			00342200
5	TEXT	6	0X481,2/XXXX	0X506,2/XXXX	00342300
	0X556,2/2LXXX.XX		0X531,2/2LXXX.XX		00342400
77	TEXT	0X606,2/1LXXX.XX	0X581,2/1LXXX.XX		00342500
	SPACE	3			00342600
5	TEXT	7	0X482,2/XXXX	0X507,2/XXXX	00342700
	0X557,2/2LXXX.XX		0X532,2/2LXXX.XX		00342800
77	TEXT	0X607,2/1LXXX.XX	0X582,2/1LXXX.XX		00342900
	SPACE	3			00343000
5	TEXT	8	0X483,2/XXXX	0X508,2/XXXX	00343100
	0X558,2/2LXXX.XX		0X533,2/2LXXX.XX		00343200
77	TEXT	0X608,2/1LXXX.XX	0X583,2/1LXXX.XX		00343300
	SPACE	3			00343400
5	TEXT	9	0X484,2/XXXX	0X509,2/XXXX	00343500
	0X559,2/2LXXX.XX		0X534,2/2LXXX.XX		00343600
77	TEXT	0X609,2/1LXXX.XX	0X584,2/1LXXX.XX		00343700
	SPACE	3			00343800
5	TEXT	10	0X485,2/XXXX	0X510,2/XXXX	00343900
					00344000

	0X560,2/2LXXX.XX0	0X535,2/2LXXX.XX0	00344100	
77	TEXT 0X610,2/1LXXX.X0	0X595,2/1LXXX.X0	00344200	
	SPACE 3		00344300	
5	TEXT 11	0X496,2/XXXX	0X511,2/XXXX	00344400
	0X561,2/2LXXX.XX0	0X536,2/2LXXX.XX0	00344500	
77	TEXT 0X611,2/1LXXX.X0	0X596,2/1LXXX.X0	00344600	
	SPACE 3		00344700	
5	TEXT 12	0X497,2/XXXX	0X512,2/XXXX	00344800
	0X562,2/2LXXX.XX0	0X537,2/2LXXX.XX0	00344900	
77	TEXT 0X612,2/1LXXX.X0	0X597,2/1LXXX.X0	00345000	
	SPACE 3		00345100	
5	TEXT 13	0X498,2/XXXX	0X513,2/XXXX	00345200
	0X563,2/2LXXX.XX0	0X538,2/2LXXX.XX0	00345300	
77	TEXT 0X613,2/1LXXX.X0	0X598,2/1LXXX.X0	00345400	
	SPACE 3		00345500	
5	TEXT 14	0X499,2/XXXX	0X514,2/XXXX	00345600
	0X564,2/2LXXX.XX0	0X539,2/2LXXX.XX0	00345700	
77	TEXT 0X614,2/1LXXX.X0	0X599,2/1LXXX.X0	00345800	
	SPACE 3		00345900	
5	TEXT 15	0X490,2/XXXX	0X515,2/XXXX	00346000
	0X565,2/2LXXX.XX0	0X540,2/2LXXX.XX0	00346100	
77	TEXT 0X615,2/1LXXX.X0	0X590,2/1LXXX.X0	00346200	
	SPACE 3		00346300	
5	TEXT 16	0X491,2/XXXX	0X516,2/XXXX	00346400
	0X566,2/2LXXX.XX0	0X541,2/2LXXX.XX0	00346500	
77	TEXT 0X616,2/1LXXX.X0	0X591,2/1LXXX.X0	00346600	
	SPACE 3		00346700	
5	TEXT 17	0X492,2/XXXX	0X517,2/XXXX	00346800
	0X567,2/2LXXX.XX0	0X542,2/2LXXX.XX0	00346900	
77	TEXT 0X617,2/1LXXX.X0	0X592,2/1LXXX.X0	00347000	
	SPACE 3		00347100	
5	TEXT 17	0X493,2/XXXX	0X518,2/XXXX	00347200
	0X568,2/2LXXX.XX0	0X543,2/2LXXX.XX0	00347300	
77	TEXT 0X618,2/1LXXX.X0	0X593,2/1LXXX.X0	00347400	
	SPACE 3		00347500	
5	TEXT 19	0X494,2/XXXX	0X519,2/XXXX	00347600
	0X569,2/2LXXX.XX0	0X544,2/2LXXX.XX0	00347700	
77	TEXT 0X619,2/1LXXX.X0	0X594,2/1LXXX.X0	00347800	
	SPACE 3		00347900	
5	TEXT 20	0X495,2/XXXX	0X520,2/XXXX	00348000
	0X570,2/2LXXX.XX0	0X545,2/2LXXX.XX0	00348100	
77	TEXT 0X620,2/1LXXX.X0	0X595,2/1LXXX.X0	00348200	
	SPACE 3		00348300	
5	TEXT 21	0X496,2/XXXX	0X521,2/XXXX	00348400
	0X571,2/2LXXX.XX0	0X546,2/2LXXX.XX0	00348500	
77	TEXT 0X621,2/1LXXX.X0	0X596,2/1LXXX.X0	00348600	
	SPACE 3		00348700	
5	TEXT 22	0X497,2/XXXX	0X522,2/XXXX	00348800
	0X572,2/2LXXX.XX0	0X547,2/2LXXX.XX0	00348900	
77	TEXT 0X622,2/1LXXX.X0	0X597,2/1LXXX.X0	00349000	
	SPACE 2		00349100	
5	TEXT 23	0X498,2/XXXX	0X523,2/XXXX	00349200
	0X573,2/2LXXX.XX0	0X548,2/2LXXX.XX0	00349300	
77	TEXT 0X623,2/1LXXX.X0	0X598,2/1LXXX.X0	00349400	

