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CH-54 OPERATIONAL STATISTICS

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Prepared for

EUSTIS DIRECTORATE
U. S. ARMY AIR MOBILITY RESEARCH AND DEVELOPMENT LABORATORY
Fort Eustis, Va. 23604

EUSTIS DIRECTORATE POSITION STATEMENT

The CH-54 helicopter has been validated in the Army Reliability and Maintainability (R&M) Model. A factorial analysis was used to design a set of simulation experiments to determine model sensitivity, credibility, and sufficiency. Changes in operational availability resulting from changes in TBO policy, major inspection policies, failure rates, Not Operationally Ready Supply (NORS) rates, and utilization rates were consistent with actual data from the field.

The conclusions contained herein are concurred in by this Directorate.

The technical monitors for this contract were Mr. Howard M. Bratt, Mr. Robert L. Walker, and Mr. Gary R. Newport, Military Operations Technology Division, Eustis Directorate.

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The purpose of the CH-54 Operational Statistics program was to validate the CH-54 helicopter in the Army's tactical aircraft reliability and maintainability model and to analyze the results obtained from the factorially designed arrangement of simulation runs on sensitivity, credibility, and sufficiency. Changes in utilization, failure rate, NORS waiting time

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TBO concepts, major inspection durations, and repair/replacement time distributions were studied. Effects on operational availability, intrinsic availability, unscheduled elapsed maintenance downtime (including and excluding NORS time), and mission accomplishment were evaluated.

A baseline model was established by making successive simulation iterations and refinements until all output statistics tested fell within the allowable statistical range of the expected CH-54B R&M characteristics and operational conditions.

Among the major findings of this program were:

a) Simulation error was very large, but could be reduced substantially by employing a factorial arrangement of simulation runs.
b) Simulation error could be further reduced if the model's logic were changed in the method of simulating failures.
c) Despite the large simulation error, sensitivities were able to be established for most parameters studied. Low utilization for the number of aircraft simulated was probably the primary cause for little or no change in mission accomplishment.
d) Types of repair/replacement distribution assumed do not alter the simulation results, provided the mean time to repair/replace value is correct.
e) Short-term scheduled maintenance requirements of 30 hours between major inspections as opposed to longer term "periodic" scheduled maintenance of 100 hours show indications of compromising operational availability and maintenance man-hour resources.

The study results were substantiated on a rigorous statistical basis.

SUMMARY

The CH-54 Operational Statistics program was performed under Contract DAAJ02-74-C-0064 for the purpose of validating the CH-54 helicopter in the Army's tactical aircraft Reliability and Maintainability (R&M) model and to analyze the results obtained from the factorically designed arrangement of R&M simulation runs on sensitivity, credibility, sufficiency and application regimes.

The NORS and cannibalization subroutine was employed using CH-54B field data gathered through the ORME[1] program and the subroutine was exercised throughout the study effort. The studies showed that employment of the NORS and cannibalization subroutine used in conjunction with an 8 hour a day, 5 days a week peacetime utilization introduces very large variation into the model. As a consequence, simulations covering a company unit operating period of 18 months were required to minimize this variability.

The CH-54 program provides a new dimension into the study of simulation results in that it provides a statistical methodology for the acceptance or rejection of simulation results as sufficiently representative of known field flight operations and for the determination of significant simulation results.

A baseline model was established by making successive simulation iterations and model refinements until all output statistics tested fell within allowable statistics limits of the expected R&M characteristics and operational conditions of the CH-54B. Having established the baseline, changes in utilization, failure rate, NORS waiting time, TBO concepts, major inspection durations and repair/replacement time distributions were studied.

Significant results found during this study were:

1) The simulation error associated with the operational availability model output is very large and hampers the ability of the model to measure the effects of major changes in Reliability and Maintainability aircraft characteristics.

2) Despite the large simulation error, the model generally provides the expected results, for example, increasing either utilization, failure rate or NORS waiting time by 20% produced about the same

Note (1): The ORME program which was completed in mid 1974 was a U. S. Army-Sikorsky Operational Reliability/Maintainability Program established to collect and evaluate CH-54 R/M field data by trained R/M engineering personnel. Its purpose was to construct accurate and timely data profiles of failure and maintenance problems observed under monitored operational conditions and establish failure trends in order to intensify R/M improvement in current and future helicopter designs.

net effect, i.e., that of decreasing operational availability by 5%. A notable exception of this was found in attempting to measure the effect on mission accomplishment where the simulation error totally masked any cause/effect relationship induced by increasing NORS, failure rate, and utilization. Low utilization for the number of aircraft simulated appeared to play a most significant part in causing little or no change in mission accomplishment.

3) The ability to measure changes in operational response was enhanced by the use of the factorial analysis procedures in the study. The use of the factorial approach in this study not only minimized the influence of simulation error which threatened to cloud the determination of real changes in model output, but also substantially reduced the number of simulation runs required to perform the analysis. In many cases this reduction in runs was by a factor of 3 to 1.

The simulation error of this model is large and the number of iterative simulation runs required to establish the validity of the model and to perform sensitivity studies was excessive despite the mollifying influence of the factorial approach. A method is recommended for minimizing the simulation error of the R/M model which will have the combined effect of reducing the number of iterative runs required and improving the sensitivity of the model. This recommendation involves a change in the method of simulating failures according to "when discovered" events.

PREFACE

The work for this study was authorized by Contract DAAJ02-74-C-0064 by the Eustis Directorate, U. S. Army Air Mobility Research and Development Laboratory, Fort Eustis, Virginia, under the technical cognizance of Mr. Howard Bratt, Mr. Gary Newport and Mr. Robert Walker.

The Sikorsky Aircraft personnel involved in performing and contributing to this study were:

Mr. A. A. Wolf, Supervisor of Reliability and Maintainability

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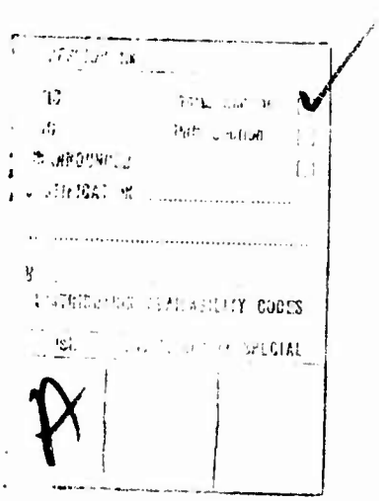
Mr. J. V. Stern, Computer Programmer

Mr. N. T. Spencer, CH-54 Field Reliability Engineer

Mr. C. D. Holbert, Maintainability Engineer

Mr. J. K. Bosse, Computer Programmer



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INTRODUCTION

This program was undertaken to validate the Army R&M model for use in simulating CH-54B operation. A secondary but equally important purpose was to incorporate some statistical rigor into the measurement and interpretation of the simulation results.

The information collected and analyzed during this program is presented in the following seven sections:

(1) CH-54B Aircraft Description

(2) CH-54B Aircraft Operation

(3) R&M Model Data Input for CH-54B

(4) R&M Model Program Updates to Accommodate the CH-54B Aircraft/Operation

(5) Validation of the CH-54B Version of the R&M Model

(6) Statistical Analysis of Simulation Results

(7) Conclusions and Recommendations

The CH-54B field experience used in constructing the CH-54B version of the R&M model was primarily taken from the Operations Reliability/Maintainability Engineering (ORME) program. This was an Army/Sikorsky data collection and product improvement program which included 3 years of CH-54B operation by 25 aircraft. The ORME program provided the expected values used in the CH-54B/R&M model validation.

The sensitivity studies were based on varying certain aircraft and operational factors in a factorial design arrangement to improve the statistical interpretation of the simulation results. The methods of varying these factors were optional in some cases. In the case of utilization, this change was produced by varying the number of mission launches per day as opposed to varying the number of aircraft required for a mission or the mission duration. The NORS factor was varied by changing the delay time to acquire a spare rather than changing the probability that a spare part was needed but not available.

DISCUSSION

The CH-54B model is a modification of the UH-1N R&M simulation model which was supplied to Sikorsky Aircraft by the Eustis Directorate. The first part of this discussion describes the CH-54B aircraft characteristics and CH-54B operational environment that are being simulated. As part of the aircraft description, Appendix I is provided to identify the elements of the CH-54B and their failure rates. Following this information is a discussion describing the specific input and model logic changes incorporated into the original UH-1N R&M model to construct the CH-54B model. Appendixes II, III, and IV further identify these modifications. The last part of this discussion describes the CH-54B model validation effort and a statistical analysis of the simulation results of running the model under a variety of alternative operating conditions and maintenance concepts, and the conclusions and results derived therefrom. Appendix V provides additional detail on the factorially designed statistical analysis performed in this program. Figure 1 illustrates the input, constraints and output that are essential to the CH-54B model described herein.

CH-54B AIRCRAFT DESCRIPTION

The CH-54B is a crane-type, 40,000-lb category helicopter. It has been used extensively in Southeast Asia to move heavy Army equipment and to retrieve downed aircraft. The operation simulated in this program, however, is peacetime, state-side operation.

For the purposes of the R&M model input function structure for failure, repair, and replace information, the CH-54B has been identified according to the following subsystem/component breakdown, which has been described as consisting of 20 subsystems comprising a total of 296 components. The categories of main and tail rotor blades, engines and fuel controls are represented by more than one component element to permit tracking each blade, etc., individually for monitoring their scheduled TBO removal times. The system codes to be used in describing the 20 subsystems and their components are consistent with those used in the Operational Reliability/ Maintainability Engineering (ORME) program and are identified below.

Subsystem	Subsystem Code	Components Elements
Airframe	01	01-20
Landing Gear	02	01-24
Mechanical Flight Controls	03	01-13
Rotors/Blades	04	01-32
APP Installation	05	01-08
Transmission	06	01-23
Power Plant Installation	07	01-22
Heater/Anti-Ice	08	01-05
Electrical	09	01-16
Hydraulic Flight Controls	10	01-11
Hydraulics	11	01-13
Fuel System	12	01-05
Utilities	13	01-08

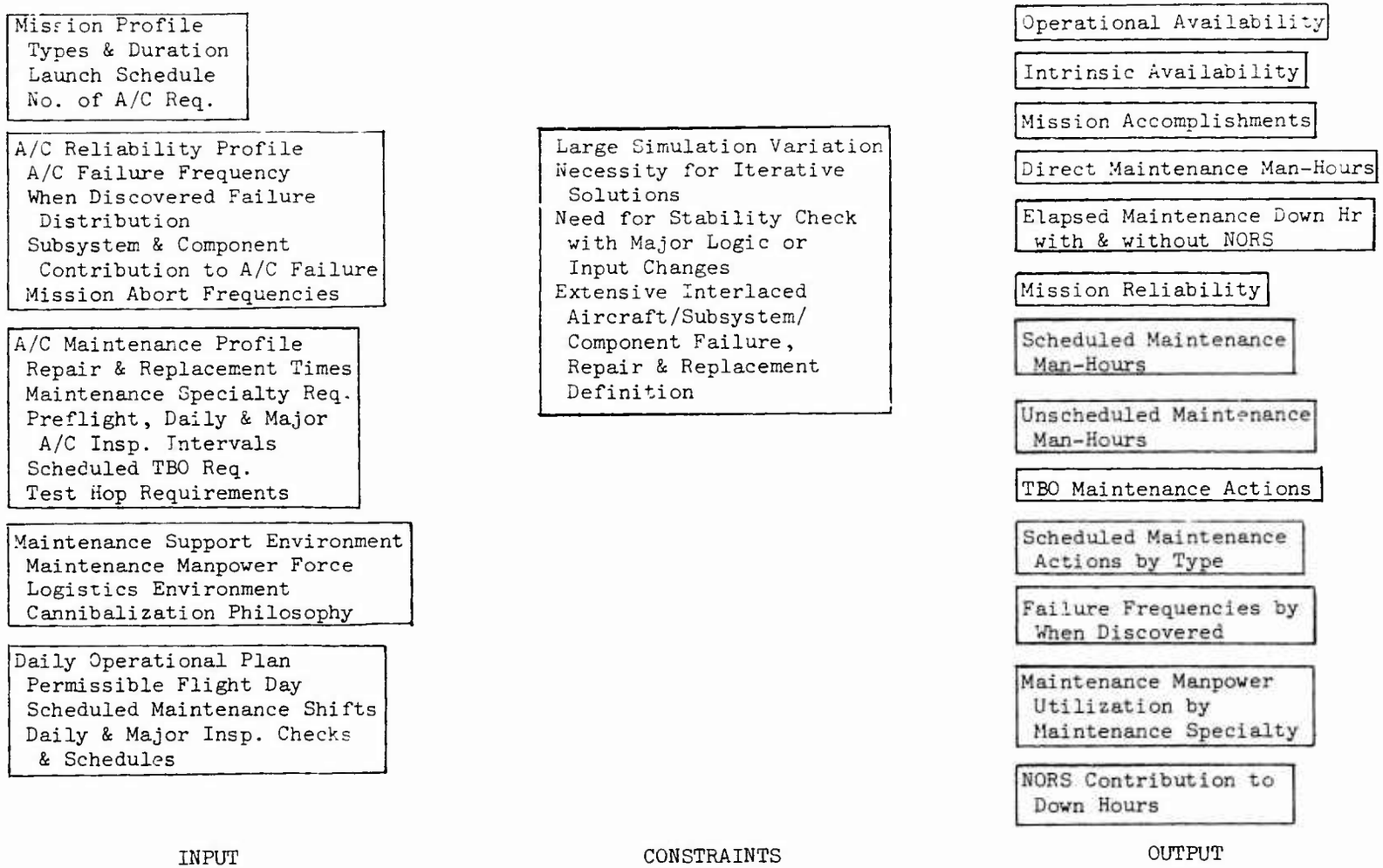

Figure 1. CH-54B Model Input/Output Description.

Subsystem	Subsystem Code	Components Elements
Cargo Handling	14	01-11
Instruments	15	01-26
AFCS	16	01-15
Communications	17	01-14
Navigation	18	01-07
Turboshaft Engine	19	01-15
APP	20	01-08

The individual component identifications and the failure rates observed in the field relative to the components identified are contained in Appendix I. This information was taken from the ORME program and is representative of the 3-year history reported in SER-64344, Revision K.(1) The time change components, as identified in the CH-54B Organizational Maintenance Manual, TM 55-1520-217-20-2, are shown below with their high time removal limits.

Components	Number of Items	TBO (Hr)
Main Rotor Head	1	800
Tail Rotor Head	1	800
Main Rotor Blade	6	2500
Tail Rotor Blade	4	1600
Main Gearbox	1	625
Intermediate Gearbox	1	1200
Tail Gearbox	1	1200
AFCS Servo Assembly	1	1200
Fuel Control	2	800
Engine	2	800
Cargo Hoist	1	240(2)

CH-54B AIRCRAFT OPERATION

The CH-54B baseline operation is comprised of the following information.

- CH-54B Company Unit = 9 aircraft
- Operational Week = 5 Days
- Operational Day = 8:30 a.m. to 4:30 p.m.
- Number of Standby Aircraft = 1 (of the 9) aircraft
- Number of Holidays and General Inspection Nonflying Days = 18 Days per year
- Flight Hours for a 9-A/C Company Unit for 18 Months (28 Days/Month)= 2394 Hr, 1596 FH/Year, 14.8 FH/AC/Month
- Operational Availability = 54.5%

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(1) Geffert, G., and Holbert, C., Operations Reliability/Maintainability Engineering Program Quarterly Evaluation Report, Sikorsky Aircraft, SER-64344, Rev. K, May 15, 1974.

(2) Since the cargo hoist is used for no more than 10% of the missions, the simulation model input actually reflects 240/.1 = 2400 hours.

The company unit maintenance force used in the baseline operation is as follows:

Maintenance Specialist	MOS	No. Per Company Unit
a) A/C Maintenance Tech.	671C0	2
b) Helicopter Repairman	67x20	37
c) Electrician	67F20	2
d) Avionics Mechanic	35K20	3
e) Airframe Repairman	68G20	1
f) Engine Repairman	68B20	2
g) Tech. Inspector	67x30	2
h) Hydraulic Repairman	68H20	2
i) Power Train Repairman	68D20	1
j) Flight Engineer	67x2F	9

To provide a realistic distribution of failures for the various operational events for the baseline, information was taken from the CH-54 ORME program. Specifically the information was taken from the ORME Discrepancy/Corrective Action Reports. "When discovered" data and, in the case of in-flight aborts, the effect on mission data from these reports were used. The relationship between the data as collected through the ORME "when discovered" codes and the R&M model's operational events is shown below. In the cases of special inspections, acceptance inspections, transfer inspections and "on ground - not covered by above" actions, some engineering judgement was required to appropriately enter this data into the model. These judgements are indicated below and were made based on discussions with Sikorsky ORME reliability engineers and with the manager of the ORME program.

Relationship of ORME Data to R&M Model Requirements

ORME	R&M MODEL
Exterior & Interior Checks	1. Preflight
APP Start to Takeoff	2. In-Flight
In-Flight	3. In-Flight Aborts (as further determined by "effects on mission" code)
On Ground to Eng. Shutdown	
Daily Inspection	4. Daily Inspection
Intermediate Inspection	5. Intermediate Inspection
Periodic Inspection	6. Periodic Inspection
Special Inspection	Prorated over 1, 4, 5, and 6 above
Acceptance Inspection(3)	Not Included
Transfer Inspection(3)	Not Included
On Ground - not covered by above	Prorated over 1, 4, 5, and 6 above

Table I shows the number of observed M.A.'s in the 9172 CH-54B flight hours (including those M.A.'s prorated) and the resulting system by system cumulative probability distribution for each aircraft operational event.

(3) M.A.'s discovered during acceptance and transfer inspections together accounted for only .6% of the total M.A.'s and were not included since they occurred before, or were found after, the normal operation/maintenance cycle of the CH-54.

TABLE I. SYSTEM/EVENT MAINTENANCE ACTION DISTRIBUTION

Event / System	Preflight MA's	Preflight Cum. Prob.	In-Flight MA's	In-Flight Cum. Prob.	In-Flt. Abort MA's	In-Flt. Abort Cum. Prob.	Daily MA's	Daily Cum. Prob.	Intermediate Insp. MA's	Intermediate Insp. Cum. Prob.	Periodic Insp. MA's	Periodic Insp. Cum. Prob.
01	23.2	.0824	13	.0087	2	.0210	50.2	.0453	13.1	.0645	120.5	.1201
02	16	.1392	33	.0307	1	.0270	63.7	.1027	20.2	.1640	115.3	.2350
03	15.3	.1936	18	.0427	-	-	18.6	.1195	23.8	.2812	20	.2549
04	46.1	.3574	50	.0761	13	.1053	151	.2256	32.5	.4413	181.4	.4356
05	4.3	.3727	20	.0895	7	.1475	25.9	.2790	-	-	35.8	.4713
06	36	.5006	123	.1716	23	.2861	155.2	.4189	20.8	.5438	107	.5779
07	12	.5432	119	.2510	20	.4066	146.3	.5508	10.3	.5945	70.5	.6481
08	8.2	.5723	36	.2750	-	-	7.3	.5574	.5	.5970	4	.6521
09	31.2	.6823	87	.3330	-	-	89.6	.6382	11.1	.6517	33.3	.6853
10	1.2	.6866	37	.3577	-	-	8.3	.6457	.2	.6527	13.3	.6986
11	24.8	.7747	87	.4157	25	.5572	94.4	.7308	3.9	.6719	37.9	.7364
12	5.4	.7939	42	.4437	5	.5873	2.9	.7334	10.8	.7251	23.9	.7602
13	4	.8081	33	.4657	7	.6295	13	.7451	.4	.7271	10.6	.7708
14	12.3	.8518	27	.4837	6	.6656	36.5	.7780	2.7	.7404	11.5	.7823
15	17.2	.9129	237	.6419	13	.7439	37.6	.8119	10.5	.7921	76.7	.8587
16	9.4	.9463	208	.7808	11	.8102	11.5	.8223	2.8	.8059	26.3	.8849
17	3.4	.9584	140	.8743	1	.8162	16.1	.8368	1.9	.8153	12.6	.8975
18	.5	.9602	62	.9157	-	-	5.7	.8419	.5	.8178	2.3	.8998
19	5.9	.9812	86	.9731	23	.9548	145.6	.9732	31.9	.9749	85.6	.9851
20	5.1	.9999	40	.9999	9	.9999	29.7	.9999	5.1	.9999	15.1	.9999
Total	281.5		1498.0		166.0		1109.1		203.0		1003.6	

Above data covers CH-54B operation from 1 April 1971 to 31 March 1974 and is based on 9172 aircraft flight hours.

CH-54B/R&M MODEL CHARACTERISTICS

The CH-54B R&M model incorporates an 8 hour a day, 5 day a week, 28 day a month operation. The company unit strength of 9 aircraft has a flight operational requirement of approximately 14.8 flight hours per aircraft per month. Preflight, daily, intermediate, and periodic inspections are required. The average mission duration is 1.9 hours with .7 hours required for test hops. The model is detailed to reflect the failure rates, maintenance manhours to repair and to replace, and the elapsed maintenance times on approximately 300 components. Abort data, probability of the aircraft being not operationally ready, and requirements for test hops are also defined for these components. This information is covered in detail in the two previous sections and in Appendix II.

VALIDATION OF THE CH-54B

The validation of the CH-54B simulation model consists of three essential steps: the establishment of the CH-54B baseline model expected values as determined from ORME data, the evaluation of the simulation error associated with the CH-54B/R&M model, and finally the verification that the model has been revised and refined to agree with the expected values within the allowable tolerance permitted by the simulation error.

Table II contains the expected values for the baseline simulation. These are key field experience statistics collected through the CH-54B ORME program which provide the basis for validating the CH-54B simulation model output values as representative of CH-54B field experience. The information reflected in the table was accumulated over a 36-month period that extended from 1 April 1971 to 31 March 1974. The operational sites monitored were Ft. Eustis, Ft. Sill, Ft. Rucker, and Ft. Wainwright.

The CH-54B ORME program report SER-64344, Revision K, reflected a history of 422,592 total aircraft hours, of which 9171.6 were flight hours. Of the 422,592 hours, 5544 were discounted because they were associated with a downed Alaskan aircraft in which parts were not ordered for its reactivation. Total accountable aircraft hours were, therefore, 422,592 - 5544, or 417,048.

Because of the low CH-54B utilization, i.e., 9171.6 flight hours in 417,048 total hours, or 2.20% utilization, and because of the added simulation variation resulting from the incorporation of not operationally ready due to supply (NORS) and cannibalization data into the CH-54B simulation model, runs simulating 18-month company unit operation were needed to provide sufficiently accurate simulation output statistics for meaningful analysis. The need for the 18-month simulation runs is discussed further in the next section. As a result of the 18-month simulation duration, however, 9 aircraft x 24 hours per day x 28 days per month x 18-months, or 108,864 accountable aircraft hours, were reflected in the simulation runs. This resulted in a 9171.6 flight hour x (108,864/417,048) or a 2394.1 flight hour requirement for the 18-month baseline CH-54B simulation.