	SPACE	3				00349500
5	TEXT	24	0X499,2/XXXX	0X524,2/XXXX		00349600
	TEXT		0X574,2/2LXXX,XX	0X549,2/2LXXX,XX		00349700
77	TEXT		0X624,2/1LXXX,XX	0X599,2/1LXXX,XX		00349800
	SPACE	1				00349900
16	TEXT					00350000

	TEXT	MONTHLY				00350100
4	TEXT	TOTAL	0X500,2/XXXX	0X525,2/XXXX		00350200
4	TEXT		0X575,2/2LXXX,XX	0X550,2/2LXXX,XX		00350300
77	TEXT		0X625,2/1LXXX,XX	0X600,2/1LXXX,XX		00350400
	OBJECT					00350500
	SPACE	3				00350600
10	TEXT		MONTHLY AIRCRAFT			00350700
	SPACE	1				00350800
10	TEXT		CHARACTERISTICS			00350900
	SPACE	2				00351000
4	TEXT	AIRCRAFT	DIRECT	NOT	NOT	00351100
	TEXT	AVAILABILITY				00351200
4	TEXT	TALE	MAINT. MAN	OPERATIONALLY	OPERATIONA	00351300
LLN	TEXT					00351400
4	TEXT	NUMBERS	DOJRS PER	READY-	READY-	00351500
	JD TIME/	MISSIONS PLDOW/	MISSIONS COMP/			00351600
4	TEXT	PLIGHT MR.	MAINTENANCE	SUPPLY		00351700
	TOTAL TIME	MISSIONS CALLED	MISSIONS CALLED			00351800

	SPACE	2				00351900
5	TEXT	1	0X626,2/2LXX,XX	0X651,2/1LXXXX,		00352000
X0	TEXT		0X1401,2/1LXXX,XX	0X676,2/2LXX,XX		00352100
76	TEXT		0X701,2/2LXXX,XX	0X726,2/2LXXX,XX		00352200
	SPACE	2				00352300
5	TEXT	2	0X627,2/2LXX,XX	0X652,2/1LXXXX,		00352400
X0	TEXT		0X1402,2/1LXXX,XX	0X677,2/2LXX,XX		00352500
76	TEXT		0X702,2/2LXXX,XX	0X727,2/2LXXX,XX		00352600
	SPACE	2				00352700
5	TEXT	3	0X628,2/2LXX,XX	0X653,2/1LXXXX,		00352800
X0	TEXT		0X1403,2/1LXXX,XX	0X678,2/2LXX,XX		00352900
76	TEXT		0X703,2/2LXXX,XX	0X728,2/2LXXX,XX		00353000
	SPACE	2				00353100
5	TEXT	4	0X629,2/2LXX,XX	0X654,2/1LXXXX,		00353200
X0	TEXT		0X1404,2/1LXXX,XX	0X679,2/2LXX,XX		00353300
76	TEXT		0X704,2/2LXXX,XX	0X729,2/2LXXX,XX		00353400
	SPACE	2				00353500
5	TEXT	5	0X630,2/2LXX,XX	0X655,2/1LXXXX,		00353600
X0	TEXT		0X1405,2/1LXXX,XX	0X680,2/2LXX,XX		00353700
76	TEXT		0X705,2/2LXXX,XX	0X730,2/2LXXX,XX		00353800
	SPACE	2				00353900
5	TEXT	6	0X631,2/2LXX,XX	0X656,2/1LXXXX,		00354000
X0	TEXT		0X1406,2/1LXXX,XX	0X681,2/2LXX,XX		00354100

76	TEXT	0X704,2/2LXXX,XX0	0X731,2/2LXXX,XX0	01344600
	SPACE	2		01344700
5	TEXT	7	0X632,2/2LXX,XX0	0X657,2/1LXXXX,00354400
X0	TEXT	0X1407,2/1LXXX,XX0	0X652,2/2LXX,XX0	01344900
76	TEXT	0X707,2/2LXXX,XX0	0X732,2/2LXXX,XX0	01345000
	SPACE	2		01345100
5	TEXT	9	0X633,2/2LXX,XX0	0X658,2/1LXXXX,00345200
X0	TEXT	0X1409,2/1LXXX,XX0	0X653,2/2LXX,XX0	01345300
76	TEXT	0X709,2/2LXXX,XX0	0X733,2/2LXXX,XX0	01345400
	SPACE	2		01345500
5	TEXT	9	0X634,2/2LXX,XX0	0X659,2/1LXXXX,00345600
X0	TEXT	0X1409,2/1LXXX,XX0	0X654,2/2LXX,XX0	01345700
76	TEXT	0X709,2/2LXXX,XX0	0X734,2/2LXXX,XX0	01345800
	SPACE	2		01345900
5	TEXT	10	0X635,2/2LXX,XX0	0X660,2/1LXXXX,00345A00
X0	TEXT	0X1410,2/1LXXX,XX0	0X655,2/2LXX,XX0	01346100
76	TEXT	0X710,2/2LXXX,XX0	0X735,2/2LXXX,XX0	01346200
	SPACE	2		01346300
5	TEXT	11	0X636,2/2LXX,XX0	0X661,2/1LXXXX,00346400
X0	TEXT	0X1411,2/1LXXX,XX0	0X656,2/2LXX,XX0	01346500
76	TEXT	0X711,2/2LXXX,XX0	0X736,2/2LXXX,XX0	01346600
	SPACE	2		01346700
5	TEXT	12	0X637,2/2LXX,XX0	0X662,2/1LXXXX,00346800
X0	TEXT	0X1412,2/1LXXX,XX0	0X657,2/2LXX,XX0	01346900
76	TEXT	0X712,2/2LXXX,XX0	0X737,2/2LXXX,XX0	01347000
	SPACE	2		01347100
5	TEXT	13	0X638,2/2LXX,XX0	0X663,2/1LXXXX,00347200
X0	TEXT	0X1413,2/1LXXX,XX0	0X658,2/2LXX,XX0	01347300
76	TEXT	0X713,2/2LXXX,XX0	0X738,2/2LXXX,XX0	01347400
	SPACE	2		01347500
5	TEXT	14	0X639,2/2LXX,XX0	0X664,2/1LXXXX,00347600
X0	TEXT	0X1414,2/1LXXX,XX0	0X659,2/2LXX,XX0	01347700
76	TEXT	0X714,2/2LXXX,XX0	0X739,2/2LXXX,XX0	01347800
	SPACE	2		01347900
5	TEXT	15	0X640,2/2LXX,XX0	0X665,2/1LXXXX,00348000
X0	TEXT	0X1415,2/1LXXX,XX0	0X660,2/2LXX,XX0	01348100
76	TEXT	0X715,2/2LXXX,XX0	0X740,2/2LXXX,XX0	01348200
	SPACE	2		01348300
5	TEXT	16	0X641,2/2LXX,XX0	0X666,2/1LXXXX,00348400
X0	TEXT	0X1416,2/1LXXX,XX0	0X661,2/2LXX,XX0	01348500
76	TEXT	0X716,2/2LXXX,XX0	0X741,2/2LXXX,XX0	01348600
	SPACE	2		01348700
5	TEXT	17	0X642,2/2LXX,XX0	0X667,2/1LXXXX,00348800
X0	TEXT	0X1417,2/1LXXX,XX0	0X662,2/2LXX,XX0	01348900
76	TEXT	0X717,2/2LXXX,XX0	0X742,2/2LXXX,XX0	01349000
	SPACE	2		01349100
5	TEXT	19	0X643,2/2LXX,XX0	0X668,2/1LXXXX,00349200
X0	TEXT	0X1419,2/1LXXX,XX0	0X663,2/2LXX,XX0	01349300
76	TEXT	0X719,2/2LXXX,XX0	0X743,2/2LXXX,XX0	01349400
	SPACE	2		01349500
5	TEXT	19	0X644,2/2LXX,XX0	0X669,2/1LXXXX,00349600
X0	TEXT	0X1419,2/1LXXX,XX0	0X664,2/2LXX,XX0	01349700