Total failure rates and abort rates shown in Table II have been taken from the SER-64344, Revision K, and the failure rate distribution has been derived from the study of the ORME Discrepancy Action Reports. The failure rates include both primary and secondary failures. They specifically exclude corrective maintenance actions found to be needed during acceptance and transfer inspections which account for .6 percent of the total corrective actions observed in CH-54B operation. Cannibalization M.A.'s which are incorporated into the model by way of probability of cannibalization indices and scheduled component replacement actions which are taken care of through the scheduled TBO subroutine are also excluded from these rates. Therefore, the model failure rate descriptions together with the M.A.'s accounted for by the cannibalization and scheduled TBO subroutines approximate 99.4 percent of the total observed CH-54B M.A.'s. The failure rates shown in Table II translate into the following expected number of failures for the various CH-54B operational events, based on the expected 2394 flight hours.

CH-54B Event	Fail. Rate x Flt. Time = Expected Failures
Preflight	.03069F/Hr x 2394 Flt. Hr = 73 Failures
Inflight	.16333F/Hr x 2394 Flt. Hr = 391 Failures
Inflight Abort	.01810F/Hr x 2394 Flt. Hr = 43 Failures
PMI	.02213F/Hr x 2394 Flt. Hr = 53 Failures
Daily	.12093F/Hr x 2394 Flt. Hr = 290 Failures
PMP	.10942F/Hr x 2394 Flt. Hr = 262 Failures

To determine what simulation duration was appropriate for estimating simulation error and for the factorial analysis study, the stability of the output statistics was analyzed over an 18-month period.

Figure 2 shows the convergence of important statistics exhibited by the CH-54B version of the R&M model over the simulation duration. To provide these statistics, two simulation runs were made under identical conditions, except for different random number sequences, and statistics were collected after each 2-month interval for the duration of the 18-month simulation. To highlight the variation of output values as the simulation progressed, the statistical value accumulated to the end of a period was compared with the value reflected at the end of the previous interval, and the percentage of differences was computed and plotted. The values were plotted through the 18th month. The plots were examined first to see whether any systematic error was evident. If the trend lines for the simulation runs reflected values that were consistently plus or consistently minus, then it would be reasonable to conclude that the model has not stabilized and was still seeking its normal long term, average operational condition. Review of this figure shows no evidence of systematic error. Second, the plots were examined to evaluate whether the improved stability of the 18-month statistics was sufficient to warrant the longer simulation running time. The plots showed no profound change in the stability of the statistics after the 10th month. The low CH-54B utilization, however, was known to cause high simulation error which could cloud the true operational characteristics. To obtain a better appreciation of this simulation error, statistical outputs from the two different runs were compared with particular attention paid to

TABLE II. ORME VERIFICATION STATISTICS

CH-54B Operational Data (April '71 to March '74)	Date Source & Value SER-64344 Rev. K	ORME Discrep/ Corr. Act. Rpts.
Total Aircraft Hours (Include 24 Hr a Day, 7 Days a Week Accountability)	417,048 Hr	
Total Active Hours	91,842 Hr	
Total Flight Hours	9,171.6 Hr	
Flight Hours per A/C per Month	14.78 Hr	
Total Failure Rate	.4465 Fail./Hr	
Total Abort Rate	.0181 Abort/Hr	
Failure Rate Distribution		
· Preflight		.03069F/Hr
· Inflight		.16333F/Hr
· Daily		.12093F/Hr
· PMI		.02213F/Hr
· PMP		.10942F/Hr
Number of Flights	5326	
Test Hop Flight Hours (Subcategory of the 9171.6 Flight Hours)	441.2 Hr	
Operating and Ready Hours	227,248 Hr	
Operational Availability = (227,248/417,048) x 100	54.5%	
NORS	86,725 Hr	
NORM	26,613 Hr	

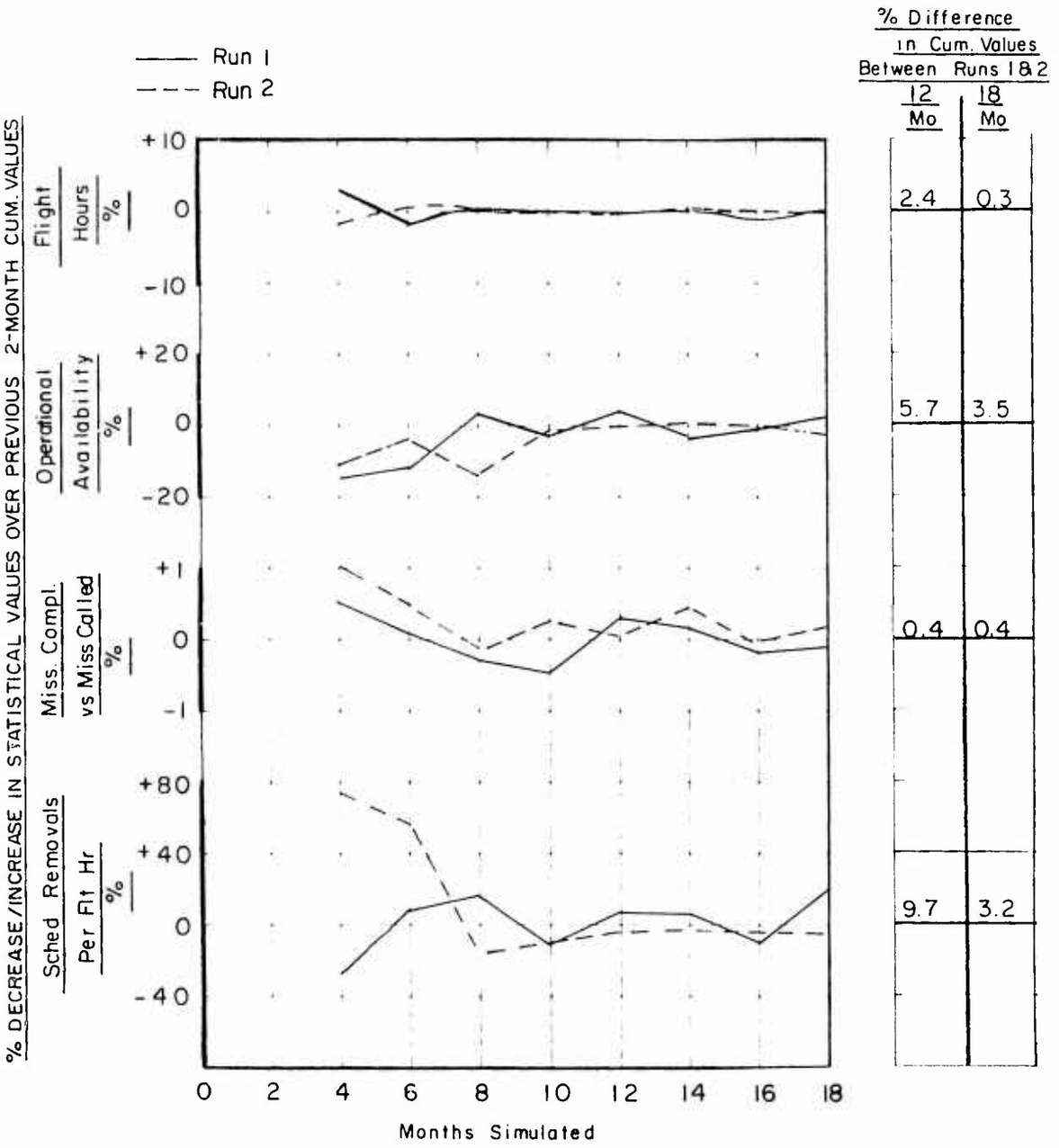

Figure 2. Convergence of CH-54B/R&M Model Output Statistics.

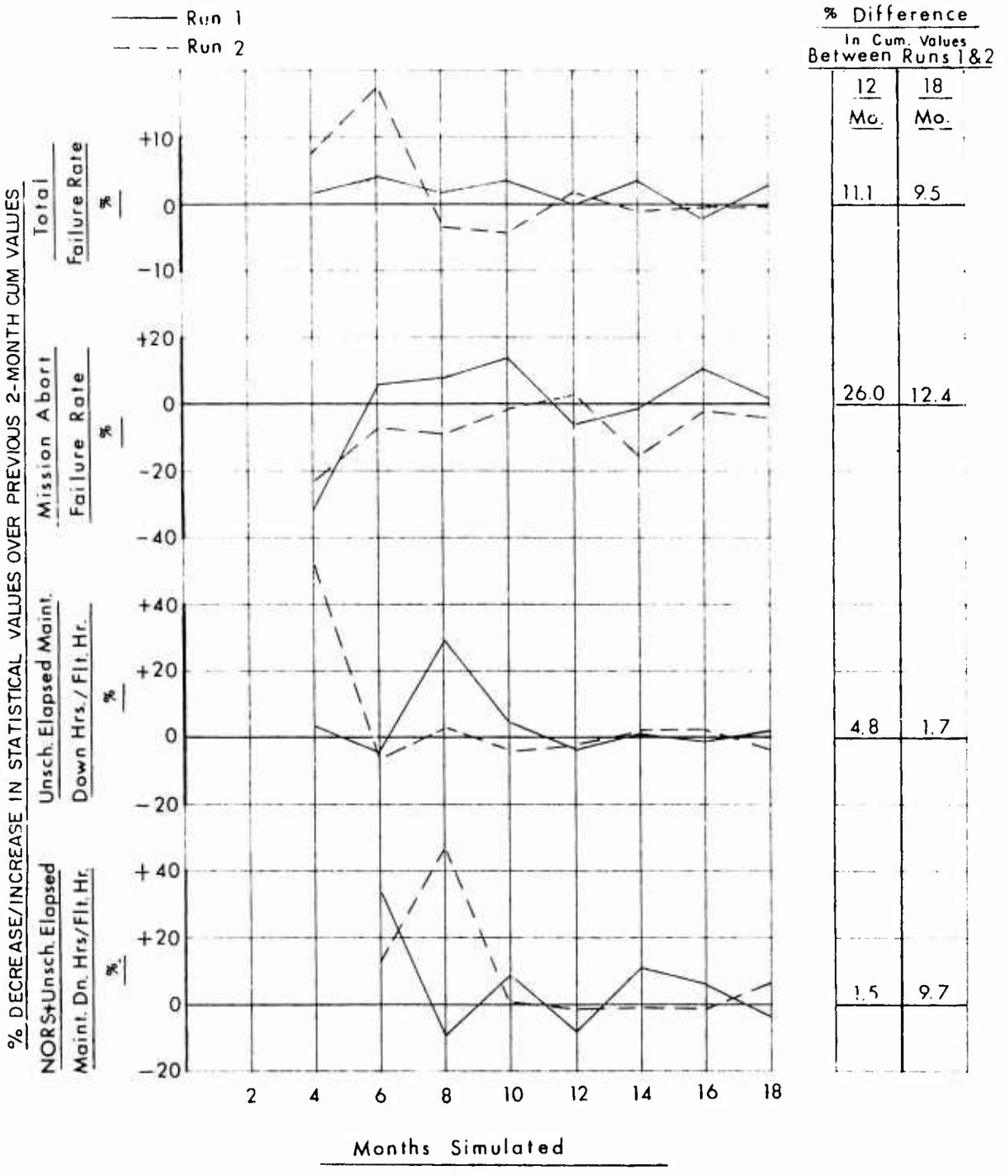

Figure 2. (Continued)

the 10th through 18th month region. Least squares trend lines using the data from the 10th through the 18th month were computed and drawn. The differences in statistical values between the two runs are shown in Figure 3, together with the trend lines. Based on these trend lines, about a 25 percent reduction in scatter between the two runs, when averaged over all eight statistical trends studied, was achieved. Operational availability and mission accomplishment did not exhibit the characteristic improvement, however, the fluctuation of these statistics is such that exceptions to the normal trend will frequently occur. The important fact is that a general improvement in statistical scatter has been achieved by extending the simulated duration to 18 months. Therefore, to help guard against the adverse effects of large variation, the 18-month runs were considered desirable and were used in the subsequent studies.

Table III compares the baseline simulation model statistics with expected baseline values. Four separate 18-month simulation runs were made with the CH-54B baseline model with the random number seed changed. These four runs permitted the evaluation of the error inherent in the simulation model itself. Table III shows the expected values for the subject baseline model and the simulation deviation allowed from the expected values as determined from the four simulation runs referred to above. If the specific simulation run output statistics deviate from the expected values by more than the allowable values, the run is judged to be nonrepresentative of the expected values and further refinement of the model is required. The allowable deviation has been determined on a rigorous statistical basis and conforms to a level of significance criteria of $\alpha = .01$. This means, given that the model is truly representative of the expected values, there is only a 1% chance that a specific simulation statistic will deviate from the expected value by more than the allowable deviation value. Conversely, since this possibility is so remote, if a value does fall outside the allowable limit there is sufficient statistical justification to conclude that the simulation model does not fully represent the expected value and further refinement is required.

After successive simulation iterations and refinements to the model, a baseline model was established in which all output statistics tested fell within the allowable statistical limits; i.e., the resultant model was found to adequately represent the inherent R&M characteristics of the CH-54B when flown in accordance with those operational conditions reflected in the ORME operational data. As indicated above, Table V shows the allowable deviation and the actual difference recorded between the baseline model statistics and the expected values. In all cases these differences were within the allowable deviation, thus giving statistical credibility to the baseline model as adequately representing the expected values.

SENSITIVITY ANALYSES OF THE CH-54B MODEL USING FACTORIAL ANALYSIS APPROACH

Two factorial analyses were selected for study, one having quantitative input levels of utilization, failure rate and not operationally ready due to spares (NORS) varied, and the second having the qualitative factors of major inspection maintenance concepts, elapsed repair/replacement time distributions, and on-condition removals studied.

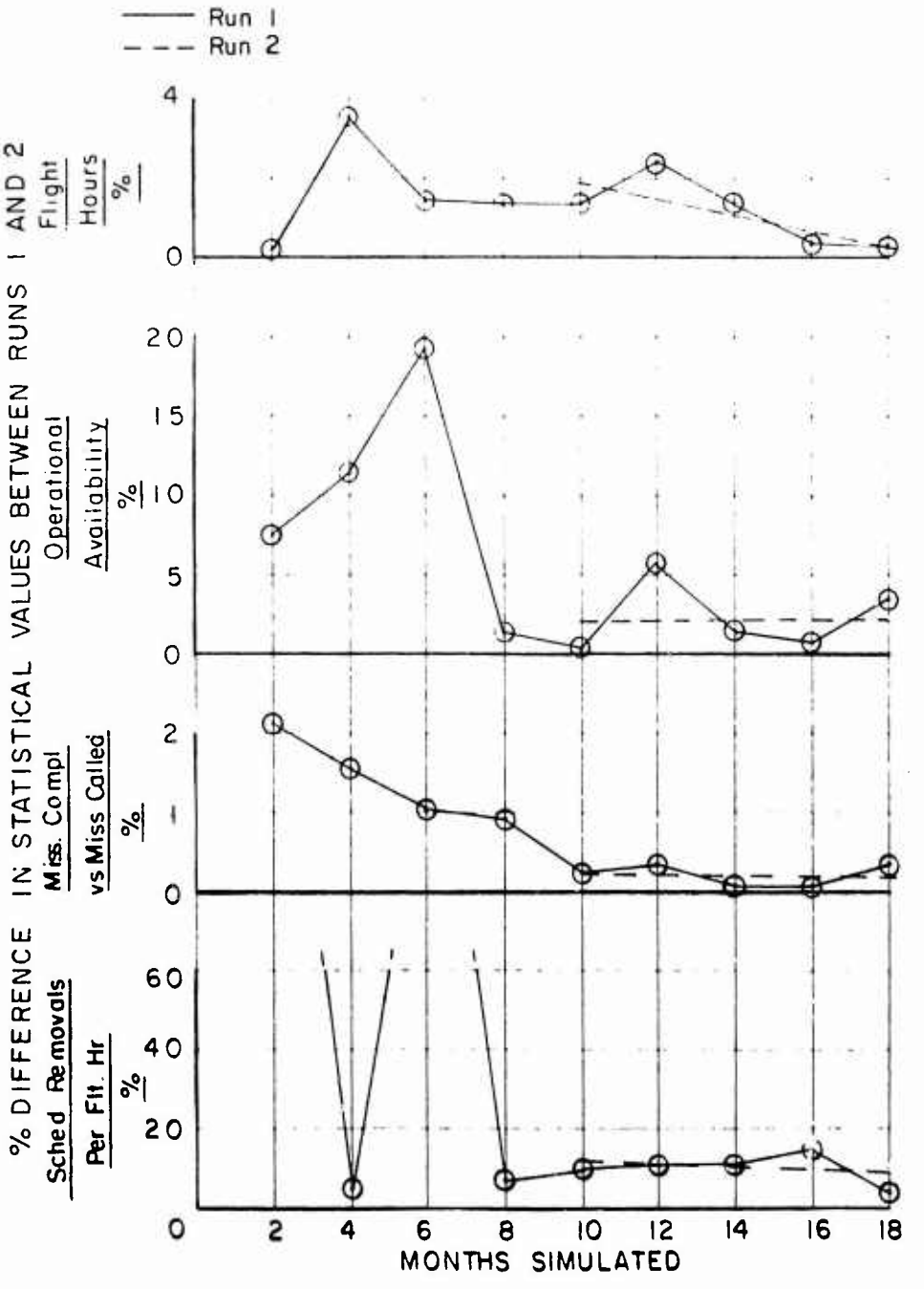

Figure 3. Percentage Difference Between Statistical Output of the Two Stability Runs with Least-Squares Fit.

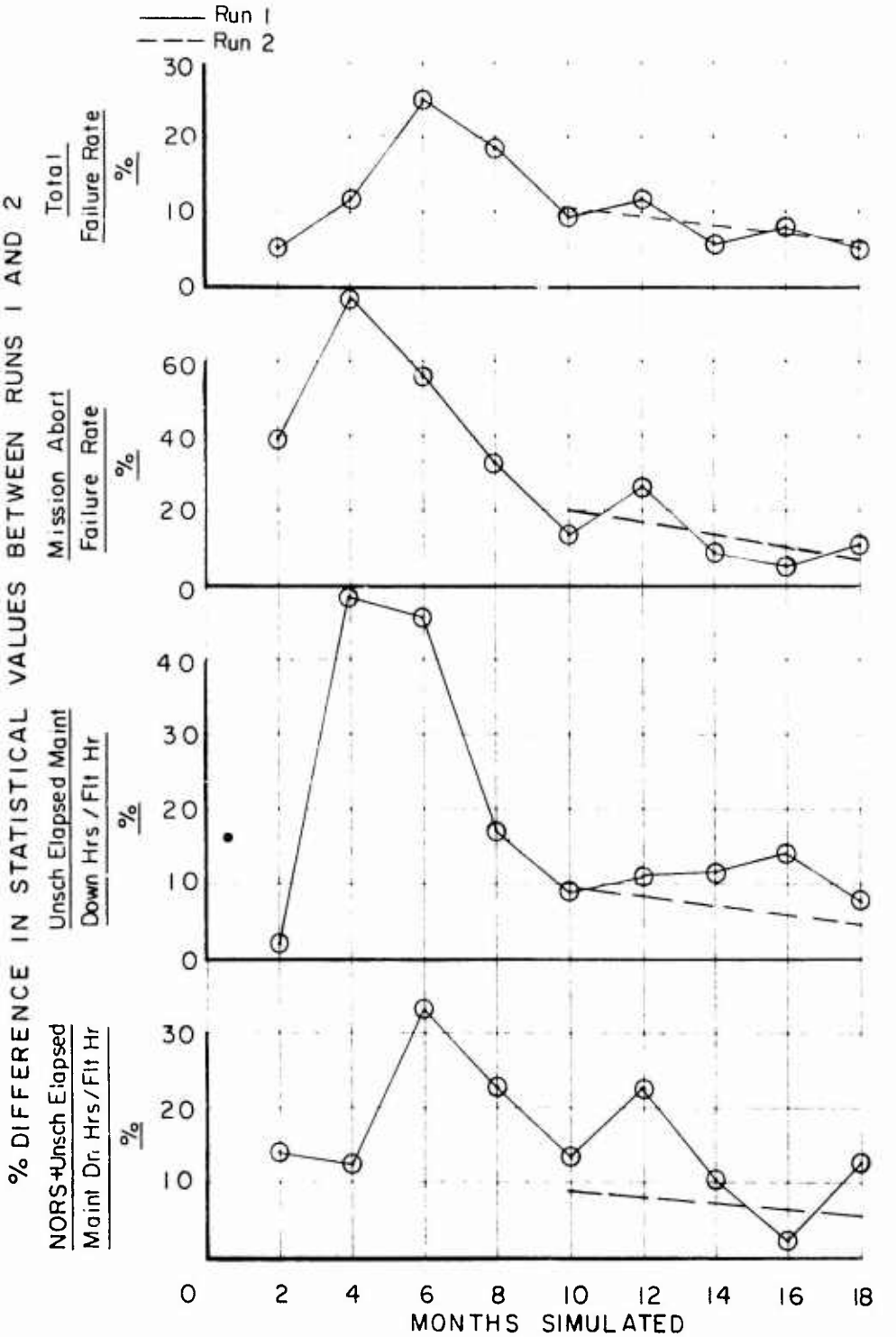

Figure 3. (Continued)

TABLE III. COMPARISON OF BASELINE SIMULATION MODEL STATISTICS WITH EXPECTED BASELINE VALUES

Output Parameter Measured	18-Month Operation		Allowable Error 99% Level	Actual Error
	Baseline Expected Values	Simulation Statistics		
Utilization - Flt. Hr	2394	2380	±37	14
Failure Rate - Fail./Hr	.4465	.4311	±.0438	.0154
Failures	1069	1026	±93	43
Failures by When Discovered				
Preflight	73	83	±22	10
Inflight	391	405	±31	14
Daily Inspection	290	286	±20	4
P&I Inspection	53	43	±10	10
PMP Inspection	262	209	±86	53
Abort Failure Rate - Fail./Hr	.0181	.0172	±.0064	.0009
Abort Failures	43	41	±13	2
Average Flight Duration - Hr	1.722	1.736	±.040	.014
Test Hop Proportion - %	4.81	4.51	±1.08	.30
Operational Availability - %	54.5	56.6	±5.1	2.1

The first factorial analysis was originally set to study the effects on operational availability and other output statistics caused by changes to the baseline ranging from -25 to +25 percent for NORS and 0 to +20 percent increase in utilization and failure rate. These points of consideration were the corners of the right-hand cube shown in Figure 4. When these test conditions were studied, an upper bound was discovered to exist beyond which the company unit utilization could not be reached. This required a change in the study points for the factorial analysis from a center point that measured the baseline (BL) plus 10 percent utilization and an upper set of points that evaluated BL plus 20 percent utilization to equivalent points for the factorial analysis measuring BL minus 10 percent and BL minus 20 percent. In Figure 4 the left hand cube shows the changes required in the test region due to the utilization limit. Figure 5 shows each of the test conditions simulated and studied. These test conditions are identified in terms of flight hours per aircraft per month for utilization, failures per hour for failure rate, and percentage increase/decrease in NORS for supply. Table IV shows these test condition values and the associated expected values of key operational parameters. The test conditions were simulated for the revised set of study points. Test point 5 was repeated four times and Table V shows the results. These four runs were discussed in relation to measuring the simulation error relative to the baseline run and are used throughout the analysis to justify computer runs being sufficiently close to the expected values to be statistically acceptable at the .01 level of significance. To compute the 1 percent level of significance, the standard deviation was computed for each significant statistic and multiplied by the normal distribution coefficient of 2.576, which corresponds to the 1 percent level of significance. As indicated above, all baseline values were checked with this deviation criterion to prove that the simulation results were sufficiently close to the expected values to be accepted as representative of the ORME operational statistics expected values.

Iterative computer runs were made at each of the study points until they were in the region of acceptability. One point was found to be out of limits. Condition 3, which was felt to be influenced by the utilization boundary, was out of limits. However, this point was accepted for the analysis because the expected flight-hour value could not be reached despite several attempts to get closer to the expected value. Saturating the flight schedule would permit the flight-hour value to be reached, but this would distort other important output statistics such as mission completion values. Although the analysis is slightly distorted by the use of this study point result, the distortion was not considered, in an analysis of this sort, to be sufficient to seriously jeopardize the overall study results. In the factorial analysis employed, the low and high utilization points are averaged over four values each, and therefore, any error is desensitized by this averaging process. Table VI shows the simulation statistics generated for the various test conditions. Table VII shows the difference between the values expected at each study point and those observed after successive iterations. Test point 1 shows an out-of-tolerance condition for inflight failures, but since at the total failure level the number of failures observed was in tolerance, the run was considered to be acceptable. It should be noted that Table VII defines over 100

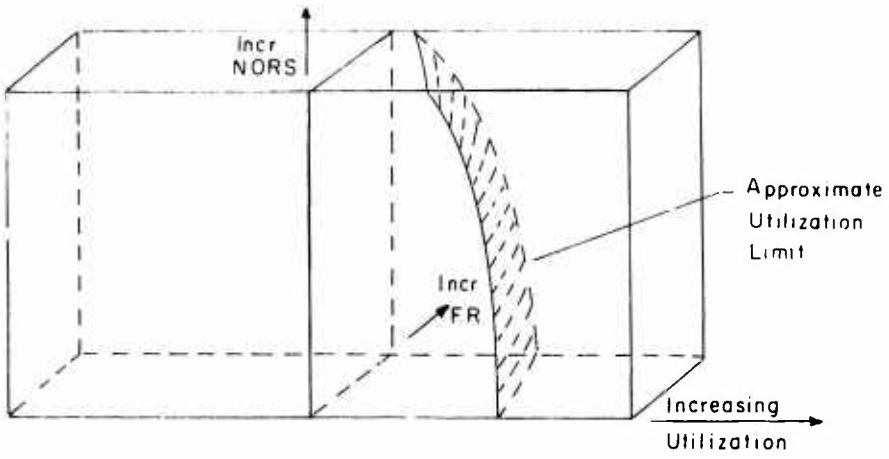

Figure 4. Utilization Boundary.

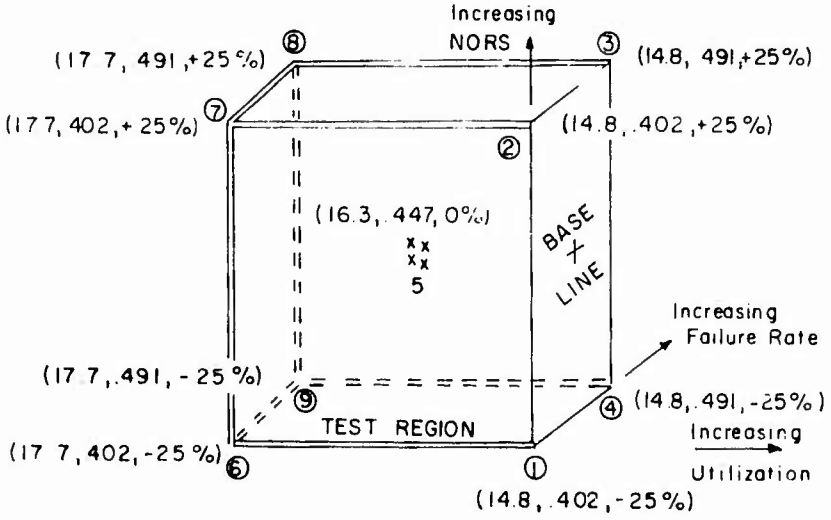

Figure 5. Test Region Studied.

TABLE IV. SIMULATION STATISTICS - COMPARISON OF EXPECTED VALUES AND SIMULATION STATISTICS FOR FACTORIAL TEST POINTS

FACTORIAL TEST POINT	BASELINE BL	1		2		3	
Test Condition							
Utilization, Flight Hours	2394	2394*		2394		2394	
Failure Rate, F/FH	.4465	.4019		.4019		.4912	
NORS (observed CH-54B)							
		EXPECTED	ACTUAL	EXPECTED	ACTUAL	EXPECTED	ACTUAL
Output Values							
Utilization, Flight Hours	2394	TC	2399	TC	2376	TC	2295
Failure Rate, F/FH	.4465	TC	.3718	TC	.4086	TC	.4750
NORS		TC		TC		TC	
Failures By When Found							
Preflight Inspection	.0305	.0276	.0313	.0276	.0337	.0338	.0366
Inflight	.1633	.1470	.1317	.1470	.1435	.1796	.1678
Daily Inspection	.1211	.1086	.1100	.1086	.1141	.1332	.1329
PMI Inspection	.0221	.0200	.0200	.0200	.0194	.0242	.0222
PMP Inspection	.1094	.0986	.0788	.0986	.0981	.1203	.1155
Abort Failures	.0200	.0163	.0138	.0163	.0119	.0201	.0205
Avg Flt Duration, Hour	1.722	BL	1.75	BL	1.74	BL	1.73
Test Hop Prop., %	4.81	BL	4.15	BL	4.03	BL	5.13
Operational Avail, %	54.5	MEAS	65.46	MEAS	58.61	MEAS	50.02

TC = Test Condition
* 2394 Flight Hours = 2394/(9 Aircraft x 18 Months) = 14.8 Flight Hours per Aircraft per Month. (Shown in Figure 4)

TABLE IV (Continued)

FACTORIAL TEST POINT	BASELINE * (BL)	4		5		6	
Test Condition							
Utilization, Flight Hours	2394	2394		2155		1915	
Failure Rate, F/FH	.4465	.4912		.4465		.4019	
NORS (observed CH-54B)							
		EXPECTED	ACTUAL	EXPECTED	ACTUAL	EXPECTED	ACTUAL
Output Values (18-month Simulation)							
Flight Hours	2394	TC	2409	TC	2142	TC	1912
Failure Rate, F/FH	.4465	TC	.4698	TC	.4679	TC	.4033
NORS		TC		TC		TC	
Failures By When Found							
Preflight	.0305	.0338	.0374	.0306	.0336	.0278	.0303
Inflight	.1633	.1796	.1785	.1633	.1657	.1467	.1616
Daily Inspection	.1211	.1332	.1312	.1206	.1242	.1091	.1067
PMI Inspection	.0221	.0242	.0224	.0218	.0229	.0198	.0188
PMP Inspection	.1094	.1203	.1005	.1109	.1214	.0987	.0858
Abort Failures	.0200	.0201	.0145	.0181	.0182	.0162	.0115
Avg Flt Duration, Hr.	1.722	BL	1.74	BL		BL	
Test Hop Prop., %	4.81	BL	4.85	BL	4.62	BL	4.15
Operational Avail., %	54.5	MEAS	57.93	MEAS	55.98	MEAS	70.63

*Repeated for reference.
TC = Test Condition

TABLE IV (Continued)

FACTORIAL TEST POINT	BASELINE* (BL)	7		8		9	
Test Condition							
Utilization, Flight Hours	2394	1915		1915		1915	
Failure Rate, F/FH	.4465	.4019		.4912		.4912	
NORS (observed CH-54B)							
		EXPECTED	ACTUAL	EXPECTED	ACTUAL	EXPECTED	ACTUAL
Output Values (18-month Simulation)							
Flight Hours	2394	TC	1911	TC	1930	TC	1910
Failure Rate, F/FH	.4465	TC	.3971	TC	.4688	TC	.4742
NORS		TC		TC		TC	
Failures By When Found							
Preflight	.0305	.0277	.0220	.0339	.0285	.0339	.0330
Inflight	.1633	.1467	.1575	.1796	.1663	.1796	.1686
Daily Inspection	.1211	.1091	.1073	.1332	.1409	.1332	.1382
PMI Inspection	.0221	.0200	.0183	.0240	.0264	.0240	.0277
PMP Inspection	.1094	.0987	.0921	.1206	.1078	.1206	.1068
Abort Failures	.0200	.0162	.0194	.0200	.0223	.0200	.0157
Avg Flt Duration, Hr.	1.722	BL		BL		BL	
Test Hop Prop., %	4.81	BL	4.15	BL	4.58	BL	4.70
Operational Avail., %	54.5	MEAS	60.99	MEAS	54.97	MEAS	66.90

*Repeated for reference.
TC = Test Condition

TABLE V. ANALYSIS OF SIMULATION ERROR

STATISTIC	EXPECTED VALUE	CENTER POINT WITH DIFF. RANDOM NOS.* A	B	C	D	MEAN	ST. DEV.	1% LEVEL OF SIGN ±Δ
Utilization, Flight Hours	2154.7	2141.5	2173.0	2148.2	2144.6	2151.8	14.39	37.07
Failure Rate, F/Flt. Hr	.4465	.4679	.4463	.4296	.4350	.4447	.0170	.0438
Failures (Total)	962	1002	970	923	933	957.00	36.18	93.20
Failures by When Found	-	-	-	-	-	-	-	-
Preflight Inspection	66	72	80	62	63	69.25	8.46	21.79
Inflight	352	355	332	334	352	343.25	11.93	30.73
Daily Inspection	261	266	263	264	280	268.25	7.93	20.43
PMI Inspection	48	49	42	49	49	47.25	3.70	9.52
PMP Inspection	236	260	253	214	189	229.00	35.96	86.24
Abort Failure Rate,A/Flt Hr	.0181	.0182	.0143	.0139	.0186	.0163	.0025	.0064
Abort Failures	39	39	31	30	40	35.00	5.23	13.47
Avg. Flt Duration, Hr	1.722	1.731	1.747	1.752	1.718	1.7370	.0155	.0399
Test Hop Proportion, %	4.81	4.62	4.27	4.09	5.05	4.51	.42	1.08
Operational Availability, %	-	55.98	58.48	54.06	57.95	56.618	2.016	5.193

* 18 Month Runs Using Different Random Number Sets.

TABLE VI. SIMULATION STATISTICS FOR VARIOUS TEST CONDITIONS

	Test Point *								
	1	2	3	4	5	6	7	8	9
Test Condition									
Utilization, Flight Hours	2394	2394	2394	2394	2155	1915	1915	1915	1915
Failure Rate, F/Flt. Hr	.4019	.4019	.4912	.4912	.4465	.4019	.4019	.4912	.4912
NORS (Observed CH-54B=100%)	75%	125%	125%	75%	100%	75%	125%	125%	75%
Observed Values									
Utilization, Flight Hours	2399	2376	2295	2409	2142	1912	1911	1930	1910
Failure Rate, F/Flt. Hr	.3718	.4086	.4750	.4698	.4679	.4033	.3971	.4688	.4742
Failures (Total)	892	971	1090	1132	1002	771	759	905	906
Failures by When Found	-	-	-	-	-	-	-	-	-
Preflight Inspection	75	80	84	90	72	58	42	55	63
Inflight	316	341	385	430	355	309	301	321	322
Daily Inspection	264	271	305	316	266	204	205	272	264
PMI Inspection	48	46	51	54	49	36	35	51	53
PMP Inspection	189	233	265	242	260	164	176	706	204
Abort Failures	33	28	47	35	39	22	37	43	30
Avg. Flt. Duration Hrs	1.75	1.74	1.73	1.74	1.73	1.75	1.74	1.74	1.73
Test Hop Proportion, %	4.15	4.03	5.13	4.85	4.62	4.48	4.15	4.58	4.70
Operational Availability	65.46	58.61	50.02	57.93	55.98	70.63	60.99	54.97	66.90

* As defined in Table IV.

TABLE VII. COMPARISON OF ACTUAL DIFFERENCE OF EXPECTED AND OBSERVED VALUES AND THE ALLOWABLE DIFFERENCE

	Allow. Error	Actual Test Point Errors								
		1	2	3	4	5	6	7	8	9
Utilization, Flight Hours	37	5	18	99	15	13	3	4	15	5
Failure Rate, F/Flt. Hr	.0438	.0301	.0067	.0161	.0214	.0233	.0014	.0048	.0224	.0170
Failures (Total)	93	70	9	44	86	38	1	11	35	36
Failures By When Discovered										
Preflight Inspection	22	9	14	3	9	6	5	11	10	2
Inflight	31	36	11	45	0	3	28	20	23	22
Daily Inspection	20	4	11	14	3	6	5	4	17	9
PMI Inspection	10	0	2	7	4	2	2	3	5	1
PMP Inspection	86	47	3	17	16	21	25	13	25	27
Abort Failures	13	6	11	1	13	0	9	6	5	3
Avg. Flight Duration, Hr	.040	.029	.036	.008	.009	.009	.024	.020	.020	.011
Test Hop Proportion of Total Flight Time, %	1.08	.66	.78	.04	.32	.19	.33	.66	.23	.11

tests of significance at the 1 percent level; therefore, it is highly likely that one statistic in 100 would be found slightly out-of-tolerance. Test point 3 has already been noted. After several iterations, the computer run exhibiting the closest value to the expected utilization was chosen for the analysis with the recognition that some error would be introduced into the analysis.

The first factorial analysis includes a study of the eight basic factorial analysis points to ascertain how, for example, the simulation output operational availability changes in relation to discrete changes in utilization, failure rate and NORS levels. It also includes the incorporation of the center point data to assess the curvature associated with the surfaces reflecting constant operational availability. The definition of operational availability used here is

$$\text{Operational Availability} = \frac{\text{Flight Time + Ready Time}}{\text{Flt. Time + Ready Time + Corr. Maint. + Prevent Maint. + Supply \& Admin. Downtime}}$$

Table VIII shows the factorial analyses results for operational availability. Table XIII in Appendix V shows in expanded arithmetic detail the information contained in Table VIII. The values for availability have been taken from Tables V and VI. Several observations must be made before proceeding. First, from a statistical viewpoint, there are eight degrees of freedom (df) associated with the data shown in the "Aircraft Availability Values" column since the data is derived from eight distinct test points. In the center point evaluation of the simulation error, four test points, and therefore a df of four, are reflected: one associated with the mean and three associated with the variance. Using an F level of significance test, the computed effects can be analyzed to determine whether they are true effects or simply perturbations due to simulation error. Bases on an $\alpha = .05$ and the df information above, if the F statistic (equal to the mean square value divided by the simulation error) exceeds the F distribution value for a .05 level of significance with 1 df in the numerator and 3 df in the denominator, then the effect associated with the mean square is judged to be a real effect. The critical $F_{1,3}$ distribution value for $\alpha = .05$ is 10.1, and the F statistic in the case of the NORS effect is 167.72/4.06, or 41.3. Therefore, the change in operational availability due to the computer input change in NORS level is real, and the best estimate of this change is -9.16 percent in operational availability when the NORS level is changed from its low to its high value. The changes in operational availability due to changes in failure rate and utilization are also found to be real.

This information coupled with the center point data permitted the drawing of operational response surfaces. These surfaces are shown in Figure 6 together with the contour lines of constant operational availability displayed on each face of the cubic space studied.

TABLE VIII. FACTORIAL ANALYSIS OF OPERATIONAL AVAILABILITY

TEST POINT (Table VII)	TEST FACTOR X1 NORS	X2 FAIL RATE	X3 LOW UTIL	AIRCRAFT AVAILABILITY VALUES (From Sim.Runs)	TEST FACTOR INTERACTIONS	F STATISTIC	ESTIMATE OF CHANGE
6	BL-25%	BL-10%	BL-20%	70.63	Average Response		60.65
7	BL+25%	BL-10%	BL-20%	60.99	X1	*41.3	-9.16
9	BL-25%	BL+10%	BL-20%	66.90	X2	*20.1	-6.39
8	BL+25%	BL+10%	BL-20%	54.97	X1, X2	0.3	-0.76
1	BL-25%	BL-10%	BL	65.46	X3	*14.6	-5.44
2	BL+25%	BL-10%	BL	58.61	X1, X3	1.3	1.63
4	BL-25%	BL+10%	BL	57.93	X2, X3	1.1	1.52
3	BL+25%	BL+10%	BL	50.02	X1, X2, X3	0.1	0.38

Operational Availability for Center Point (RMULT Runs): 55.98, 58.48, 54.06, 57.95
Mean Op Avail = 56.62% St. Dev = 2.016 (3 Degrees of Freedom)
α = .05 Critical Value for $F_{1,3}$ = 10.1
Center Point Variance = 4.06
*Real Effect

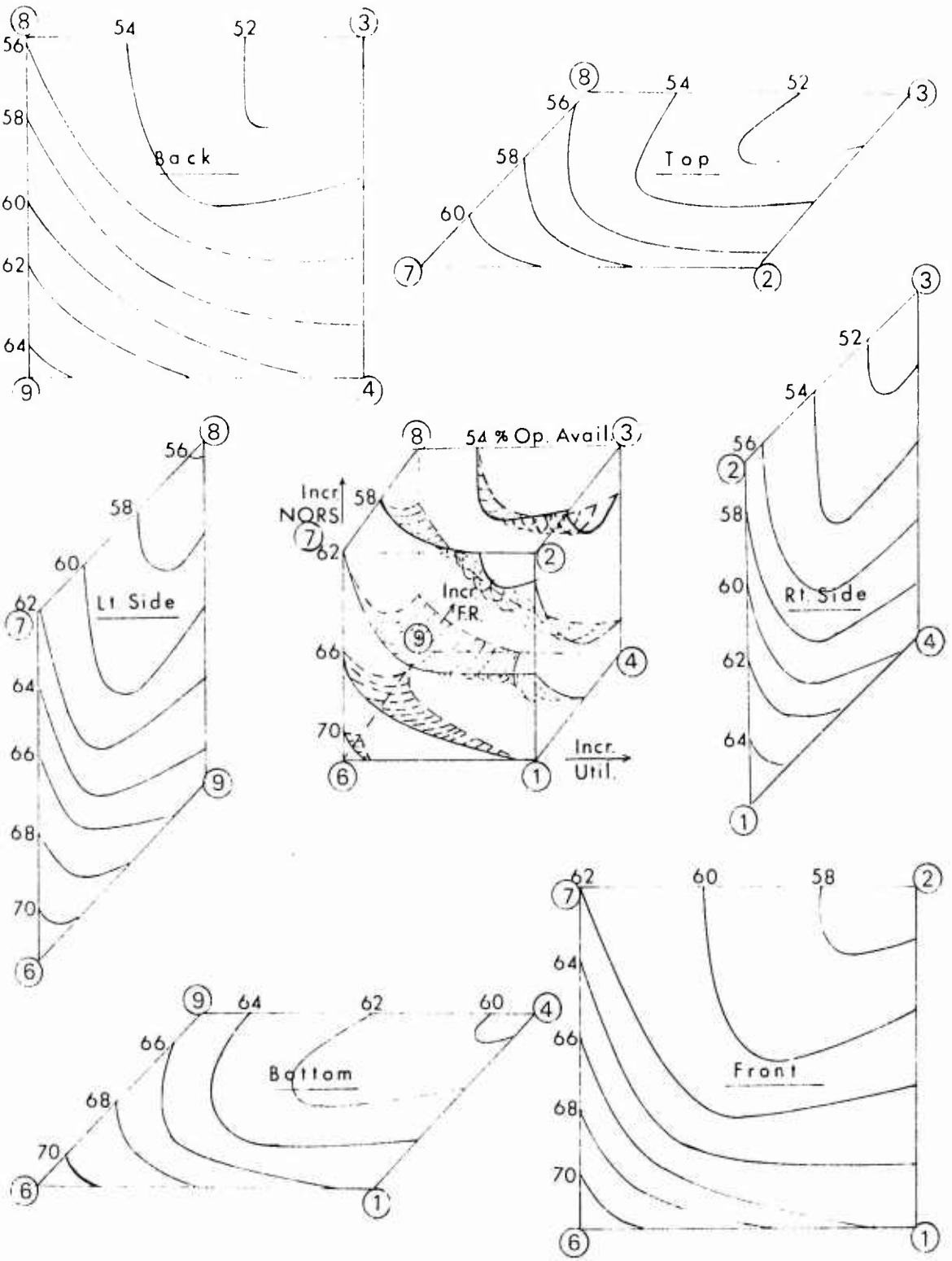

Figure 6. Operational Availability Contours.

From the analysis of the first factorial arrangement as it applies to operational availability, the following conclusions are drawn.

(1) The simulation error in relation to the operational availability model output is large and hampers the ability of the model to measure the effects of major changes in aircraft R&M characteristics. As a consequence, the contour lines and surfaces of constant operational availability shown in Figure 6 must be somewhat uncertain.

(2) Despite the large simulation error, the model yields consistent results; for example, decreasing the utilization by 20 percent has approximately the same effect on operational availability as decreasing failure rate by 20 percent. The utilization decrease results in about 5.4 percentage decrease in availability; failure rate results in about 6.4 percent. The NORS level was decreased about 40 percent and resulted in a proportional 9.2 percent increase in availability.

(3) The consistency is enhanced by the employment of the factorial arrangement. Although only eight test points were used to measure the effects of changes in utilization, failure rate, and NORS, the factorial arrangement permitted all eight test points, four at the low factor level and four at the high factor level, to be used to measure each factor response. This provided a major improvement in accuracy per test point over an arrangement which would measure each factor separately.

(4) Because of the high number of computer iterations required to "home in" on the factor levels of utilization and failure rate, especially failure rate, the study was limited to the factorial analysis indicated in the statement of work; however, a more forceful and exacting experimental design could be employed, if the required number of iteration runs could be cut down. The experimental design referred to is called the central composite design and is discussed in O. L. Daves book on Experimental Design.(4) This test design would provide a major improvement in computing the response surfaces. Figure 6 is simply a synthesis of the 8-point factorial analysis results shown in Table VIII and the center-point analysis also shown in that table.