76	TEXT	#X719,2/2LXXX,XX#	#X746,2/2LXXX,XX#	01350000
	SPACE	2		00350000
5	TEXT	20	#X695,2/2LXX,XX#	#X670,2/1LXXXX,00350000
X#		#X1420,2/1LXXX,XX#	#X695,2/2LXX,XX#	00350100
76	TEXT	#X720,2/2LXXX,XX#	#X745,2/2LXXX,XX#	00350200
	SPACE	2		00350300
5	TEXT	21	#X696,2/2LXX,XX#	#X671,2/1LXXXX,00350400
X#		#X1421,2/1LXXX,XX#	#X696,2/2LXX,XX#	00350500
76	TEXT	#X721,2/2LXXX,XX#	#X746,2/2LXXX,XX#	00350600
	SPACE	2		00350700
5	TEXT	22	#X697,2/2LXX,XX#	#X672,2/1LXXXX,00350800
X#		#X1422,2/1LXXX,XX#	#X697,2/2LXX,XX#	00350900
76	TEXT	#X722,2/2LXXX,XX#	#X747,2/2LXXX,XX#	00351000
	SPACE	2		00351100
5	TEXT	23	#X698,2/2LXX,XX#	#X673,2/1LXXXX,00351200
X#		#X1423,2/1LXXX,XX#	#X698,2/2LXX,XX#	00351300
76	TEXT	#X723,2/2LXXX,XX#	#X748,2/2LXXX,XX#	00351400
	SPACE	2		00351500
5	TEXT	24	#X699,2/2LXX,XX#	#X674,2/1LXXXX,00351600
X#		#X1424,2/1LXXX,XX#	#X699,2/2LXX,XX#	00351700
76	TEXT	#X724,2/2LXXX,XX#	#X749,2/2LXXX,XX#	00351800
16	TEXT	-----		00351900
				00352000
4	TEXT	MONTHLY		00352100
4	TEXT	TOTAL	#X650,2/2LXX,XX#	#X675,2/1LXXXX,00352200
X#		#X1425,2/1LXXXX,XX#	#X700,2/2LXX,XX#	00352300
77	TEXT	#X725,2/2LXX,XX#	#X750,2/2LXX,XX#	00352400
	OBJECT			00352500
	SPACE	3		00352600
30	TEXT	MONTHLY PLATOON STATISTICS		00352700
	SPACE	3		00352800
18	TEXT	TOTAL FLYING HOURS DURING THE MONTH	#X163,2/1LX#	00352900
XX,XX				00353000
	SPACE	2		00353100
19	TEXT	FLYING HOURS-COMPLETED MISSIONS	#X275,2/1LX#	00353200
XX,XX				00353300
	SPACE	1		00353400
19	TEXT	FLYING HOURS-ABORTED MISSIONS	#X1475,2/1L#	00353500
XX,XX				00353600
	SPACE	1		00353700
19	TEXT	FLYING HOURS-TEST HOPS	#X800,2/1LX#	00353800
XX,XX				00353900
	SPACE	3		00354000
19	TEXT	THE SERVICE PLATOON PERFORMED #X176,2/XXXX ON AIRCRAFT		00354100
7	TEXT	REPAIRS THIS MONTH.		00354200
	SPACE	2		00354300
19	TEXT	THE SERVICE PLATOON ALSO REMOVED AND REPLACED #X175,2#		00354400
/XXXX	TEXT	PARTS ON THE AIRCRAFT.		00354500
	SPACE	2		00354600
19	TEXT	#X177,2/XXXX OF THE PARTS REMOVED AND REPLACED WERE R#		00354700
REPAIRED	TEXT	AT THE ORGANIZATIONAL LEVEL		00354800