To evaluate the overall sensitivity and credibility of the CH-54B model, several output parameters were evaluated on a statistical basis. Three levels of significance were used: α = .10, where the results were considered to be significant; α = .05, where the results were considered to be highly significant; and α = .01, where the results were considered to be very highly significant. The reason for considering several levels of significance is that an overall appreciation of the model's output is the focal point of this part of the evaluation, rather than decisionmaking. In a decision situation, one level of significance would be chosen based on

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(4) Daves, Owen L., DESIGN AND ANALYSIS OF INDUSTRIAL EXPERIMENTS, Second Edition, New York, Hafner Publishing Company, 1963, pp 532-553.

the consequences of making a wrong decision. In this evaluation the interest lies in the question: do the expected effects show up using this model, and how pronounced are those effects? In other words, are the effects believable, and how sensitive is the model to changes in aircraft quality or operational conditions? Table IX contains a listing of the effects shown to be significant, and Appendix V shows the computational detail establishing these effects as significant.

Failure rate, utilization, and NORS waiting time were the factors varied. The output values selected for study were unscheduled elapsed maintenance down hours; NORS hours plus unscheduled elapsed maintenance down hours; percentage of intrinsic availability where intrinsic availability measured the proportion of flight hours to flight hours plus unscheduled down hours and also the proportion of flight hours to flight hours plus scheduled and unscheduled down hours; direct maintenance man-hours per flight hour; percentage of mission accomplishment; and finally, observed NORS hours.

Table IX contains a summary of the responses found to be significant and estimates of these responses. The expected responses are summarized as follows. An increase in NORS waiting factor should adversely affect all the output statistics except those that measure active maintenance down time alone, namely, unscheduled elapsed maintenance down hours and direct maintenance man-hours per flight hour. An increase in failure rate should adversely affect all the output statistics. Finally, an increase in utilization should adversely affect all output statistics except intrinsic availability and direct maintenance man-hours per flight hour which would be expected to remain constant with increased flight hours.

The consistency of the actual significant effects with those expected is apparent. The major exception to this is in mission accomplishment, where it is expected that increases in NORS time, failure rate or utilization would cause less aircraft to be available and therefore less chance of performing and completing a mission that is called. In this instance it must be concluded that the model is not sensitive enough to measure the change in mission accomplishment for the changes in the levels of the factors analyzed. Another exception of concern was in direct maintenance man-hours per flight hour, where an increase in utilization has resulted in a decreased value for this statistic. Reflecting on the reasons that could cause this phenomenon led to an investigation of the difference in scheduled maintenance requirements per flight hour for both daily and preflight inspections. The four low utilization runs showed the need for .692 daily per flight hour and .727 preflight per flight hour, and the four high utilization runs showed .600 and .702 respectively. As the utilization goes up, therefore, the need for additional dailies and preflights goes up much more slowly, resulting in the lower scheduled maintenance man-hour per flight hour requirement. Table IX shows that the best estimate of the difference in direct maintenance man-hours per flight hour is -.57. Since it takes 5.4 man-hours per flight hour for performing daily inspections and 1.8 for preflights, the expected difference from this source should be

$$(.600 - .702)\ 5.4 + (.692 - .727)\ 1.8 = -.61$$

TABLE IX

SIGNIFICANT EFFECTS FROM THE QUANTITATIVE FACTORIAL ANALYSIS

OUTPUT STATISTIC	EFFECTED X FACTOR	ESTIMATE OF EFFECT	SIGNIFICANCE OF EFFECT NORS	FAIL RATE	UTIL
Unsched Active Elapsed Maint. Down Hours	Fail Rate	+1109		HS	
	Util	+1598			VHS
	NORS		N		
NORS + Unsched Elapsed Maint Down Hours	NORS	+8232	VHS		
	Fail Rate	+5711		HS	
	Util	+5292			HS
% Intrinsic Availability = (F.H./F.H. + Unsched. Down Hours)	NORS	-2.09	VHS	HS	
	Fail Rate	-1.57			
	Util				N
% Intrinsic Availability = (F.H./F.H. + Unsched. + Sched. Down Hours)	NORS	-1.76	VHS		
	Fail Rate	-1.34		HS	
	Util				N
Direct Maint. Man Hours/ Flt. Hr.	Fail Rate	+.28		S	
	Util	-.57			VHS
	NORS		N		
NORS Down Hours	NORS	+9888	VHS		
	Fail Rate	+6368		HS	
	Util				N

S -Significant
HS -Highly Significant
VHS -Very Highly Significant
N -Negligible

Again this shows the consistency of the CH-54B model and shows that, relative to certain statistical output, the model has a very sensitive response.

The above analysis is a further indication of the areas of sensitivity and lack of sensitivity produced by the CH-54B model, and of the care that must be exercised in the interpretation of results relative to the simulation error. The factorial analysis method employed here provides a viable and efficient method of minimizing the effects of this simulation error and should be seriously considered for use in all subsequent simulation studies of this type.

CONCLUSIONS

Conclusions are presented for five general areas: the variation associated with the model; the adequacy of the CH-54B model; the conclusions derived from the factorial analysis varying factors of NORS waiting time, failure rate, and utilization; the conclusions derived from the factorial analysis varying factors of major inspection policy, TBO policy, and repair/replacement time distribution; and finally, the conclusions derived from the statistical methodology employed.

The CH-54B model evidences a very large variation in operational availability and other output statistics. A large part of this variation is associated with the use of the NORS and cannibalization subroutines. Also, a low daily utilization of aircraft contributes to this variation. Despite this variation, the model yields statistical output that is consistent with expected changes in operational parameters.

The CH-54B baseline model was verified to reflect known CH-54B field operation as reported by the ORME field data collection program. This verification of the baseline model established that, within the error inherent in the model itself, the utilization, failure rates, and other aircraft/operational parameters were found to be representative of the ORME field data.

The simulation error associated with CH-54B R&M simulation model output was large but, due to the improved ability of the factorial analysis procedure to measure operational responses, changes in NOR waiting time, failure rate, and utilization factors, provided statistical output that was consistent with expectations and was relatively sensitive. For example, increasing either utilization, failure rate, or NORS waiting time by 20% produced about the same net effect of decreasing operational availability by 5%. This consistency and sensitivity were true for all statistical output studies, which included measures of intrinsic availability, direct maintenance man-hours per flight hour, unscheduled elapsed maintenance down hours, and not operationally ready time due to spares. The lone exception to this sensitivity was in the measurement of mission accomplishment (ratio of missions called to missions completed). Increased NORS waiting time, failure rate, or utilization would be expected to reduce mission accomplishment, but it was found that the model was not sufficiently sensitive for the prescribed 18-month simulation operation to measure this reduction.

The final conclusion is that statistical procedures are required to analyze the R&M model simulation output if real effects are to be discerned from random scatter and that factorial analysis is an important statistical procedure to minimize the required number of simulation runs.

RECOMMENDATIONS

1. The CH-54B model, which incorporates NORS data, evidences large variability in its simulated output, making it difficult to measure effects and creating an unnecessary number of iterative runs to home in on the failure rates associated with the specific condition simulated. This large variability is associated with how the basic R&M model is constructed and is inherent in the UH-1N model as well as the derivative CH-54B model. In the daily inspection, for example, a probability distribution of the number of failures is input to the model based on an expected number of daily inspections. Since the number of dailies can easily vary by 7%, as is reflected in Table VIII in the spread of daily inspections for different random number seeds, this variability is added to that created by the probability distribution of the number of failures. This probability distribution reflects the Poisson distribution based on the exponential time to failure, which implies a totally random occurrence of failure. The Poisson probability distribution already reflects the maximum spread of failure rates that should be expected. The introduction of variation due to the number of dailies unnecessarily and unrealistically magnifies this variability. It is recommended, therefore, to substantially reduce the computer time for the same simulation accuracy or, conversely, to substantially improve the accuracy for the same simulation time, that the model be changed in the method of simulating failures. Rather than simulating the number of failures each time a daily occurs, simulate failures independently of the events and then assign them on a probability distribution basis to the various events. This approach would not only eliminate unrealistic model variability, but would do it in a way that would simplify the model input function requirements.

The Reliability and Maintainability (R&M) Model currently used by the Eustis Directorate, USAAMRDL, has been modified to incorporate the failure methodology outlined above. The GAMMA distribution is used to compute the time to next failure, for each component, in terms of aircraft operating hours. When the aircraft reaches the precomputed operating hours, the component fails. Monte Carlo techniques are employed to determine if the failure is discovered at the time of failure, in subsequent missions, or in an inspection event, such as daily, preventive maintenance periodic (PMP), etc. The failure is placed on a list of other failures awaiting discovery when the appropriate event occurs.

2. It is further recommended that a statistical methodology be established for use in subsequent studies employing the R&M simulation model or the ARMS model. This methodology should be based on the statistical procedures put forth in this study. This methodology should encompass:

a) Evaluation of simulation error.
b) Validation of baseline model as consistent with expected values using a level of significance criterion in conjunction with simulation error measurement.
c) Use of factorial analysis procedures to evaluate alternative operational conditions.

d) Use of central composite design where response surface studies are desirable.

The establishment of such a statistical methodology would substantially enhance the efficiency of performing these studies, would produce improved sensitivity analyses, and would provide a better grasp and understanding of the trends brought about by changes in aircraft/operational characteristics.

APPENDIX I
ELEMENT IDENTIFICATION AND FAILURE RATE

Table X contains the numerical codes used to identify the subsystems and elements of the CH-54B. The element nomenclature and the failure rate associated with each element are identified in this table.

TABLE X. ELEMENT IDENTIFICATION AND FAILURE RATE

CODE SYS.-ELEM.	NOMENCLATURE	FAIL RATE OVER ALL EVENTS F/1000 Hrs.
01-	AIRFRAME	(23.99)
-01	R. H. Cockpit Door Sliding Window	.981
-02	L. H. Windshield Assy	.327
-03	Personnel Door Assy	.981
-04	Lower Cockpit Avionics Door Seal	.436
-05	STA 229 Frame Assy	.218
-06	Stringer-Fwd Frame Assy	.218
-07	Support-Fwd Frame Assy	.327
-08	Fwd Fuselage Work Platform Assy	.654
-09	Rt. Top Fuselage Util. Hyd. Cover Assy	1.963
-10	Lt. Top Fuselage Util. Hyd. Cover Assy	1.636
-11	Compass Flux Valve Support Assy	.327
-12	Lower Tail Pylon Bulk Head Assy	.218
-13	Fitting Assy, Stabil. Aft. Spar	.109
-14	Sleeve Bushing, Stabil. Aft. Spar	.109
-15	L. H. Land. Gear Support Strip	.109
-16	R. H. Land. Gear Support Strip	.109
-17	R. H. Land. Gear Upper Fwd Fairing Assy	.218
-18	R. H. Land. Gear Fwd Fairing Frame	327
-19	Pilot Inertia Reel	18
-20	Airframe Catchall	14.501
02-	LANDING GEAR	(27.06)
-01	Nose Wheel Centering Lock Cable	.109
-02	Nose Wheel Lock Control Handle	.327
-03	Nose Gear Lock Mech.	.327
-04	Nose Wheel Lock Bellcrank	.458
-05	Nose Gear Ski Cable	.218
-06	Nose Wheel Tire	.327
-07	Main Land. Gear Scissors Bolt	.327
-08	Nose Gear Torque Arm Bushing	.218
-09	Main Land. Gear Torque Arm Bushing	.436
-11	Parking Brake Valve	.872
02-12	Main Wheel Brake Disc	2.181
-13	Wheel Brake Pwr. Boost Cylinder Piston Seal	.436
-14	Copilot's Pwr. Boost Cylinder	1.963
-15	Wheel Brake Pwr. Boost Cylinder Internal Seal	.545
-16	Main Wheel Tire-Type 3	1.527
-17	Main Wheel Tire-Type III	3.816
-18	Main L. G. Brake Pucks	.545
-19	Main L. G. Wheel Brake Assy	.654
-20	Tail Skid Upper Yoke Bushing	.327
-21	Tail Skid Attachment Bushing	.327
-22	Tail Skid Brace Assy Bushing	.654
-23	Tail Skid Actuator	.763
-24	Land. Gear Catchall	9.704
03-	MECHANICAL FLT. CONTROL	(10.43)
-01	Collective Stick Boot	.436
-02	Coll. Stick Grip Switch	.109
-03	Coll. Friction Lock Sleeve Assy	.218
-04	Coll. Friction Lock Collet	.763
-05	Rt. Lat. Control Servo Rod End Bearing	.218
-06	Cyclic Pitch Control Connecting Rods	.436
-07	Lt. Lat. Control Servo Rod End Bearing	.163
-08	Rt. Lat. Cyclic Control Bellcrank	.218
-09	Aft Tail Cone Rt. Directional Control Cable	.218
-10	Rt. Fwd. Upper Deck Directional Control Cable	.327
-11	Aft Tail Cone Lt. Directional Control Cable	.218
-12	Directional Control, Rod End Bearing	.349

CODE SYS.-ELEM.	NOMENCLATURE	FAIL RATE OVER ALL EVENTS F/1000 Hrs.	CODE SYS.-ELEM.	NOMENCLATURE	FAIL RATE OVER ALL EVENTS F/1000 Hrs.
03-13	Mech. Flt. Control Catchall	6.760	05-	APP INSTALLATION	(9.36)
			-01	APP Shutoff Valve	.327
04-	ROTORS/BLADES	(50.26)	-02	APP Start Accumulator	.763
-01	Main Rotor Head	2.399	-03	APP Starter	3.053
-02	Rotating Swash Plate Control Arm Bearing	.436	-04	APP Starter Drive Coupling	.218
-03	Pitch Control Rod Boot	.436.	-05	APP Engine Mount Strut Assy	.218
-04	Sleeve and Spindle Assy	2.181	-06	APP Att Mount Rod End Upper Bearing	1.199
-05	Main Rotor Damper Assy	1.090	-07	APP Att Mount Rod End Lower Bearing	2.072
-06	M. R. H. Pitch Change Link	.654	-08	APP Installation Catchall	1.527
-07	Sleeve and Spindle Oil Seal	5.452			
-08	Rotating Scissors Laminated Shim	1.090			
-09	Rotating Scissors Link Assy	1.199	06-	TRANSMISSION	(48.19)
-10	Main Rotor Damper Trunnion Assy	3.380	-01	M. G. B. Rotor Brake Output Seal	1.090
-11	M. R. Damper Bearing	3.271	-02	No. 1 Engine Input Seal	1.527
-12	M. R. Damper Accumulator Assy	.981	-03	T. R. Takeoff Seal	.327
-13	Tail G. B. Output Housing Seal	.109	-04	Main Gear Box	2.726
-14	Tail Rotor Head Assy	1.090	-05	No. 2 Engine Input Seal	.545
-15	T. R. Pitch Change Link	1.308	-06	M. G. B. Oil Pump Assy	.109
-16	T. R. Blade Control Arm	.436	-07	M. G. B. Chip Detector	.218
-17	M. R. Blade Attaching Bolt	.763	-08	Intermediate Gear Box Output Seal	.436
-18	BIM Indicating Sys.	.327	-09	Intermediate Gear Box	.218
-19	Main Rotor Blade Assy	.091	-10	Tail Gear Box	.109
-20	Main Rotor Blade Assy	.091	-11	Tail Drive Shaft Disc. Assy	.109
-21	Main Rotor Blade Assy	.091	-12	Tail Drive Shaft Bearing Support Assy	2.290
-22	Main Rotor Blade Assy	.091			
-23	Main Rotor Blade Assy	.091	-13	Tail Drive Shaft Bearing Housing	.109
-24	Main Rotor Blade Assy	.091	-14	APP Clutch	8.941
-25	Main Blade Pocket Assy	.109	-15	APP Clutch Carbon Seal	.109
-26	T. R. Blade Attaching Bolt	.327	-16	APP Clutch Inboard Seal	.109
-27	T. R. Tip Cap Assy	.872	-17	Rotor Brake Disc	.545
-28	Tail Blade Assy	1.036	-18	Rotor Brake Package	5.016
-29	Tail Blade Assy	1.036	-19	Rotor Brake Press Switch	.763
-30	Tail Blade Assy	1.036	-20	M. G. B. Oil Cooler Bearing	.545
-31	Tail Blade Assy	1.036	-21	M. G. B. Oil Cooler Blower	3.380
-32	Rotors/Blades Catchall	17.663	-22	M. G. B. Oil Cooler V Belt	1.527

TABLE A CONTINUED

CODE SYS.-ELEM.	NOMENCLATURE	FAIL RATE OVER ALL EVENTS F/1000 Hrs.
06-23	Trans. Catchall	17.445
07-	POWER PLANT INSTALLATION	(39.04)
-01	N2 Speed Sense Cable Adapter Seal	.327
-02	Anti-Ice Bleed Air Line Jacket Assy	1.199
-03	R. H. Eng. Support Assy	.327
-04	Eng. Exhaust Attachment Bolt	1.199
-05	Anti-Ice Bleed Air Line	.436
-06	Eng. Exhaust Tail Pipe Assy	9.813
-07	Coll. Input Main Fuel Shutoff Control Installation	.436
-08	Coll. Input Fuel Shutoff Control Syncronizer	.763
-09	Coll. Input Fuel Shutoff Control Bellcrank	4.906
-10	Eng. Control Coll. Bias Shear Pin	3.380
-11	N1 Eng. Control Assy	.545
-12	Eng. Speed Control Actuator	4.797
-13	Eng. Hyd. Starter	1.090
-14	Eng. Start Valve	.785
-15	Eng. Hyd. Start Pressure Line	.218
-16	Eng. Mount Inboard Support Bushing	.218
-17	Eng. Mount Deck Fitting Bearing	.109
-18	Eng. Fwd. Strut Assy	.218
-19	EAPS Filter Element	.436
-20	EAPS Blower Unit	.327
-21	EAPS Cover Assy	.218
-22	Power Plant Installation Catchall	7.294
08-	HEATER/ANTI-ICE	(6.11)
-01	Heater Ignitor Unit Assy	.545
-02	Heater Control Assy	.763
-03	Ignitor Plug	1.636
-04	Eng. Anti-Ice Valve	1.417
-05	Heater/Anti-Ice Catchall	1.745

CODE SYS.-ELEM.	NOMENCLATURE	FAIL RATE OVER ALL EVENTS F/1000 Hrs.
09-	ELECTRICAL	(27.50)
-01	M. L. G. Isolation Valve Switch	1.527
-02	Pilot's Foot ICS Switch	.981
-03	Chip Detector Cannon Plug	.327
-04	Generator Terminal Board Cover	.109
-05	D. C. Power Reverse Current Relay	.654
-06	APP Ignition Coil	.436
-07	Eng. Start Time Delay Relay	.981
-08	Battery	.872
-09	Fwd. Anti- Collision Beacon Assy	1.854
-10	Aft Position Light	2.944
-11	Aft Anti- Collision Beacon Assy	5.106
-12	Spot Light Control	.545
-13	Fuel Gage Instrument Light	.327
-14	Overhead Dome Light	.109
-15	Dimmer Control Unit	.131
-16	Electrical Catchall	9.595
10-	HYD. FLIGHT CONTROLS	(6.54)
-01	Prim. Servo Center Web Support	.109
-02	Lt. Lat. Primary Servo Cylinder	.109
-03	Rt. Lat. Primary Servo Cylinder	.654
-04	AFCS Coll. Control Open Loop Spring	.545
-05	AFCS Hyd. Servo	1.745
-06	Coll. Control Spring Assy	.545
-07	AFCS Servo Clutch Syncronizer	.763
-08	T. R. Servo Link Assy	.109
-09	Tail Rotor Servo Assy	.109
-10	T. R. Servo Fitting Seal	.109
-11	Hyd. Flt. Control Catchall	1.745
11-	HYDRAULICS	(27.04)
-01	Utility Hyd. Pump	2.508
-02	Utility Pump Seal	.218
-03	Hoist Pump	1.854

TABLE X - CONTINUED

CODE SYS.-ELEM.	NOMENCLATURE	FAIL RATE OVER ALL EVENTS F/1000 Hrs.
11-04	Hyd. Solenoid Valve	.545
-05	Flt. Cont. Hydraulic Manifold Tube	.327
-06	Flt. Cont. Hydraulic Manifold Assy	.872
-07	2nd Stage Solenoid Pressure Switch	.763
-08	2nd Stage Servo Pressure Switch	.872
-09	Hoist Well Hyd. Fitting Seal	.218
-10	Hyd. Panel Seal	.218
-11	Cargo Hoist Hyd. Pump	.327
-12	Cargo Hoist Manifold Assy	1.527
-13	Hydraulics Catchall	16.791
12-	FUEL	(9.27)
-01	Eng. Fuel Press. Switch	.981
-02	Fuel Filter Element	1.745
-03	Fuel Boost Pump Pressure Switch	1.854
-04	Fuel Filter Assy	.436
-05	Fuel Catchall	4.252
13-	UTILITIES	(6.65)
-01	Windshield Wiper Assy	.763
-02	Wiper Blade	.109
-03	Windshield Washer Nozzle Assy	.109
-04	APP Fire Detector Bracket	.545
-05	Eng. Fire Detectors	.763
-06	Voice Warning Reproducer Converter	.436
-07	Voice Warning Signal Adapter	.981
-08	Utilities Catchall	2.944
14-	CARGO HANDLING	(9.81)
-01	Load Leveler Accumulator	.218
-02	Load Leveler Actuator	1.199
-03	Cargo Lashing Reel	.327
-04	Cargo Winch Cable Assy	.763
-05	Cargo Hoist Assy	.327
-06	Cargo Cable Guide Liner	1.090
-07	Cargo Winch Decoupler Cylinder	.763
14-08	Cargo Winch Decoupler Assy	.763
-09	Cargo Winch Hook Assy	.436
-10	Load Leveler Grip Assy	.436
-11	Cargo Handling Catchall	3.489
15-	INSTRUMENTS	(41.32)
-01	Tach Generator	2.944
-02	Hoist Indicator	.763
-03	Eng. Press. Ratio Fluid Damper	.545
-04	Fuel Flow Indicator	.545
-05	Directional Gyro	.327
-06	Course Indicator	.109
-07	Radio Magnetic Indicator	.218
-08	J-2 Compass Amplifier	.109
-09	Attitude Indicator	.545
-10	Altimeter	.545
-11	Turn and Slip Indicator	.436
-12	Flight Direction Indicator	.654
-13	Stand By Compass	1.308
-14	Stand By Compass Shock Mounts	.109
-15	Torque Sensor	.436
-16	Altitude Control Cover Assy	1.090
-17	Eng. Speed Switch	.545
-18	ERP Transmitter	.436
-19	Torque Indicator	5.561
-20	Main Trans. Oil Pressure Switch	1.745
-21	IGB Oil Press. Switch	.327
-22	Main Trans. Chip Detectors	.545
-23	OAT Indicator	.327
-24	Hoist Indicator Panel	.763
-25	Caution Panel Assy	.545
-26	Instruments Catchall	19.844
16-	AFCS	(28.13)
-01	Bar Altitude Controller	.981
-02	AFCS Control Panel	3.925

TABLE X - CONTINUED

CODE SYS.-ELEM.	NOMENCLATURE	FAIL RATE OVER ALL EVENTS F/1000 Hrs.
16-03	AFCS Control Panel Relay	.545
-04	Stick Trim Amplifier	1.527
-05	AFCS Yaw Control Amplifier	3.816
-06	AFCS Pitch Module	.872
-07	AFCS Roll Module	.654
-08	AFCS Yaw Module	.545
-09	AFCS Pitch Amplifier	.545
-10	Vertical Gyro	.763
-11	Rate Gyro	1.199
-12	Remote Stick Assy	1.963
-13	Remote Stick Resistor	.327
-14	Remote Stick Amplifier	.327
-15	AFCS Catchall	10.140
17-	COMMUNICATIONS	(18.97)
-01	ARC-102 HF Antenna Fwd	.327
-02	ARC-102 HF Antenna Aft	.545
-03	ARC-134 VHF Controller	.327
-04	ARC-134 VHF Rec.-Trans.	2.617
-05	ARC-131 Controller	.218
-06	ARC-131 Rec.-Trans.	2.290
-07	ARC-51 UHF Antenna	.109
-08	ARC-51 UHF Rec.Trans.	2.726
-09	AIC-12 ICS Control	5.670
-10	AIC-12 ICS Radio Switch	.545
-11	ICS Receptacle	.763
-12	APX-72 IFF Control	.218
-13	APX-72 IFF Receiver	.763
-14	Commun. Catchall	1.854
18-	NAVIGATION	(7.74)
-01	ARN-82 VOR Receiver	2.290
-02	ARN-82 VOR Course Indicator	.218
-03	ARN-33 ADF Receiver	2.617
-04	ARN-33 ADF Audio Trans.	.218
-05	ADF Antenna Inboard	.109
-06	ADF Antenna Outboard	1.308
-07	Nav. Catchall	.981
19-	TURBO SHAFT ENGINE	(38.71)
-01	Oil Strainer Seal	3.816
-02	Eng. Oil Strainer Cover	3.271
-03	Eng. Exhaust Light Gage Duct	.872
-04	Speed Sense Cable	3.489
-05	Eng. Oil Press. Switch	1.636
-06	Eng. Over Speed Monitor Switch	2.617
-07	Eng. Exhaust Heavy Gage Duct	1.199
-08	Eng. No. 1 Fuel Control	.763
-09	Eng. No. 2 Fuel Control	.763
-10	Engine Assy No. 1	2.399
-11	Engine Assy No. 2	2.399
-12	Eng. Anti-Ice Valve	.763
-13	Eng. Trubine Case Assy	2.508
-14	Eng. Fuel Monitoring Installation	1.745
-15	Turbo Eng. Catchall	10.467
20-	AUXILLARY POWER PLANT	(10.36)
-01	APP Control Assy	1.636
-02	90% Speed Switch	1.199
-03	Fuel Pressure Switch Assy	.327
-04	APP Gas Turbine Eng.	.654
-05	APP Input Shaft	.327
-06	Fuel Control	.436
-07	APP Unit	.981
-08	APP Catchall	4.797

APPENDIX II
CH-54B MODEL INPUT FUNCTION DEFINITION

The R&M model input data as organized from the ORME information base is described for the various functions below. These functions relate an independent value in the simulation model to a dependent value, and through these functions, the specific CH-54B aircraft/operation characteristics are introduced into the R&M model. For example, when the daily inspection logic is encountered in a model simulation and the probability of successfully passing the inspection without discovering a failure is required, Function 2, independent value 16, is located and the CH-54B value of .813781 is introduced into the simulation as that probability. This input data described is for the baseline model which has been used in the validation of the CH-54B. Appendix III contains a detailed listing of all CH-54B input functions.

Function 1

An average 1.9-hour single-point winch mission configuration flight was considered.

Function 2

Probability values for successfully passing various ground events without discovering a failure, to be used in the CH-54 baseline simulation, are given as follows:

	Ground Event	Success Probability
1	(Ordance Loading)	.999999
2	(Preflight)	.957697
5	(Aircrew)	.999999
8	(Intermediate Insp.)	.481713
11	(Turnaround Insp.)	.999999
16	(Daily Insp.)	.813781
17	(Periodic Insp.)	.000020
21	(% Good Parts from Supply)	.960000

Events 1, 5, and 11 were, in effect, ignored by entering a probability of success of certainty into the function, since based on observations of Sikorsky ORME reliability engineers, these three ground events do not occur in CH-54B operation. Probability values for events 2, 8, 16 and 17 were based on actual CH-54B failure rate records as reported by the ORME program. The probability value for event 21 is based on discussions with ORME reliability engineers, and its relatively high rate of bad parts from supply is born out by a joint AMRDL/Sikorsky helicopter maintenance effectiveness analysis study.(5)

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(5) Holbert, Calvin, and Newport, Gary, Helicopter Maintenance Effectiveness Analysis, Sikorsky Aircraft, USAAMRDL Technical Report 75-14.

Function 3

The probability of no maintenance action discovered during flight is .737472. This was determined from the ORME Program Quarterly Evaluation Report, SER-64344, Revision K. The "when discovered" summary of the number of maintenance actions of Table II shows 1498 M.A.'s in 9172 flight hours, or a .1633 rate of corrective maintenance actions to flight hours. For a 1.9-hour mission and a .7-hour test flight, the probabilities of sustaining no M.A.'s are

$$P(0) = e^{-.1633 \times 1.9} = .7332 \;\&\; P(0) = e^{-.1633 \times .7} = .8920.$$

Aborted missions reduce the average mission time, resulting in the higher function 3 values.

Function 4

From SER-64344, Revision K, the average flight durations were found to be between .7 and .8 hour for test hops and between 1.8 and 1.9 hours for single-point winch. Because .7 and 1.9 yielded the closest baseline flight hours, they were chosen.

Function 5

From SER-64344, Revision K, the probability of no abort given a M.A. in-flight was found to be .8892. Data from this SER showed 166 aborts in 1498 in-flight failures, or probability of abort equal to

$$\frac{166}{1498} = .1108$$

Therefore, P(no abort) = 1 - .1108 = .8892.

Function 6

This function defines the number of maintenance men, the maintenance work centers, i.e., the maintenance manpower specialty codes, and the elapsed maintenance times, as observed in the ORME preventive maintenance reporting forms to perform the preflight and daily inspections. The function reflects the following information:

Preflight requires two helicopter repairmen for .9 hour.

Daily requires two helicopter repairmen for 2.7 hours.

Function 7

The logic in the R&M model is so constructed as to reverse the priority convention used in the basic GPSS computer language. The priority values referred to in this function are for obtaining manpower to perform the various inspection events. This maintenance priority function, therefore, assigns the lowest priority numbers to the highest priority events. As

noted in the following assignment of priority numbers, the highest priority event is preflight, followed in order by daily, PMI and PMP inspections. These priorities agree with actual CH-54B operations as observed by Sikorsky ORME reliability engineers.

Function 7 values are:

Event	Priority No.
Preflight	5
Daily	15
PMI	29
PMP	30

Functions 10, 11, 12, 14 and 56

These functions have been revised to simulate CH-54B maintenance frequencies. The functions define the probabilities of multiple maintenance actions (M.A.'s) given that at least one M.A. has occurred. These functions provide the information for during flight, preflight, daily inspection and intermediate inspection, respectively. Since it was not feasible to construct this information from the ORME data base, the functions were derived using the assumption that the probability of a given number of M.A.'s follows a Poisson distribution. In functions 2 and 3, the probabilities of zero M.A.'s are defined for the various events, i.e.:

$P(0) = e^{-\lambda}$ where λ = the frequency of the M.A.

the P (at least one M.A.) = 1-P(0)

The Poisson distribution defines the probability of x occurrences by the formula

$$P(x) = \lambda^x e^{-\lambda} / x!$$

Therefore, the probability of x M.A.'s given that an M.A. has occurred is provided by the equation

$$P(x)/1-P(0) = (\lambda^x e^{-\lambda}/x!)/(1-e^{-\lambda})$$

Specific values for these functions can be observed in Appendix I.

Functions 15 and 23

These are sorting functions which permit the R&M model to sort down from the aircraft to the system and to the component within the system to identify the item causing the M.A. The functions have been revised to account for intermediate inspections. Specifically, these two functions direct the R&M model to other functions which describe the probability that an aircraft M.A. occurs in a given system and then to a second set of functions that describe the probability that a system M.A. occurs in

a given element or component. The description of the two functions as they relate to the various aircraft operational events is contained below.

Event	Event Code	FN15	FN23
Preflight	2	FN19	FN27
Aircrew[6]	5	FN15	FN24
In-flight	6	FN17	FN25
In-flight Abort	7	FN18	FN26
Intermed. Insp.	8	FN57	FN58
Preflight	12	FN19	FN27
Daily	16	FN20	FN28
Periodic Insp.	17	FN21	FN29

Functions 17, 18, 19, 20, 21, and 57

These functions provide the probability of a system's sustaining an M.A. given that the aircraft has sustained an action for the events of in-flight, in-flight abort, preflight, daily, periodic inspection and intermediate inspection. The specific values contained in these functions are shown in Table I under columns headed Cumulative Probability.

Functions 25, 26, 27, 28, 29 and 58

These functions provide the probability of an element or component sustaining an M.A. given that a particular system has sustained an action for the events in-flight, in-flight abort, preflight, daily periodic inspection and intermediate inspection respectively. For the CH-54B, each of these functions contains approximately 300 data entries which describe the most significant components from the viewpoint of frequency of occurrence, expenditures of manpower, and impact on mission success. In order to keep the number of elements reasonable, the least important elements in each system were grouped into a catchall element where cumulative frequency, the average maintenance times, and the most representative maintenance specialists were assigned to these catchall items. These 20 catchall elements accounted for slightly over 30% of all the M.A.'s.

A function 58 was added to this data set since the ORME data included the necessary information. It was not necessary to assume, as was the case in previous Army simulation efforts, that the same distribution of M.A.'s discovered during the more encompassing periodic inspection also applied to the intermediate inspection. The specific values of these functions are seen in Appendix III. These probabilities represent an actual count and the resulting ratio of component maintenance actions within each subsystem as observed within each event.

---

(6) Aircrew inspection is covered in these functions because it exists in the R&M model supplied by the Army; however, it will not be activated in the CH-54B simulations since the CH-54B has no comparable event.

Functions 32, 34 and 35

Function 32 defines the probability of a CH-54B aircraft's being not operationally ready (NOR) given a "no abort" in-flight M.A. This function, which prescribes a probability for each aircraft component, was generated from data taken from the ORME Discrepancy/Corrective Action Reports. The probabilities were computed for each element by taking the proportion of in-flight "no abort" M.A.'s that were identified in these ORME reports as having caused the aircraft to be placed in a "downed" status upon completion of the flight.

Functions 34 and 35 reflect, for each CH-54B component, the computed proprotion of M.A.'s discovered in preflight and daily inspection, respectively, that down the aircraft. The specific values of these functions are shown in Appendix III.

Functions 37, 40, 42, 43, 53, 54 and 70

These functions describe the on-aircraft and off-aircraft work performed to correct equipment discrepancies (maintenance actions) discovered during the course of equipment operation and inspection. The functions describe the number of maintenance men, their active working time, their specialty codes, and the mean elapsed maintenance time required to perform the corrective action for each component. These are "packed" functions in that their six-digit values convey two or three bits of information rather than the usual one bit of information. Where three bits are addressed, i.e., the six-digit values are in actuality three two-digit values, they are referred to as the A, B and C packs or AP, BP, CP. Where two bits of information are conveyed by the function, the two three-digit values are distinguished by referring to AP and BP. Table XI describes the packed functions as they have been defined to reflect the CH-54B aircraft/operation. Also, the following comments are offered to further describe this information by identifying the sources and limitations of the ORME data used.

a) The remove and replace data contained in Functions 37, 42, 43 and 70 was derived from ORME Discrepancy/Corrective Action Reports, where the disposition codes were identified as:

- Removed, Repaired, Reinstalled
- Removed, Repaired, Made Ready for Issue (RFI)
- Removed, Scrapped
- Removed, Returned to Depot
- Removed, Tested O.K., Made RFI

These Discrepancy/Corrective Action Reports included all time spent on removing the discrepant part and its replacement either with the same part or with a like item. In the first two cases above, however, some off-aircraft repair time is included. The error introduced by this fact is small since less than 15 percent of all removals observed fall into these two categories.

TABLE XI. ON AND OFF AIRCRAFT MAINTENANCE REQUIREMENTS

Function #	Packs	On Aircraft Repair Data	Remove & Replace Data	Off Aircraft Repair Data	Other Data
37	AP, BP		AP = % M.A.'s Requiring Component Remove & Replace		BP = % Components Repaired Given They Are Received at D.S.
40	AP, BP, CP	BP = Secondary Manpower Work Center CP = Primary Manpower Work Center		AP = Manpower Work Center	
42	AP, BP, CP		BP = Mean number of Men Req. From Secondary Work Center CP = Mean Number of Men Req. From Primary Work Center	AP = Mean Number of Men Required	
43	AP, BP		BP = Mean Elapsed Maintenance Time For Performing R&R	AP = Mean Elapsed Maintenance Time For Performing Repair	
53	AP, BP	AP = Mean Elapsed Maintenance Time			BP = ## Not used in R&M Model
54	AP, BP, CP	BP = Mean Number of Men Req. From Secondary Work Center CP = Mean Number of Men Req. From Primary Work Center			AP = ## Not used in R&M Model
70	AP, BP, CP		BP = Secondary Manpower Work Center CP = Primary Manpower Work Center		AP = ## Not used in R&M Model

b) Data for on-aircraft repair functions 40, 53, and 54 was taken from Discrepancy/Corrective Action Reports where the Disposition Code was defined as either "Repaired on Aircraft" or "Checked on Aircraft, Tested O.K."

c) In function 37, BP entries for each component have been set to zero. This was done because the ORME program did not contain data with which to measure the percentage of elements repaired given that they are received at G.S.

d) In functions 40, 42, and 43, the AP values were set to zero since the ORME program did not contain this information.

e) The ORME data shows, in many cases, that more than two maintenance specialties (work centers) were involved in correcting the faults associated with each component. As a result, two things were done. First, since the specialty requirements were somewhat different for remove and replace, as opposed to on-aircraft repair, a separate function, function 70, was created to distinguish between the primary and secondary specialists required for remove and replace vs. those required for on-aircraft repair. Second, where there still remained requirements for more than two maintenance specialties, their times were added to the primary or secondary specialist category that they most closely matched. If no match existed, the times were prorated over the primary and secondary work centers.

Function 44

All CH-54B component elements were reviewed with ORME engineers to define test hop requirements. Based on this work, function 44 has been revised to reflect CH-54B test hop component candidates. Appendix III identifies each component which may require a test hop by associating it with a value one. Appendix IV shows a change in the probability of a maintenance action requirement which was selected in order to bring the test hop flight time to 4.81 percent of the total flight time as was reflected in actual CH-54B operational history.

Function 71

Since function 70 was added to distinguish between work centers required for removal and replacement of a component, as opposed to its repair on-aircraft, an additional function is required to permit sorting the proper digits in the packed function. This function plus its associated variable statements (which also had to be added) are identified below.

```
71      Function      P1, E3

        V270   2      V269      3      V268
```

where V268 = FN70/10,000 for off-equipment W.C.
V269 = FN70 @ 10,000/100 for secondary W.C., R&R
V270 = FN70 @ 100 for primary W.C., R&R