IS	SPACE	2		00344000
L	TEXT		0X179,2/XXXX WERE REPAIRED AT THE DIRECT SUPPORT LEVEL	00345000
	SPACE	2		00345100
IS	TEXT		0X179,2/XXXX OF THE PARTS WERE REPAIRED AT THE GENERAL	00345200
L	SUPPORT LEVEL			00345300
	SPACE	2		00345400
IS	TEXT		THERE WERE 0X180,2/XXXX PARTS RETURNED TO THE DEPOT IN	00345500
N	THE WATS CATEGORY.			00345600
	SPACE	2		00345700
IS	TEXT		THERE WERE ALSO 0X181,2/XXXX PARTS THAT WERE CONDEMNED	00345800
D.				00345900
	SPACE	2		00346000
IS	TEXT		0X182,2/XXXX PARTS WERE DETERMINED TO BE FALSE ALARMS	00346100
	OUTPUT			00346200
	END			00346300
				00346400

LIST OF SYMBOLS AND ABBREVIATIONS

A/C	Aircraft
ATC	Advanced Technology Component
CONUS	Continental United States
CPU	Central Processing Unit
EMT	Elapsed Maintenance Time
F/H	Flight Hour
FAIL RATE	Failure Rate
FIRM	Flight Inspection Requirements Minimum
GPSS	General Purpose System Simulation
GSE	Ground Support Equipment
HLH	Heavy Lift Helicopter
I.O.M.	Index of Merit
MA	Maintenance Action
MAINT. CONC.	Maintenance Concept
MALF/FH	Malfunctions per Flight Hour
MEA	Maintenance Engineering Analysis
MMH	Maintenance Man-hour
MMH/FH	Maintenance Man-hour per Flight Hour
MTBMA	Mean Time Between Maintenance Actions
MTTR	Mean Time to Repair
NORM	Not Operationally Ready - Maintenance
NORS	Not Operationally Ready - Supply
NRTS	Not Repairable This Station
O&M	Operations and Maintenance
PMD	Preventive Maintenance Daily

PMI	Preventive Maintenance Intermediate
PMP	Preventive Maintenance Periodic
PPI	Phased Periodic Inspection
Q	Queue
R&M	Reliability and Maintainability
S	Standard deviation of a normal distribution
TBO	Time Between Overhaul
TOE	Table of Organization and Equipment
UTIL	Utilization
WUC	Work Unit Code
$\bar{X}$	Mean of a normal distribution

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