APPENDIX III

CH-54B MODEL INPUT FUNCTION LISTING

The following is a listing of all the input function values used in the CH-54B model. Frequent references to these functions are made in the main body of the report.

```
      STORAGE    S42,26                                                    00002470
      STORAGE    S43-554,899                                               00002471
*                                                                          00002480
*                                                                          00002490
*                                                                          00002500
 1    FUNCTION   P4,D2       RECONFIGURATION SORT                         00002510
0     1     1    1                                                        00002520
*                                                                          00002530
*                                                                          00002540
 2    FUNCTION   P17,D8      GROUP EVENT PROB OF SUCCESS                  00002550
1     9999992    9576975     9999998    .8171311    99999916    81378160002560
17    60002021   960006                                                   00002570
*                                                                          00002580
*                                                                          00002590
 3    FUNCTION   P8,D2       PROB NO MA DURING FLIGHT                     00002600
0     8941221    737472                                                   00002610
*                                                                          00002620
*                                                                          00002630
 4    FUNCTION   P8,D2       MISSION DURATION                             00002640
0     7     1    15                                                       00002650
*                                                                          00002660
*                                                                          00002670
 5    FUNCTION   P8,D2       PROB OF NO ABORT/MA IN FLIGHT                00002680
0     8891861    889186                                                   00002690
*                                                                          00002700
*                                                                          00002710
 6    FUNCTION   P17,D2      LINE MAINTENANCE MANPOWER,MOS,+DURATION      00002720
2     20030916   200327                                                   00002730
*                                                                          00002740
*                                                                          00002750
 7    FUNCTION   P17,D10     MAINTENANCE PRIORITY                         00002760
1     1     2    5     3     28    8     29    11    10    12    5        00002770
16    15    17   30    22    20    23    25                               00002780
*                                                                          00002790
*                                                                          00002800
 8    FUNCTION   P17,D2      QUEUE LIMIT GROUND EVENTS                    00002810
1     6     3    999999                                                   00002820
*                                                                          00002830
*                                                                          00002840
 9    FUNCTION   P19,E9            WHEN DISCOVERED SORT MULTI-FAILURES    00002850
 2    FN11  5    FN13  6    FN10  7    FN10  8    FN56  12   FN11         00002860
 16   FN12  17   FN14  21   FN51                                           00002870
*                                                                          00002880
*                                                                          00002890
 10   FUNCTION   RN1,D4      PROB MULT MA/MA DURING FLIGHT                00002900
0.86571    0.98762    0.99913    0.99994                                  00002910
*                                                                          00002920
*                                                                          00002930
 11   FUNCTION   RN1,D3      PROB MULT MA/MA DURING PREFLIGHT             00002940
0.97851    0.99972    0.99993                                            00002950
*                                                                          00002960
*                                                                          00002970
 12   FUNCTION   RN1,D4      PROB MULT MA/MA DURING DAILY                 00002980
0.90051    0.99332    0.99973    0.99994                                  00002990
*                                                                          00003000
*                                                                          00003010
 13   FUNCTION   RN1,D2      PROB MULT MA/MA DURING AIRCREW               00003020
0.99101    0.99992                                                        00003030
*                                                                          00003040
*                                                                          00003050
 14   FUNCTION   RN1,D25     PROB MULT MA/MA PMP                          00003060
0.00021    0.00142    0.00563    0.01694    0.04145    0.08576           00003070
0.15437    0.24718    0.35899    0.480010   0.599211   0.706812          00003080
0.796513   0.865914   0.916015   0.950016   0.971617   0.984618          00003090
0.992019   0.996120   0.998121   0.999122   0.999623   0.999824          00003100
0.999925                                                                  00003110
```

```
*                                                                                00003120
*                                                                                00003130
 15    FUNCTION   P19,L8       WHEN DISCOVERED SORT SYSTEM FAILURE               00003140
2      FN14  5      FN16  6      FN17  7      FN18  8      FN57  12     FN19     00003150
16     FN20  17     FN21                                                         00003160
*                                                                                00003170
*                                                                                00003180
 16    FUNCTION   RN1,D21      PROB SYSTEM MA AIRCREW/MA AIRCREW                 00003190
0.180201      0.189202      0.207203      0.252304      0.342305      0.531506  00003200
0.617107      0.716208      0.725209      0.842310      0.878411      0.891912  00003210
0.905413      0.914414      0.936915      0.955019      0.959520      0.968522  00003220
0.973023      0.977524      0.999925                                           00003230
*                                                                                00003240
*                                                                                00003250
 17    FUNCTION   RN1,D20      PROB SYSTEM MA IN-FLIGHT/MA IN-FLIGHT             00003260
0.008701      0.030702      0.042703      0.076104      0.089505      0.171606  00003270
0.251607      0.275008      0.333009      0.357710      0.415711      0.443712  00003280
0.465713      0.483714      0.641915      0.780816      0.874317      0.915718  00003290
0.973119      0.999920                                                           00003300
*                                                                                00003310
*                                                                                00003320
 18    FUNCTION   RN1,D15      PROB SYSTEM MA ABORT IN-FLT/MA ABT IN-FLT         00003330
0.021001      0.027002      0.105304      0.147505      0.286106      0.406607  00003340
0.557211      0.587312      0.629513      0.665614      0.743915      0.810216  00003350
0.816217      0.954819      0.999920                                           00003360
*                                                                                00003370
*                                                                                00003380
 19    FUNCTION   RN1,D20      PROB SYSTEM MA PREFLIGHT/MA PREFLIGHT             00003390
0.082401      0.139202      0.193603      0.357404      0.372705      0.500606  00003400
0.543207      0.572308      0.682309      0.686610      0.774711      0.793912  00003410
0.806113      0.851814      0.912915      0.946316      0.956417      0.960218  00003420
0.981219      0.999920                                                           00003430
*                                                                                00003440
*                                                                                00003450
 20    FUNCTION   RN1,D20      PROB SYSTEM MA DAILY/MA DAILY                     00003460
0.045301      0.102702      0.119503      0.225604      0.279005      0.418906  00003470
0.550807      0.557408      0.638209      0.645710      0.730811      0.733412  00003480
0.745113      0.778614      0.811915      0.822316      0.836817      0.841918  00003490
0.973219      0.999920                                                           00003500
*                                                                                00003510
*                                                                                00003520
 21    FUNCTION   RN1,D20      PROB SYSTEM MA PMP/MA PMP                         00003530
0.120101      0.235002      0.254903      0.435604      0.471305      0.577906  00003540
0.648107      0.652108      0.685309      0.698610      0.736411      0.760212  00003550
0.770813      0.782314      0.858715      0.884916      0.897517      0.899818  00003560
0.985119      0.999920                                                           00003570
*                                                                                00003580
*                                                                                00003590
 22    FUNCTION   P3,L20       NUMBER OF ELEMENTS IN SYSTEMS                     00003600
01    20    02    24    03    13    04    32    05    8     06    23            00003610
07    22    08    5     09    16    10    11    11    13    12    5             00003620
13    8     14    11    15    26    16    15    17    14    18    7             00003630
19    15    20    6                                                            00003640
*                                                                                00003650
*                                                                                00003660
 23    FUNCTION   P19,E8       WHEN DISCOVERED SORT ELEMENT FAILURE              00003670
2      FN27  5      FN24  6      FN25  7      FN26  8      FN58  12     FN27     00003680
16     FN28  17     FN29                                                         00003690
*                                                                                00003700
*                                                                                00003710
 24    FUNCTION   FN40,L241    PROB ELEMENT MA AIRCREW/MA SYS AIRCREW            00003720
0101  025   0102  000   0103  050   0104  025   0105  050   0106  150           00003730
0107  125   0108  050   0109  050   0110  075   0111  100   0112  000           00003740
0113  075   0114  100   0115  075   0116  050   0201  000   0202  999           00003750
0203  000   0204  000   0205  000   0301  250   0302  250   0303  250           00003760
0304  250   0305  000   0401  000   0402  200   0403  000   0404  000   0405  250  00003770
```

```
0405 000  0406 000  0407 000  0408 000  0409 000  0410 000  00003780
0411 100  0412 000  0413 000  0414 000  0415 200  0416 200  00003790
0417 000  0418 100  0419 100  0420 000  0421 100  0422 000  00003800
0423 000  0424 000  0425 000  0501 200  0502 100  0503 000  00003810
0504 000  0505 000  0506 150  0507 250  0508 000  0509 000  00003820
0510 250  0511 000  0512 000  0513 050  0514 000  0515 000  00003830
0516 000  0517 000  0601 000  0602 000  0603 000  0604 000  00003840
0605 071  0606 095  0607 214  0608 048  0609 000  0610 000  00003850
0611 143  0612 048  0613 214  0614 071  0615 000  0616 071  00003860
0617 000  0618 024  0701 105  0702 000  0703 053  0704 105  00003870
0705 000  0706 000  0707 000  0708 158  0709 000  0710 000  00003880
0711 000  0712 053  0713 053  0714 053  0715 053  0716 105  00003890
0717 053  0718 053  0719 053  0720 000  0721 000  0722 000  00003900
0723 000  0724 105  0725 000  0801 000  0802 091  0803 136  00003910
0804 000  0805 000  0806 091  0807 000  0808 091  0809 000  00003920
0810 000  0811 045  0812 273  0813 000  0814 000  0815 045  00003930
0816 045  0817 045  0818 136  0819 000  0820 000  0821 000  00003940
0901 500  0902 000  0903 000  0904 500  0905 000  0906 000  00003950
0907 000  0908 000  1001 077  1002 038  1003 000  1004 192  00003960
1005 192  1006 231  1007 038  1008 077  1009 077  1010 000  00003970
1011 000  1012 000  1013 000  1014 038  1015 000  1016 038  00003980
1017 000  1018 000  1019 000  1101 375  1102 000  1103 125  00003990
1104 000  1105 000  1106 000  1107 125  1108 000  1109 375  00004000
1110 000  1201 000  1202 333  1203 000  1204 000  1205 000  00004010
1206 000  1207 667  1208 000  1209 000  1301 000  1302 333  00004020
1303 333  1304 000  1305 333  1401 000  1402 500  1403 000  00004030
1404 500  1405 000  1406 000  1407 000  1408 000  1409 000  00004040
1410 000  1411 000  1501 200  1502 000  1503 000  1504 200  00004050
1505 000  1506 000  1507 000  1508 000  1509 200  1510 200  00004060
1511 000  1512 200  1513 000  1514 000  1515 000  1516 000  00004070
1517 000  1518 000  1519 000  1520 000  1521 000  1522 000  00004080
1601 000  1602 000  1603 000  1701 000  1702 000  1703 000  00004090
1801 000  1802 000  1803 000  1901 000  1902 000  1903 000  00004100
1904 000  1905 750  1906 250  2001 000  2002 000  2003 999  00004110
2101 000  2201 999  2202 000  2203 000  2301 999  2401 999  00004120
2501 999                                                    00004130
*                                                           00004140
*                                                           00004150
 25    FUNCTION    FN40,L296    PROB ELEMENT MA IN-FLIGHT/SYS MA IN-FLIGHT00004160
0101 000  0102 077  0103 077  0104 000  0105 000  0106 000  00004170
0107 000  0108 000  0109 000  0110 000  0111 000  0112 000  00004180
0113 000  0114 000  0115 000  0116 000  0117 000  0118 000  00004190
0119 000  0120 846  0201 030  0202 030  0203 061  0204 030  00004200
0205 000  0206 000  0207 000  0208 000  0209 000  0210 000  00004210
0211 000  0212 303  0213 000  0214 000  0215 000  0216 091  00004220
0217 061  0218 030  0219 000  0220 000  0221 000  0222 000  00004230
0223 091  0224 273  0301 000  0302 055  0303 000  0304 333  00004240
0305 000  0306 000  0307 000  0308 000  0309 000  0310 000  00004250
0311 000  0312 000  0313 611  0401 080  0402 000  0403 000  00004260
0404 020  0405 000  0406 020  0407 060  0408 000  0409 000  00004270
0410 020  0411 120  0412 000  0413 000  0414 020  0415 000  00004280
0416 000  0417 000  0418 000  0419 004  0420 004  0421 004  00004290
0422 004  0423 004  0424 004  0425 000  0426 000  0427 000  00004300
0428 000  0429 000  0430 000  0431 000  0432 640  0501 000  00004310
0502 050  0503 850  0504 100  0505 000  0506 000  0507 000  00004320
0508 000  0601 000  0602 000  0603 008  0604 106  0605 000  00004330
0606 008  0607 000  0608 000  0609 008  0610 000  0611 000  00004340
0612 008  0613 008  0614 228  0615 000  0616 000  0617 008  00004350
0618 211  0619 057  0620 000  0621 008  0622 024  0623 317  00004360
0701 008  0702 017  0703 000  0704 000  0705 000  0706 017  00004370
0707 025  0708 042  0709 218  0710 185  0711 034  0712 218  00004380
0713 008  0714 034  0715 017  0716 000  0717 000  0718 000  00004390
0719 000  0720 017  0721 000  0722 160  0801 083  0802 167  00004400
0803 333  0804 167  0805 250  0901 103  0902 034  0903 000  00004410
0904 000  0905 034  0906 011  0907 046  0908 011  0909 069  00004420
0910 092  0911 230  0912 023  0913 023  0914 011  0915 000  00004430
```

```
0916 510 1001 000 1002 000 1003 054 1004 135 1005 351 00004440
1006 168 1007 162 1008 000 1009 000 1010 000 1011 189 00004450
1101 103 1102 000 1103 103 1104 011 1105 011 1106 034 00004460
1107 034 1108 069 1109 000 1110 000 1111 011 1112 034 00004470
1113 586 1201 071 1202 333 1203 238 1204 048 1205 310 00004480
1301 030 1302 000 1303 030 1304 000 1305 182 1306 061 00004490
1307 242 1308 455 1401 000 1402 074 1403 037 1404 111 00004500
1405 037 1406 000 1407 037 1408 148 1409 074 1410 000 00004510
1411 481 1501 080 1502 021 1503 017 1504 013 1505 013 00004520
1506 004 1507 008 1508 004 1509 013 1510 008 1511 017 00004530
1512 017 1513 017 1514 000 1515 008 1516 000 1517 004 00004540
1518 013 1519 198 1520 051 1521 008 1522 013 1523 008 00004550
1524 025 1525 013 1526 426 1601 043 1602 144 1603 019 00004560
1604 058 1605 154 1606 034 1607 029 1608 024 1609 019 00004570
1610 029 1611 043 1612 067 1613 010 1614 014 1615 313 00004580
1701 007 1702 000 1703 021 1704 157 1705 014 1706 129 00004590
1707 000 1708 157 1709 329 1710 029 1711 043 1712 014 00004600
1713 050 1714 050 1801 339 1802 032 1803 387 1804 000 00004610
1805 016 1806 081 1807 145 1901 035 1902 058 1903 000 00004620
1904 012 1905 093 1906 198 1907 000 1908 041 1909 041 00004630
1910 081 1911 081 1912 023 1913 000 1914 128 1915 209 00004640
2001 075 2002 200 2003 075 2004 100 2005 050 2006 075 00004650
2007 100 2008 325                                       00004660
 26    FUNCTION    FN46,L296    PROb ELEMENT MA INFLT ABT/SYS MA INFLT ABT00004670
0101 000 0102 000 0103 000 0104 000 0105 000 0106 000 00004680
0107 000 0108 000 0109 000 0110 000 0111 000 0112 000 00004690
0113 000 0114 000 0115 000 0116 000 0117 000 0118 000 00004700
0119 000 0120 999 0201 000 0202 000 0203 000 0204 000 00004710
0205 000 0206 000 0207 000 0208 000 0209 000 0210 000 00004720
0211 000 0212 000 0213 000 0214 000 0215 000 0216 999 00004730
0217 000 0218 000 0219 000 0220 000 0221 000 0222 000 00004740
0223 000 0224 000 0301 000 0302 000 0303 000 0304 000 00004750
0305 000 0306 000 0307 000 0308 000 0309 000 0310 000 00004760
0311 000 0312 000 0313 000 0401 077 0402 000 0403 000 00004770
0404 154 0405 000 0406 000 0407 000 0408 077 0409 000 00004780
0410 000 0411 000 0412 000 0413 000 0414 077 0415 000 00004790
0416 000 0417 000 0418 000 0419 013 0420 013 0421 013 00004800
0422 013 0423 013 0424 013 0425 077 0426 000 0427 000 00004810
0428 000 0429 000 0430 000 0431 000 0432 462 0501 000 00004820
0502 286 0503 571 0504 000 0505 000 0506 000 0507 000 00004830
0508 143 0601 000 0602 000 0603 000 0604 174 0605 000 00004840
0606 000 0607 043 0608 000 0609 043 0610 000 0611 043 00004850
0612 000 0613 000 0614 261 0615 000 0616 000 0617 000 00004860
0618 043 0619 000 0620 000 0621 000 0622 087 0623 304 00004870
0701 000 0702 050 0703 000 0704 000 0705 000 0706 000 00004880
0707 000 0708 100 0709 300 0710 200 0711 050 0712 100 00004890
0713 000 0714 050 0715 000 0716 000 0717 000 0718 000 00004900
0719 000 0720 000 0721 000 0722 150 0801 000 0802 000 00004910
0803 000 0804 000 0805 000 0901 000 0902 000 0903 000 00004920
0904 000 0905 000 0906 000 0907 000 0908 000 0909 000 00004930
0910 000 0911 000 0912 000 0913 000 0914 000 0915 000 00004940
0916 000 1001 000 1002 000 1003 000 1004 000 1005 000 00004950
1006 000 1007 000 1008 000 1009 000 1010 000 1011 000 00004960
1101 160 1102 000 1103 000 1104 000 1105 000 1106 080 00004970
1107 000 1108 080 1109 000 1110 000 1111 000 1112 120 00004980
1113 560 1201 200 1202 000 1203 000 1204 000 1205 800 00004990
1301 000 1302 000 1303 000 1304 000 1305 429 1306 000 00005000
1307 000 1308 571 1401 000 1402 000 1403 000 1404 000 00005010
1405 167 1406 000 1407 167 1408 500 1409 000 1410 000 00005020
1411 167 1501 308 1502 000 1503 000 1504 000 1505 000 00005030
1506 000 1507 000 1508 000 1509 000 1510 000 1511 000 00005040
1512 000 1513 000 1514 000 1515 077 1516 000 1517 077 00005050
1518 000 1519 077 1520 154 1521 077 1522 077 1523 000 00005060
1524 000 1525 000 1526 154 1601 000 1602 091 1603 182 00005070
1604 000 1605 091 1606 000 1607 091 1608 000 1609 000 00005080
1610 000 1611 000 1612 091 1613 000 1614 000 1615 455 00005090
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1701	000	1702	000	1703	000	1704	000	1705	000	1706	000	00005100
1707	000	1708	000	1709	000	1710	000	1711	000	1712	000	00005110
1713	000	1714	999	1801	000	1802	000	1803	000	1804	000	00005120
1805	000	1806	000	1807	000	1901	000	1902	043	1903	000	00005130
1904	000	1905	000	1906	000	1907	000	1908	043	1909	043	00005140
1910	087	1911	087	1912	000	1913	000	1914	304	1915	000	00005150
2001	111	2002	333	2003	000	2004	111	2005	000	2006	000	00005160
2007	000	2008	444									00005170
27	FUNCTION		FN#6,L296		PROB	ELEMENT MA		PREFLIGHT/SYS MA		PREFLIGHT		00005180
0101	056	0102	000	0103	056	0104	000	0105	000	0106	000	00005190
0107	000	0108	000	0109	000	0110	000	0111	000	0112	022	00005200
0113	009	0114	009	0115	009	0116	000	0117	000	0118	000	00005210
0119	022	0120	619	0201	000	0202	000	0203	000	0204	050	00005220
0205	000	0206	000	0207	000	0208	000	0209	000	0210	000	00005230
0211	100	0212	125	0213	000	0214	069	0215	000	0216	100	00005240
0217	000	0218	000	0219	094	0220	000	0221	000	0222	000	00005250
0223	003	0224	400	0301	065	0302	000	0303	000	0304	000	00005260
0305	033	0306	201	0307	033	0308	000	0309	000	0310	000	00005270
0311	000	0312	052	0313	556	0401	096	0402	087	0403	022	00005280
0404	003	0405	028	0406	000	0407	000	0408	152	0409	043	00005290
0410	000	0411	000	0412	000	0413	022	0414	098	0415	022	00005300
0416	000	0417	000	0418	000	0419	000	0420	000	0421	000	00005310
0422	000	0423	000	0424	000	0425	000	0426	000	0427	000	00005320
0428	019	0429	019	0430	019	0431	019	0432	289	0501	000	00005330
0502	465	0503	000	0504	000	0505	000	0506	000	0507	000	00005340
0508	535	0601	000	0602	000	0603	000	0604	000	0605	000	00005350
0606	000	0607	000	0608	000	0609	000	0610	000	0611	028	00005360
0612	069	0613	000	0614	061	0615	000	0616	006	0617	000	00005370
0618	000	0619	000	0620	000	0621	031	0622	197	0623	608	00005380
0701	000	0702	000	0703	000	0704	000	0705	083	0706	183	00005390
0707	017	0708	000	0709	000	0710	000	0711	000	0712	000	00005400
0713	150	0714	067	0715	000	0716	000	0717	016	0718	000	00005410
0719	083	0720	016	0721	000	0722	383	0801	061	0802	000	00005420
0803	366	0804	573	0805	000	0901	000	0902	000	0903	000	00005430
0904	000	0905	000	0906	000	0907	000	0908	000	0909	282	00005440
0910	051	0911	186	0912	000	0913	000	0914	000	0915	010	00005450
0916	465	1001	000	1002	853	1003	060	1004	000	1005	000	00005460
1006	000	1007	167	1008	000	1009	000	1010	000	1011	000	00005470
1101	113	1102	000	1103	161	1104	121	1105	000	1106	000	00005480
1107	000	1108	000	1109	000	1110	081	1111	000	1112	000	00005490
1113	524	1201	000	1202	000	1203	426	1204	093	1205	481	00005500
1301	000	1302	000	1303	000	1304	000	1305	050	1306	000	00005510
1307	050	1308	900	1401	041	1402	146	1403	163	1404	000	00005520
1405	041	1406	000	1407	244	1408	000	1409	041	1410	325	00005530
1411	000	1501	157	1502	000	1503	012	1504	000	1505	000	00005540
1506	000	1507	000	1508	000	1509	000	1510	000	1511	000	00005550
1512	000	1513	000	1514	000	1515	029	1516	000	1517	000	00005560
1518	012	1519	000	1520	000	1521	012	1522	029	1523	058	00005570
1524	000	1525	116	1526	576	1601	000	1602	160	1603	000	00005580
1604	053	1605	000	1606	021	1607	000	1608	000	1609	021	00005590
1610	021	1611	000	1612	000	1613	021	1614	000	1615	702	00005600
1701	000	1702	000	1703	000	1704	000	1705	000	1706	000	00005610
1707	000	1708	882	1709	000	1710	059	1711	059	1712	000	00005620
1713	000	1714	000	1801	000	1802	000	1803	000	1804	999	00005630
1805	000	1806	000	1807	000	1901	203	1902	000	1903	000	00005640
1904	000	1905	000	1906	000	1907	000	1908	000	1909	000	00005650
1910	000	1911	000	1912	000	1913	000	1914	000	1915	787	00005660
2001	588	2002	137	2003	000	2004	000	2005	000	2006	039	00005670
2007	235	2008	000									00005680
28	FUNCTION		FN#6,L296		PROB	ELEMENT MA		DAILY	/SYS MA	DAILY		00005690
0101	102	0102	000	0103	000	0104	080	0105	000	0106	000	00005700
0107	000	0108	000	0109	167	0110	046	0111	000	0112	010	00005710
0113	006	0114	006	0115	006	0116	000	0117	000	0118	000	00005720
0119	010	0120	568	0201	000	0202	000	0203	000	0204	013	00005730
0205	000	0206	000	0207	016	0208	000	0209	000	0210	000	00005740
0211	025	0212	094	0213	000	0214	124	0215	000	0216	122	00005750

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0217 077 0218 000 0219 214 0220 000 0221 000 0222 016 00005760
0223 016 0224 477 0301 108 0302 000 0303 000 0304 000 00005770
0305 027 0306 000 0307 000 0308 000 0309 000 0310 000 00005780
0311 000 0312 643 0313 823 0401 030 0402 000 0403 007 00005790
0404 068 0405 009 0406 000 0407 170 0408 000 0409 046 00005800
0410 076 0411 044 0412 037 0413 000 0414 023 0415 007 00005810
0416 000 0417 000 0418 010 0419 000 0420 000 0421 000 00005820
0422 000 0423 000 0424 000 0425 000 0426 000 0427 044 00005830
0428 015 0429 015 0430 015 0431 015 0432 372 0501 000 00005840
0502 077 0503 212 0504 000 0505 000 0506 062 0507 243 00005850
0508 405 0601 036 0602 075 0603 006 0604 039 0605 032 00005860
0606 000 0607 013 0608 006 0609 000 0610 000 0611 000 00005870
0612 056 0613 000 0614 209 0615 006 0616 002 0617 026 00005880
0618 077 0619 000 0620 000 0621 050 0622 008 0623 357 00005890
0701 014 0702 031 0703 007 0704 068 0705 021 0706 495 00005900
0707 002 0708 007 0709 033 0710 041 0711 007 0712 031 00005910
0713 037 0714 005 0715 000 0716 000 0717 002 0718 000 00005920
0719 014 0720 002 0721 014 0722 171 0801 068 0802 137 00005930
0803 000 0804 315 0805 479 0901 000 0902 033 0903 017 00005940
0904 003 0905 033 0906 000 0907 000 0908 047 0909 025 00005950
0910 158 0911 241 0912 033 0913 011 0914 000 0915 003 00005960
0916 394 1001 000 1002 000 1003 000 1004 000 1005 000 00005970
1006 120 1007 036 1008 000 1009 120 1010 000 1011 723 00005980
1101 059 1102 021 1103 000 1104 011 1105 000 1106 040 00005990
1107 029 1108 011 1109 000 1110 000 1111 021 1112 117 00006000
1113 692 1201 000 1202 000 1203 828 1204 172 1205 000 00006010
1301 306 1302 000 1303 000 1304 308 1305 023 1306 154 00006020
1307 023 1308 185 1401 014 1402 148 1403 000 1404 036 00006030
1405 014 1406 173 1407 082 1408 000 1409 014 1410 000 00006040
1411 521 1501 000 1502 027 1503 008 1504 000 1505 000 00006050
1506 000 1507 000 1508 000 1509 053 1510 027 1511 000 00006060
1512 053 1513 000 1514 000 1515 013 1516 027 1517 053 00006070
1518 006 1519 000 1520 000 1521 008 1522 013 1523 000 00006080
1524 027 1525 000 1526 684 1601 000 1602 130 1603 000 00006090
1604 043 1605 000 1606 026 1607 000 1608 000 1609 026 00006100
1610 026 1611 006 1612 348 1613 026 1614 000 1615 374 00006110
1701 000 1702 248 1703 000 1704 000 1705 000 1706 000 00006120
1707 000 1708 000 1709 280 1710 019 1711 019 1712 000 00006130
1713 000 1714 435 1801 000 1802 000 1803 000 1804 088 00006140
1805 000 1806 912 1807 000 1901 180 1902 103 1903 021 00006150
1904 000 1905 048 1906 024 1907 041 1908 000 1909 000 00006160
1910 062 1911 062 1912 034 1913 146 1914 023 1915 257 00006170
2001 101 2002 027 2003 000 2004 034 2005 000 2006 010 00006180
2007 044 2008 785                                       00006190
 29    FUNCTION    FN46,L296    PROD ELEMENT MA  P M P   /SYS MA  P M P 00006200
0101 022 0102 017 0103 056 0104 000 0105 017 0106 017 00006210
0107 017 0108 050 0109 070 0110 095 0111 025 0112 004 00006220
0113 002 0114 002 0115 002 0116 008 0117 017 0118 025 00006230
0119 004 0120 551 0201 000 0202 017 0203 000 0204 007 00006240
0205 000 0206 026 0207 017 0208 009 0209 035 0210 000 00006250
0211 028 0212 017 0213 035 0214 078 0215 043 0216 014 00006260
0217 245 0218 035 0219 013 0220 013 0221 000 0222 026 00006270
0223 009 0224 333 0301 000 0302 000 0303 100 0304 050 00006280
0305 025 0306 000 0307 025 0308 100 0309 050 0310 100 00006290
0311 000 0312 040 0313 510 0401 025 0402 000 0403 011 00006300
0404 033 0405 040 0406 028 0407 118 0408 007 0409 006 00006310
0410 077 0411 095 0412 019 0413 020 0414 006 0415 039 00006320
0416 022 0417 039 0418 008 0419 000 0420 000 0421 000 00006330
0422 000 0423 000 0424 000 0425 006 0426 017 0427 007 00006340
0428 032 0429 032 0430 032 0431 032 0432 269 0501 084 00006350
0502 056 0503 154 0504 000 0505 056 0506 263 0507 355 00006360
0508 034 0601 021 0602 021 0603 009 0604 037 0605 000 00006370
0606 000 0607 006 0608 028 0609 049 0610 009 0611 000 00006380
0612 076 0613 000 0614 181 0615 000 0616 003 0617 000 00006390
0618 075 0619 006 0620 035 0621 177 0622 012 0623 312 00006400
0701 006 0702 004 0703 028 0704 000 0705 000 0706 142 00006410
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0707	004	0708	014	0709	201	0710	043	0711	000	0712	128	00006420
0713	026	0714	011	0715	000	0716	028	0717	004	0718	028	00006430
0719	014	0720	004	0721	000	0722	260	0801	125	0802	000	00006440
0803	000	0804	000	0805	875	0901	150	0902	090	0903	045	00006450
0904	009	0905	000	0906	090	0907	150	0908	084	0909	000	00006460
0910	048	0911	084	0912	000	0913	000	0914	000	0915	009	00006470
0916	240	1001	075	1002	000	1003	301	1004	000	1005	226	00006480
1006	000	1007	023	1008	075	1009	000	1010	075	1011	226	00006490
1101	148	1102	000	1103	106	1104	000	1105	053	1106	032	00006500
1107	034	1108	000	1109	053	1110	000	1111	000	1112	000	00006510
1113	575	1201	000	1202	000	1203	000	1204	021	1205	979	00006520
1301	187	1302	094	1303	000	1304	094	1305	028	1306	000	00006530
1307	028	1308	566	1401	043	1402	157	1403	000	1404	235	00006540
1405	043	1406	217	1407	000	1408	261	1409	043	1410	000	00006550
1411	000	1501	069	1502	013	1503	004	1504	013	1505	000	00006560
1506	000	1507	000	1508	000	1509	000	1510	013	1511	000	00006570
1512	000	1513	104	1514	013	1515	007	1516	104	1517	026	00006580
1518	004	1519	052	1520	052	1521	004	1522	007	1523	000	00006590
1524	000	1525	000	1526	515	1601	000	1602	057	1603	038	00006600
1604	019	1605	114	1606	011	1607	000	1608	000	1609	011	00006610
1610	011	1611	076	1612	000	1613	011	1614	000	1615	650	00006620
1701	159	1702	079	1703	000	1704	159	1705	000	1706	238	00006630
1707	079	1708	000	1709	119	1710	024	1711	024	1712	000	00006640
1713	000	1714	119	1801	000	1802	000	1803	000	1804	217	00006650
1805	000	1806	785	1807	000	1901	014	1902	043	1903	058	00006660
1904	242	1905	000	1906	041	1907	047	1908	041	1909	041	00006670
1910	061	1911	061	1912	000	1913	021	1914	020	1915	310	00006680
2001	149	2002	053	2003	000	2004	066	2005	066	2006	020	00006690
2007	086	2008	510									00006700
30	FUNCTION		FN46,L241		PROB	ARCRW	GRD	ABORT/MA	DURING	AIRCREW		00006710
0101	000	0102	000	0103	000	0104	000	0105	000	0106	000	00006720
0107	000	0108	500	0109	000	0110	000	0111	000	0112	000	00006730
0113	000	0114	000	0115	333	0116	000	0201	000	0202	999	00006740
0203	000	0204	000	0205	000	0301	000	0302	000	0303	000	00006750
0304	000	0305	000	0401	000	0402	500	0403	000	0404	000	00006760
0405	000	0406	000	0407	000	0408	000	0409	000	0410	000	00006770
0411	000	0412	000	0413	000	0414	000	0415	500	0416	000	00006780
0417	000	0418	000	0419	000	0420	000	0421	000	0422	000	00006790
0423	000	0424	000	0425	000	0501	000	0502	000	0503	000	00006800
0504	000	0505	000	0506	333	0507	400	0508	000	0509	000	00006810
0510	000	0511	000	0512	000	0513	000	0514	000	0515	000	00006820
0516	000	0517	000	0601	000	0602	000	0603	000	0604	000	00006830
0605	000	0606	250	0607	222	0608	500	0609	000	0610	000	00006840
0611	500	0612	000	0613	000	0614	667	0615	000	0616	667	00006850
0617	000	0618	999	0701	000	0702	000	0703	000	0704	500	00006860
0705	000	0706	000	0707	000	0708	000	0709	000	0710	000	00006870
0711	000	0712	000	0713	000	0714	000	0715	000	0716	000	00006880
0717	000	0718	000	0719	999	0720	000	0721	000	0722	000	00006890
0723	000	0724	500	0725	000	0801	000	0802	500	0803	000	00006900
0804	000	0805	000	0806	500	0807	000	0808	000	0809	000	00006910
0810	000	0811	000	0812	500	0813	000	0814	000	0815	000	00006920
0816	999	0817	999	0818	000	0819	000	0820	000	0821	000	00006930
0901	000	0902	000	0903	000	0904	000	0905	000	0906	000	00006940
0907	000	0908	000	1001	999	1002	000	1003	000	1004	999	00006950
1005	200	1006	833	1007	999	1008	999	1009	500	1010	000	00006960
1011	000	1012	000	1013	000	1014	999	1015	000	1016	000	00006970
1017	000	1018	000	1019	000	1101	999	1102	000	1103	999	00006980
1104	000	1105	000	1106	000	1107	999	1108	000	1109	000	00006990
1110	000	1201	000	1202	999	1203	000	1204	000	1205	000	00007000
1206	000	1207	999	1208	000	1209	000	1301	000	1302	999	00007010
1303	999	1304	000	1305	000	1401	000	1402	000	1403	000	00007020
1404	999	1405	000	1406	000	1407	000	1408	000	1409	000	00007030
1410	000	1411	000	1501	000	1502	000	1503	000	1504	999	00007040
1505	000	1506	000	1507	000	1508	000	1509	000	1510	000	00007050
1511	000	1512	000	1513	000	1514	000	1515	000	1516	000	00007060
1517	000	1518	000	1519	000	1520	000	1521	000	1522	000	00007070

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1601  000   1602  000   1603  000   1701  000   1702  000   1703  000   00007080
1801  000   1802  000   1803  000   1901  000   1902  000   1903  000   00007090
1904  000   1905  999   1906  999   2001  000   2002  000   2003  999   00007100
2101  000   2201  500   2202  000   2203  000   2301  000   2401  999   00007110
2501  000                                                               00007120
*                                                                       00007130
*                                                                       00007140
 31    FUNCTION   P19,E4          PROB OF NORM SORT                     00007150
2      FN34  5    FN33  6    FN32  16   FN35                            00007160
*                                                                       00007170
*                                                                       00007180
 32    FUNCTION   FN46,L296     PROB NOR/MA IN-FLIGHT NO ABORT           00007190
0101  0000000102  0000000103  0000000104  0000000105  0000000106  00000000007200
0107  0000000108  0000000109  0000000110  0000000111  0000000112  00000000007210
0113  0000000114  0000000115  0000000116  0000000117  0000000118  00000000007220
0119  0000000120  1111110201  0000000202  0000000203  0000000204  00000000007230
0205  0000000206  0000000207  0000000208  0000000209  0000000210  00000000007240
0211  0000000212  2000000213  0000000214  0000000215  0000000216  99999900007250
0217  9999990218  0000000219  0000000220  0000000221  0000000222  00000000007260
0223  0000000224  2222220301  0000000302  0000000303  0000000304  00000000007270
0305  0000000306  0000000307  0000000308  0000000309  0000000310  00000000007280
0311  0000000312  0000000313  0000000401  3333330402  0000000403  00000000007290
0404  0000000405  0000000406  0000000407  0000000408  0000000409  00000000007300
0410  9999990411  0000000412  0000000413  0000000414  0000000415  00000000007310
0416  0000000417  0000000418  0000000419  0000000420  0000000421  00000000007320
0422  0000000423  0000000424  0000000425  0000000426  0000000427  00000000007330
0428  0000000429  0000000430  0000000431  0000000432  1923080501  00000000007340
0502  0000000503  4615380504  0000000505  0000000506  0000000507  00000000007350
0508  0000000601  0000000602  0000000603  9999990604  8888880605  00000000007360
0606  9999990607  0000000608  0000000609  0000000610  0000000611  00000000007370
0612  0000000613  9999990614  2727270615  0000000616  0000000617  00000000007380
0618  0000000619  1428570620  0000000621  9999990622  0000000623  12500000007390
0701  9999990702  0000000703  0000000704  0000000705  0000000706  50000000007400
0707  3333330708  3333330709  2000000710  3333330711  3333330712  33333300007410
0713  9999990714  0000000715  0000000716  0000000717  0000000718  00000000007420
0719  0000000720  0000000721  0000000722  0625000801  0000000802  16666700007430
0803  0000000804  3333330805  0000000901  0000000902  0000000903  00000000007440
0904  0000000905  0000000906  0000000907  5000000908  9999990909  00000000007450
0910  0000000911  0000000912  0000000913  0000000914  0000000915  00000000007460
0916  1111111001  0000001002  0000001003  5000001004  0000001005  46153800007470
1006  2500001007  1566671008  0000001009  0000001010  0000001011  28571400007480
1101  2000001102  0000001103  3333331104  9999991105  9999991106  00000000007490
1107  0000001108  5000001109  0000001110  0000001111  0000001112  00000000007500
1113  4594591201  0000001202  0000001203  0000001204  5000001205  33333300007510
1301  0000001302  0000001303  0000001304  0000001305  3333331306  00000000007520
1307  0000001308  0909091401  0000001402  0000001403  0000001404  66666700007530
1405  0000001406  0000001407  9999991408  9999991409  9999991410  00000000007540
1411  2500001501  2000001502  0000001503  0000001504  0000001505  00000000007550
1506  0000001507  0000001508  0000001509  0000001510  0000001511  00000000007560
1512  0000001513  0000001514  0000001515  0000001516  0000001517  00000000007570
1518  0000001519  0434781520  1000001521  9999991522  5000001523  00000000007580
1524  0000001525  0000001526  0303031601  0000001602  0689661603  99999900007590
1604  0000001605  0000001606  1428571607  0000001608  0000001609  00000000007600
1610  0000001611  1111111612  2307691613  0000001614  0000001615  18333300007610
1701  0000001702  0000001703  0000001704  0000001705  0000001706  00000000007620
1707  0000001708  0000001709  0000001710  0000001711  0000001712  00000000007630
1713  0000001714  0000001801  0000001802  0000001803  0000001804  00000000007640
1805  0000001806  0000001807  0000001901  0000001902  2500001903  00000000007650
1904  9999991905  1250001906  0588241907  0000001908  2000001909  20000000007660
1910  3000001911  3000001912  0000001913  0000001914  9999991915  11111100007670
2001  0000002002  8000002003  6666672004  3333332005  5000002006  66666700007680
2007  5000002008  777777                                            00007690
*                                                                   00007700
*                                                                   00007710
 33    FUNCTION   P22,D241      PROB NOR/MA NO ABORT AIRCREW          00007720
0101  9999990102  0000000103  5000000104  9999990105  0000000106  50000000007730
```

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0107 8000000108 9999990109 5000000110 9999990111 2500000112 0000000007740
0113 9999990114 5000000115 0000000116 9999990201 0000000202 0000000007750
0203 0000000204 0000000205 0000000301 0000000302 9999990303 0000000007760
0304 9999990305 0000000401 0000000402 0000000403 0000000404 0000000007770
0405 0000000406 0000000407 0000000408 0000000409 0000000410 0000000007780
0411 9999990412 0000000413 0000000414 0000000415 9999990416 0000000007790
0417 0000000418 0000000419 0000000420 0000000421 9999990422 0000000007800
0423 0000000424 0000000425 0000000501 7500000502 9999990503 0000000007810
0504 0000000505 0000000506 9999990507 6666670508 0000000509 0000000007820
0510 0000000511 0000000512 0000000513 0000000514 0000000515 0000000007830
0516 0000000517 0000000601 0000000602 0000000603 0000000604 0000000007840
0605 6666670606 3333330607 7142860608 9999990609 0000000610 0000000007850
0611 6666670612 9999990613 2222220614 9999990615 0000000616 0000000007860
0617 0000000618 0000000701 5000000702 0000000703 9999990704 9999990000 7870
0705 0000000706 0000000707 0000000708 6666670709 0000000710 0000000007880
0711 0000000712 9999990713 0000000714 0000000715 9999990716 9999990007890
0717 0000000718 9999990719 0000000720 0000000721 0000000722 0000000007900
0723 0000000724 9999990725 0000000801 0000000802 0000000803 6666670000 7910
0804 0000000805 0000000806 9999990807 0000000808 5000000809 0000000007920
0810 0000000811 0000000812 0000000813 0000000814 0000000815 0000000007930
0816 0000000817 0000000818 6666670819 0000000820 0000000821 0000000007940
0901 9999990902 0000000903 0000000904 9999990905 0000000906 0000000007950
0907 0000000908 0000001001 0000001002 9999991003 0000001004 0000000007960
1005 5000001006 0000001007 0000001008 0000001009 0000001010 0000000007970
1011 0000001012 0000001013 0000001014 0000001015 0000001016 0000000007980
1017 0000001018 0000001019 0000001101 0000001102 0000001103 0000000007990
1104 0000001105 0000001106 0000001107 0000001108 0000001109 3333330008000
1110 0000001201 0000001202 0000001203 0000001204 0000001205 0000000008010
1206 0000001207 0000001208 0000001209 0000001301 0000001302 0000000008020
1303 0000001304 0000001305 0000001401 0000001402 0000001403 0000000008030
1404 0000001405 0000001406 0000001407 0000001408 0000001409 0000000008040
1410 0000001411 0000001501 9999991502 0000001503 0000001504 0000000008050
1505 0000001506 0000001507 0000001508 0000001509 0000001510 0000000008060
1511 0000001512 0000001513 0000001514 0000001515 0000001516 0000000008070
1517 0000001518 0000001519 0000001520 0000001521 0000001522 0000000008080
1601 0000001602 0000001603 0000001701 0000001702 0000001703 0000000008090
1801 0000001802 0000001803 0000001901 0000001902 0000001903 0000000008100
1904 0000001905 0000001906 0000002001 0000002002 0000002003 0000000008110
2101 0000002201 9999992202 0000002203 0000002301 0000002401 0000000008120
2501 000000                                                  00008130
*                                                            00008140
*                                                            00008150
 34   FUNCTION    FN46,L296     PROB NOR/MA PREFLIGHT         00008160
0101 0000000102 0000000103 0000000104 0000000105 0000000106 0000000008170
0107 0000000108 0000000109 0000000110 0000000111 0000000112 9999990008180
0113 0000000114 0000000115 0000000116 0000000117 0000000118 0000000008190
0119 0000000120 1368420201 0000000202 0000000203 0000000204 0000000008200
0205 0000000206 0000000207 0000000208 0000000209 0000000210 0000000008210
0211 0000000212 5000000213 0000000214 0000000215 0000000216 1875000008220
0217 0000000218 0000000219 0000000220 0000000221 0000000222 0000000008230
0223 0000000224 1093700301 0000000302 0000000303 0000000304 0000000008240
0305 0000000306 0000000307 0000000308 0000000309 0000000310 0000000008250
0311 0000000312 0000000313 2352940401 5555550402 9999990403 0000000008260
0404 0000000405 7692300406 0000000407 0000000408 5555550409 9999990008270
0410 0000000411 0000000412 0000000413 9999990414 5777770415 0000000008280
0416 0000000417 0000000418 0000000419 0000000420 0000000421 0000000008290
0422 0000000423 0000000424 0000000425 0000000426 0000000427 0000000008300
0428 9705880429 9705880430 9705880431 9705880432 6842110501 0000000008310
0502 0000000503 0000000504 0000000505 0000000506 0000000507 0000000008320
0508 4347830601 0000000602 0000000603 0000000604 0000000605 0000000008330
0606 0000000607 0000000608 0000000609 0000000610 0000000611 0000000008340
0612 4800000613 0000000614 0454550615 0000000616 0000000617 0000000008350
0618 0000000619 0000000620 0000000621 0000000622 4225350623 4840180008360
0701 0000000702 0000000703 0000000704 0000000705 9999990706 0000000008370
0707 0000000708 0000000709 0000000710 0000000711 0000000712 0000000008380
0713 5555550714 0000000715 0000000716 0000000717 0000000718 0000000008390
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0719  0000000720  0000000721  0000000722  0652170801  0000000802  0000000008400
0803  0000000804  0000000805  0000000901  0000000902  0000000903  0000000008410
0904  0000000905  0000000906  0000000907  0000000908  0000000909  0000000008420
0910  0000000911  0000000912  0000000913  0000000914  0000000915  0000000008430
0916  0000001001  0000001002  9999991003  0000001004  0000001005  0000000008440
1006  0000001007  0000001008  0000001009  0000001010  0000001011  0000000008450
1101  0000001102  0000001103  5000001104  3333331105  0000001106  0000000008460
1107  0000001108  0000001109  0000001110  0000001111  0000001112  0000000008470
1113  2000001201  0000001202  0000001203  4347831204  0000001205  0000000008480
1301  0000001302  0000001303  0000001304  0000001305  0000001306  0000000008490
1307  0000001308  0000001401  0000001402  0000001403  0000001404  0000000008500
1405  5000001406  0000001407  0000001408  0000001409  0000001410  0000000008510
1411  0000001501  0000001502  0000001503  0000001504  0000001505  0000000008520
1506  0000001507  0000001508  0000001509  0000001510  0000001511  0000000008530
1512  0000001513  0000001514  0000001515  0000001516  0000001517  0000000008540
1518  0000001519  0000001520  0000001521  0000001522  0000001523  0000000008550
1524  0000001525  0000001526  1313131601  0000001602  0000001603  0000000008560
1604  0000001605  0000001606  0000001607  0000001608  0000001609  0000000008570
1610  0000001611  0000001612  0000001613  0000001614  0000001615  0909090008580
1701  0000001702  0000001703  0000001704  0000001705  0000001706  0000000008590
1707  0000001708  0000001709  0000001710  0000001711  0000001712  0000000008600
1713  0000001714  0000001801  0000001802  0000001803  0000001804  0000000008610
1805  0000001806  0000001807  0000001901  0000001902  0000001903  0000000008620
1904  0000001905  0000001906  0000001907  0000001908  0000001909  0000000008630
1910  0000001911  0000001912  0000001913  0000001914  0000001915  2978720008640
2001  0000002002  0000002003  0000002004  0000002005  0000002006  0000000008650
2007  0000002008  000000                                          00008660
*                                                               00008670
*                                                               00008680
 35    FUNCTION    FN46,L296     PROB NUR/MA DAILY                00008690
0101  0000000102  0000000103  0000000104  0000000105  0000000106  0000000008700
0107  0000000108  0000000109  0000000110  0000000111  0000000112  9999990008710
0113  0000000114  0000000115  0000000116  0000000117  0000000118  0000000008720
0119  0000000120  0842110201  0000000202  0000000203  0000000204  0000000008730
0205  0000000206  0000000207  0000000208  0000000209  0000000210  0000000008740
0211  0000000212  0000000213  0000000214  0000000215  0000000216  2179490008750
0217  0000000218  0000000219  0000000220  0000000221  0000000222  0000000008760
0223  0000000224  1085530301  0000000302  0000000303  0000000304  0000000008770
0305  0000000306  0000000307  0000000308  0000000309  0000000310  0000000008780
0311  0000000312  0000000313  0000000401  5555550402  0000000403  0000000008790
0404  0980396405  0000000406  0000000407  0000000408  0000000409  0000000008800
0410  0869570411  0000000412  0000000413  0000000414  1176470415  0000000008810
0416  0000000417  0000000418  0000000419  0000000420  0000000421  0000000008820
0422  0000000423  0000000424  0000000425  0000000426  0000000427  0000000008830
0428  1910110429  1910110430  1910110431  1910110432  0873440501  0000000008840
0502  0000000503  0000000504  0000000505  0000000506  6250000507  0000000008850
0508  0000000601  0000000602  1709400603  0000000604  3333330605  4000000008860
0606  0000000607  0000000608  0000000609  0000000610  0000000611  0000000008870
0612  0919540613  0000000614  0566426615  0000000616  0000000617  0000000008880
0618  0833330619  0000000620  0000000621  0000000622  0000000623  0613720008890
0701  5000000702  2222220703  0000000704  0000000705  0000000706  0552490008900
0707  0000000708  0000000709  6250000710  0000000711  0000000712  2222220008910
0713  1851850714  0000000715  0000000716  0000000717  0000000718  0000000008920
0719  0000000720  0000000721  0000000722  0680000801  0000000802  0000000008930
0803  0000000804  0000000805  0000000901  0000000902  0000000903  0000000008940
0904  0000000905  0000000906  0000000907  0000000908  0000000909  0000000008950
0910  0000000911  0000000912  0000000913  0000000914  0000000915  0000000008960
0916  0000001001  0000001002  0000001003  0000001004  0000001005  0000000008970
1006  0000001007  0000001008  0000001009  9999991010  0000001011  3333330008980
1101  0000001102  0000001103  0000001104  0000001105  0000001106  0000000008990
1107  0000001108  0000001109  0000001110  0000001111  0000001112  0000000009000
1113  1439511201  0000001202  0000001203  0000001204  0000001205  0000000009010
1301  0000001302  0000001303  0000001304  0000001305  0000001306  0000000009020
1307  0000001308  0000001401  0000001402  0000001403  0000001404  7692310009030
1405  9999991406  0000001407  3333331408  0000001409  0000001410  0000000009040
1411  0528221501  0000001502  0000001503  0000001504  0000001505  0000000009050
```

```
1506 0000001507 0000001508 0000001509 0000001510 0000001511 000000000009060
1512 0000001513 0000001514 0000001515 0000001516 0000001517 000000000009070
1518 0000001519 0000001520 0000001521 0000001522 0000001523 000000000009080
1524 0000001525 0000001526 0280001601 0000001602 0000001603 000000000009090
1604 0000001605 0000001606 0000001607 0000001608 0000001609 000000000009100
1610 0000001611 0000001612 5000001613 0000001614 0000001615 093023000009110
1701 0000001702 0000001703 0000001704 0000001705 0000001706 000000000009120
1707 0000001708 0000001709 0000001710 0000001711 0000001712 000000000009130
1713 0000001714 0000001801 0000001802 0000001803 0000001804 000000000009140
1805 0000001806 0000001807 0000001901 0763361902 2666671903 000000000009150
1904 0000001905 0000001906 0000001907 1666671908 0000001909 000000000009160
1910 1666661911 1666661912 0000001913 2358491914 3030301915 149733000009170
2001 0000002002 0000002003 0000002004 9999992005 0000002006 000000000009180
2007 0000002008 171674                                              00009190
*                                                                   00009200
*                                                                   00009210
 36    FUNCTION    FN35,L235      LOG NORMAL DISTRIBUTION            00009220
0      0     .025  332   .050  388   .100  466   .150  527   .200  580  00009230
.250   631   .300  680   .400  779   .500  883   .600  1003  .700  1148 00009240
.750   1237  .800  1345  .850  1482  .900  1675  .920  1782  .940  1921 00009250
.960   2119  .970  2261  .980  2465  .990  2845  .995  3200  .999  4183 00009260
.9998  5185                                                         00009270
*                                                                   00009280
 37    FUNCTION    FN46,L296      PERCENT REM & REPL,PERCENT GS RPR/RCD 00009290
0101 9990000102 9990000103 9990000104 5000000105 0000000106 000000000009300
0107 0000000108 9990000109 9990000110 9990000111 0000000112 000000000009310
0113 9990000114 9990000115 0000000116 0000000117 5000000118 000000000009320
0119 9990000120 5800000201 9990000202 9990000203 0000000204 999000000009330
0205 9990000206 9990000207 9990000208 9990000209 9990000210 999000000009340
0211 9990000212 8240000213 9990000214 8820000215 8180000216 769000000009350
0217 9720000218 9990000219 9990000220 9990000221 9990000222 999000000009360
0223 9990000224 8040000301 9990000302 9990000303 9990000304 667000000009370
0305 9990000306 9990000307 9990000308 9990000309 9990000310 999000000009380
0311 9990000312 9990000313 8410000401 2860000402 0000000403 000000000009390
0404 2380000405 0910000406 9990000407 3000000408 0000000409 923000000009400
0410 9090000411 8390000412 8570000413 9990000414 0000000415 999000000009410
0416 9990000417 9990000418 9990000419 8330000420 8330000421 833000000009420
0422 8330000423 8330000424 8330000425 9990000426 9990000427 999000000009430
0428 8110000429 8110000430 8110000431 8110000432 6130000501 999000000009440
0502 8750000503 9990000504 9990000505 9990000506 9990000507 947000000009450
0508 8240001601 9990000602 9290000603 9990000604 3640000605 250000000009460
0606 9990000607 5000000608 7500000609 5000000610 9990000611 999000000009470
0612 2640000613 9990000614 6830000615 9990000616 9990000617 999000000009480
0618 7500000619 9990000620 9990000621 6880000622 5000000623 652000000009490
0701 9990000702 9990000703 3330000704 6670000705 9990000706 879000000009500
0707 0000000708 9990000709 8890000710 9990000711 8000000712 682000000009510
0713 9990000714 9990000715 5000000716 9990000717 9990000718 999000000009520
0719 5000000720 5000000721 9990000722 6020000801 9990000802 999000000009530
0803 9330000804 9230000805 9380000901 2860000902 8890000903 999000000009540
0904 9990000905 9990000906 9990000907 9990000908 9990000909 999000000009550
0910 9990000911 9990000912 9990000913 9990000914 9990000915 999000000009560
0916 8110001001 0000001002 9990001003 6670001004 0000001005 625000000009570
1006 0000001007 8180001008 9990001009 9990001010 0000001011 786000000009580
1101 6540001102 0000001103 8820001104 8330001105 9990001106 750000000009590
1107 9990001108 9990001109 9990001110 9990001111 6670001112 857000000009600
1113 8810001201 7780001202 9990001203 9990001204 5000001205 907000000009610
1301 9990001302 9990001303 9990001304 6000001305 9990001306 833000000009620
1307 8890001308 7780001401 9990001402 9990001403 9990001404 833000000009630
1405 9990001406 9990001407 9990001408 9990001409 9990001410 999000000009640
1411 5530001501 9630001502 7140001503 8330001504 6670001505 667000000009650
1506 9990001507 9990001508 5000001509 9990001510 7500001511 800000000009660
1512 9990001513 6000001514 9990001515 9990001516 9990001517 600000000009670
1518 7500001519 5490001520 9380001521 9990001522 7140001523 667000000009680
1524 5710001525 5710001526 7150001601 7780001602 9740001603 999000000009690
1604 7860001605 6000001606 0000001607 5000001608 6000001609 999000000009700
1610 8570001611 9990001612 9990001613 6670001614 9990001615 765000000009710
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1701 6670001702 9990001703 9990001704 9090001705 9990001706 00000000009720
1707 6670001708 9990001709 9420001710 9990001711 1670001712 66700000009730
1713 9990001714 6470001801 9570001802 9990001803 8400001804 99900000009740
1805 7500001806 9990001807 7500001901 9990001902 9990001903 50000000009750
1904 9990001905 9990001906 8750001907 6360001908 8570001909 85700000009760
1910 5710001911 5710001912 0000001913 0500001914 9990001915 56700000009770
2001 7860002002 9990002003 8330002004 5000002005 6670002006 50000000009780
2007 5000002008 873000                                                00009790
 38   FUNCTION   FN46,L296   PROB OF PART AVAILABILITY                  00009800
0101 999 0102 999 0103 999 0104 999 0105 999 0106 999                  00009810
0107 999 0108 999 0109 999 0110 999 0111 999 0112 999                  00009820
0113 999 0114 999 0115 999 0116 999 0117 999 0118 999                  00009830
0119 999 0120 909 0201 995 0202 999 0203 999 0204 999                  00009840
0205 999 0206 999 0207 999 0208 999 0209 999 0210 999                  00009850
0211 999 0212 857 0213 999 0214 733 0215 999 0216 999                  00009860
0217 800 0218 999 0219 400 0220 999 0221 999 0222 999                  00009870
0223 999 0224 932 0301 999 0302 999 0303 000 0304 999                  00009880
0305 999 0306 000 0307 999 0308 999 0309 999 0310 999                  00009890
0311 999 0312 999 0313 854 0401 000 0402 999 0403 999                  00009900
0404 000 0405 999 0406 999 0407 272 0408 999 0409 600                  00009910
0410 867 0411 143 0412 999 0413 999 0414 999 0415 000                  00009920
0416 999 0417 833 0418 667 0419 500 0420 500 0421 500                  00009930
0422 500 0423 500 0424 500 0425 999 0426 999 0427 500                  00009940
0428 600 0429 600 0430 600 0431 600 0432 800 0501 667                  00009950
0502 429 0503 724 0504 999 0505 999 0506 999 0507 999                  00009960
0508 857 0601 999 0602 900 0603 999 0604 999 0605 999                  00009970
0606 999 0607 999 0608 999 0609 999 0610 999 0611 000                  00009980
0612 963 0613 999 0614 804 0615 999 0616 999 0617 800                  00009990
0618 694 0619 999 0620 999 0621 875 0622 833 0623 843                  00010000
0701 999 0702 875 0703 999 0704 999 0705 999 0706 999                  00010010
0707 999 0708 889 0709 919 0710 976 0711 999 0712 630                  00010020
0713 700 0714 999 0715 999 0716 000 0717 999 0718 999                  00010030
0719 999 0720 999 0721 999 0722 538 0801 999 0802 714                  00010040
0803 999 0804 583 0805 923 0901 999 0902 999 0903 999                  00010050
0904 999 0905 500 0906 750 0907 667 0908 750 0909 999                  00010060
0910 999 0911 980 0912 999 0913 999 0914 999 0915 999                  00010070
0916 873 1001 999 1002 999 1003 999 1004 999 1005 556                  00010080
1006 999 1007 999 1008 999 1009 999 1010 999 1011 400                  00010090
1101 000 1102 999 1103 000 1104 000 1105 999 1106 167                  00010100
1107 800 1108 875 1109 999 1110 999 1111 999 1112 636                  00010110
1113 787 1201 999 1202 864 1203 999 1204 999 1205 806                  00010120
1301 857 1302 999 1303 999 1304 999 1305 857 1306 400                  00010130
1307 750 1308 722 1401 000 1402 999 1403 999 1404 600                  00010140
1405 999 1406 999 1407 500 1408 000 1409 000 1410 999                  00010150
1411 250 1501 962 1502 999 1503 999 1504 999 1505 500                  00010160
1506 999 1507 000 1508 000 1509 999 1510 999 1511 999                  00010170
1512 600 1513 999 1514 999 1515 999 1516 999 1517 999                  00010180
1518 333 1519 500 1520 933 1521 999 1522 999 1523 999                  00010190
1524 000 1525 000 1526 808 1601 867 1602 639 1603 999                  00010200
1604 909 1605 719 1606 999 1607 999 1608 999 1609 200                  00010210
1610 667 1611 999 1612 500 1613 999 1614 999 1615 855                  00010220
1701 999 1702 999 1703 999 1704 950 1705 999 1706 999                  00010230
1707 999 1708 999 1709 959 1710 999 1711 999 1712 999                  00010240
1713 999 1714 900 1801 909 1802 500 1803 999 1804 999                  00010250
1805 999 1806 999 1807 333 1901 999 1902 774 1903 750                  00010260
1904 143 1905 400 1906 900 1907 333 1908 000 1909 000                  00010270
1910 650 1911 650 1912 999 1913 999 1914 250 1915 843                  00010280
2001 818 2002 900 2003 999 2004 667 2005 999 2006 999                  00010290
2007 667 2008 933                                                      00010300
 39   FUNCTION   P1,E3        VARIABLE SORT FOR WORK CENTER             00010310
 1    V50  2     V49  3     V48                                        00010320
 *                                                                     00010330
 *                                                                     00010340
 40   FUNCTION   FN46,L296   SKILL CODE-WORK CENTER ON A/C REPAIR       00010350
0101 0000000102 0000000103 0000000104 0000030105 0003070106 0003070010360
0107 0003070108 0000000109 0000000110 0000000111 0000070112 0001030010370
```

```
0113  0000000114  0000000115  0003070116  0003070117  0000070118  0000070001 0380
0119  0000000120  0007030201  0000000202  0000000203  0000030204  0000000001 0390
0205  0000000206  0000000207  0000000208  0000000209  0000000210  0000000001 0400
0211  0000000212  0000030213  0000000214  0000030215  0000100216  0003020001 0410
0217  0000030218  0000000219  0000000220  0000000221  0000000222  0000000001 0420
0223  0000000224  0000030301  0000000302  0000000303  0000000304  0000030001 0430
0305  0000000306  0000000307  0000000308  0000000309  0000000310  0000000001 0440
0311  0000000312  0000000313  0010030401  0002030402  0000030403  0002030001 0450
0404  0006030405  0006030406  0000000407  0001030408  0001030409  0000300001 0460
0410  0005030411  0003060412  0000030413  0000000414  0001030415  0000000001 0470
0416  0000000417  0000000418  0000000419  0000090420  0000090421  0000090001 0480
0422  0000090423  0000090424  0000090425  0000000426  0000000427  0000000001 0490
0428  0006070429  0006070430  0006070431  0006070432  0002030501  0000000001 0500
0502  0000030503  0000000504  0000000505  0000000506  0000000507  0000100001 0510
0508  0007030601  0000000602  0000030603  0000000604  0001030605  0006030001 0520
0606  0000000607  0000030608  0000030609  0001030610  0000000611  0000000001 0530
0612  0000030613  0000000614  0009030615  0000000616  0000000617  0000000001 0540
0618  0008030619  0000000620  0000000621  0008070622  0000930623  0006300001 0550
0701  0000000702  0000000703  0000070704  0000030705  0000000706  0002030001 0560
0707  0009030708  0000000709  0009030710  0000000711  0000030712  0003090001 0570
0713  0000000714  0000000715  0000030716  0000000717  0000000718  0000000001 0580
0719  0000030720  0000030721  0000000722  0009030801  0000000802  0000000001 0590
0803  0000030804  0000100805  0000080901  0003080902  0000040903  0000000001 0600
0904  0000006905  0000000906  0000000907  0000000908  0000000909  0000000001 0610
0910  0000000911  0000000912  0000000913  0000000914  0000000915  0000000001 0620
0916  0003081001  0002071002  0000001003  0003081004  0000031005  0002040001 0630
1006  0008051007  0008051008  0000001009  0000001010  0000031011  0003050001 0640
1101  0010031102  0005031103  0000031104  0000031105  0000001106  0003020001 0650
1107  0000001108  0000001109  0000001110  0000001111  0000031112  0000030001 0660
1113  0008031201  0008031202  0000001203  0000001204  0000031205  0008030001 0670
1301  0000001302  0000001303  0000001304  0000071305  0000001306  0000040001 0680
1307  0000041308  0008031401  0000001402  0000001403  0000001404  0000030001 0690
1405  0000001406  0000001407  0000001408  0000001409  0000001410  0000000001 0700
1411  0008031501  0000031502  0000081503  0000091504  0000081505  0000040001 0710
1506  0000001507  0000001508  0000041509  0000001510  0000081511  0000080001 0720
1512  0000001513  0010041514  0000001515  0000001516  0000001517  0000080001 0730
1518  0000021519  0009081520  0010031521  0000001522  0000081523  0006080001 0740
1524  0003081525  0006101526  0008031601  0000101602  0000041603  0000000001 0750
1604  0000041605  0000041606  0000041607  0000041608  0000041609  0000000001 0760
1610  0000041611  0000001612  0000001613  0000041614  0000001615  0000040001 0770
1701  0004031702  0000001703  0000001704  0000041705  0000001706  0000040001 0780
1707  0000041708  0000001709  0000041710  0000001711  0001041712  0000040001 0790
1713  0000001714  0000041801  0000041802  0000001803  0000041804  0000000001 0800
1805  0000041806  0000001807  0000041901  0000001902  0000001903  0000070001 0810
1904  0000001905  0000001906  0010081907  0009011908  0010091909  0010090001 0820
1910  0009031911  0009031912  0002031913  0009071914  0000001915  0009030001 0830
2001  0006032002  0000002003  0000092004  0008032005  0000032006  0003090001 0840
2007  0006032008  000203                                                    0001 0850
*                                                                           0001 0860
*                                                                           0001 0870
 41    FUNCTION    P1,E3       VARIABLE SORT MANPOWER DEFINITION            0001 0880
1      V54   2     V53   3     V52                                          0001 0890
*                                                                           0001 0900
*                                                                           0001 0910
 42    FUNCTION    FN46,L296   MPR REMOVE & REPLACE 2NDARY WC, PRIMARY WC   0001 0920
0101  0000100102  0002160103  0006050104  0006040105  0000000106  0000000001 0930
0107  0006060108  0006100109  0004060110  0006040111  0000000112  0000000001 0940
0113  0000200114  0000200115  0000000116  0000000117  0010100118  0000000001 0950
0119  0000100120  0004120201  0000170202  0004060203  0000000204  0001300001 0960
0205  0006060206  0000150207  0002080208  0005150209  0006100210  0001170001 0970
0211  0004060212  0001170213  0006040214  0001090215  0004060216  0004210001 0980
0217  0006190218  0000260219  0006100220  0000100221  0000130222  0000100001 0990
0223  0002090224  0001120301  0000100302  0000100303  0000100304  0000100001 1000
0305  0000100306  0000110307  0000200308  0000100309  0000200310  0005110001 1010
0311  0006100312  0000200313  0004140401  0001280402  0000000403  0000000001 1020
0404  0001290405  0000280406  0000120407  0001170408  0000000409  0000120001 1030
```

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0410 0001160411 0001150412 0000150413 0003170414 0000280415 0000110011040
0416 0000160417 0000190418 0000170419 0004200420 0004200421 0004200011050
0422 0004200423 0004200424 0004200425 0007130426 0004090427 0001120011060
0428 0003140429 0003140430 0003140431 0003140432 0014040501 0003100011070
0502 0000190503 0001120504 0000100505 0000100506 0002090507 0001090011080
0508 0003070601 0001150602 0004160603 0006130604 0004110605 0000300011090
0606 0001020607 0000100608 0001120609 0000300610 0000200611 0000200011100
0612 0000200613 0000140614 0002120615 0000100616 0000130617 0000100011110
0618 0001110619 0002080620 0002080621 0006070622 0002130623 0001110011120
0701 0002080702 0004080703 0000400704 0001090705 0008080706 0002150011130
0707 0000000708 0005090709 0007080710 0004090711 0006120712 0007080011140
0713 0003080714 0002080715 0000100716 0000100717 0000200718 0000100011150
0719 0000140720 0000100721 0000100722 0004090801 0002080802 0003070011160
0803 0003080804 0006040805 0005070901 0003070902 0000100903 0000100011170
0904 0000100905 0002100906 0001090907 0000100908 0003110909 0004060011180
0910 0001090911 0001090912 0005050913 0005050914 0000100915 0000100011190
0916 0006051001 0000001002 0002201003 0000171004 0000001005 0001200011200
1006 0000001007 0003121008 0000011009 0000141010 0000001011 0003110011210
1101 0002121102 0000001103 0004101104 0002111105 0004101106 0005050011220
1107 0006061108 0001081109 0000101110 0000201111 0000151112 0000110011230
1113 0001101201 0009011202 0000161203 0007041204 0001131205 0003090011240
1301 0001091302 0000101303 0000101304 0000101305 0000121306 0004070011250
1307 0006061308 0004071401 0000101402 0003071403 0005181404 0004130011260
1405 0000301406 0000101407 0000201408 0000201409 0002091410 0000100011270
1411 0009101501 0004061502 0000101503 0005071504 0003071505 0000100011280
1506 0000101507 0000101508 0000101509 0000101510 0004061511 0005050011290
1512 0003101513 0003071514 0000101515 0000111516 0000101517 0003070011300
1518 0002081519 0002111520 0005051521 0005051522 0001121523 0005050011310
1524 0002081525 0003071526 0002081601 0000111602 0001111603 0001090011320
1604 0000121605 0000121606 0000001607 0000151608 0000101609 0000100011330
1610 0002081611 0000111612 0000101613 0000181614 0000151615 0001100011340
1701 0003071702 0000171703 0001091704 0000101705 0000101706 0000000011350
1707 0003071708 0000101709 0003071710 0005051711 0000101712 0000100011360
1713 0000101714 0001101801 0000101802 0000101803 0001091804 0000200011370
1805 0004161806 0000131807 0000101901 0000101902 0001091903 0004110011380
1904 0004091905 0002081906 0003071907 0001191908 0009121909 0009120011390
1910 0008111911 0008111912 0000001913 0005161914 0008101915 0005100011400
2001 0003082002 0004072003 0002132004 0000202005 0000192006 0006080011410
2007 0005142008 000606                                              00011420
*                                                                   00011430
*                                                                   00011440
 43   FUNCTION   FN46,L296   OFF EQUIP MEMT,REM & REPLACE MEMT       00011450
0101 0000700102 0000590103 0000190104 0000090105 0000000106 0000000011460
0107 0000000108 0000460109 0000180110 0000230111 0000000112 0000000011470
0113 0000300114 0000300115 0000000116 0000000117 0000250118 0000000011480
0119 0000170120 0000180201 0000200202 0000170203 0000000204 0000160011490
0205 0000230206 0000180207 0000120208 0000200209 0000150210 0000350011500
0211 0000250212 0000220213 0000420214 0000210215 0000240216 0000180011510
0217 0000170218 0000340219 0000230220 0000100221 0000130222 0000230011520
0223 0000140224 0000200301 0000150302 0000150303 0000300304 0000150011530
0305 0000130306 0000230307 0000150308 0000150309 0000270310 0000240011540
0311 0000170312 0000120313 0000200401 0001750402 0000000403 0000000011550
0404 0002380405 0000150406 0000200407 0000580408 0000000409 0000180011560
0410 0000240411 0000260412 0000330413 0000200414 0000350415 0000130011570
0416 0000200417 0000590418 0000190419 0000260420 0000260421 0000260011580
0422 0000260423 0000260424 0000260425 0000230426 0000450427 0000160011590
0428 0000170429 0000170430 0000170431 0000170432 0000510501 0000120011600
0502 0000150503 0000240504 0000140505 0000100506 0000110507 0000160011610
0508 0000130601 0000840602 0001030603 0000470604 0002860605 0000400011620
0606 0000500607 0000050608 0000370609 0000500610 0003750611 0000220011630
0612 0000870613 0000700614 0000310615 0000360616 0000320617 0000120011640
0618 0000210619 0000120620 0000230621 0000440622 0000230623 0000210011650
0701 0000150702 0000170703 0000400704 0000050705 0000090706 0000170011660
0707 0000000708 0000370709 0000410710 0000480711 0000470712 0000200011670
0713 0000280714 0000170715 0000200716 0000100717 0000200718 0000130011680
0719 0000090720 0000220721 0000110722 0000230801 0000250802 0000440011690
```

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0803  0000120804  0000160805  0000160901  0000120902  0000130903  00000800011700
0904  0000120905  0000320906  0000220907  0000120908  0000120909  00001500011710
0910  0000070911  0000170912  0000190913  0000020914  0000050915  00002000011720
0916  0000191001  0000001002  0000451003  0000301004  0000001005  00013000011730
1006  0000001007  0000391008  0000201009  0002801010  0000001011  00003400011740
1101  0000251102  0000001103  0000281104  0000221105  0000151106  00001300011750
1107  0000081108  0000141109  0000651110  0000091111  0000351112  00002700011760
1113  0000151201  0000091202  0000151203  0000111204  0000551205  00002200011770
1301  0000091302  0000031303  0000031304  0000141305  0000121306  00001000011780
1307  0000071308  0000121401  0000151402  0000201403  0000131404  00006100011790
1405  0001731406  0000081407  0000651408  0000351409  0000431410  00000500011800
1411  0000431501  0000111502  0000061503  0000161504  0000101505  00001000011810
1506  0000101507  0000081508  0000101509  0000061510  0000041511  00000800011820
1512  0000091513  0000091514  0000101515  0000171516  0000261517  00001000011830
1518  0000091519  0000171520  0000071521  0000081522  0000111523  00001000011840
1524  0000081525  0000151526  0000101601  0000111602  0000101603  00002100011850
1604  0000121605  0000061606  0000001607  0000061608  0000111609  00000900011860
1610  0000111611  0000211612  0000161613  0000131614  0000151615  00001800011870
1701  0000141702  0000371703  0000141704  0000061705  0000081706  00000000011880
1707  0000101708  0000071709  0000071710  0000111711  0000101712  00000700011890
1713  0000091714  0000361801  0000061802  0000151803  0000101804  00007000011900
1805  0000211806  0000221807  0000061901  0000061902  0000111903  00018100011910
1904  0000221905  0000101906  0000121907  0001071908  0001081909  00010800011920
1910  0001931911  0001931912  0000001913  0001101914  0000781915  00004500011930
2001  0000392002  0000222003  0000092004  0000732005  0000232006  00001800011940
2007  0000672008  000020                                          00011950
*                                                                 00011960
 44    FUNCTION    FN46,L296    TEST HOP CANDIDATES                00011970
0101  0  0102  1  0103  0  0104  0  0105  0  0106  0              00011980
0107  0  0108  0  0109  0  0110  0  0111  0  0112  1              00011990
0113  1  0114  0  0115  0  0116  0  0117  0  0118  0              00012000
0119  0  0120  1  0201  0  0202  0  0203  0  0204  0              00012010
0205  0  0206  0  0207  0  0208  0  0209  0  0210  0              00012020
0211  0  0212  0  0213  0  0214  1  0215  0  0216  0              00012030
0217  0  0218  0  0219  0  0220  0  0221  0  0222  0              00012040
0223  0  0224  0  0301  0  0302  0  0303  0  0304  0              00012050
0305  0  0306  1  0307  0  0308  1  0309  1  0310  1              00012060
0311  0  0312  0  0313  1  0401  1  0402  1  0403  0              00012070
0404  0  0405  1  0406  1  0407  1  0408  0  0409  1              00012080
0410  1  0411  1  0412  0  0413  0  0414  1  0415  0              00012090
0416  1  0417  0  0418  0  0419  1  0420  1  0421  1              00012100
0422  1  0423  1  0424  1  0425  1  0426  0  0427  1              00012110
0428  1  0429  1  0430  1  0431  1  0432  1  0501  0              00012120
0502  0  0503  0  0504  0  0505  0  0506  0  0507  0              00012130
0508  0  0601  0  0602  0  0603  0  0604  1  0605  0              00012140
0606  1  0607  0  0608  0  0609  1  0610  1  0611  1              00012150
0612  1  0613  0  0614  1  0615  0  0616  0  0617  0              00012160
0618  0  0619  0  0620  0  0621  1  0622  1  0623  1              00012170
0701  0  0702  0  0703  1  0704  0  0705  0  0706  1              00012180
0707  1  0708  1  0709  1  0710  0  0711  1  0712  1              00012190
0713  0  0714  0  0715  0  0716  0  0717  0  0718  1              00012200
0719  0  0720  1  0721  0  0722  1  0801  0  0802  0              00012210
0803  0  0804  0  0805  1  0901  0  0902  0  0903  0              00012220
0904  0  0905  0  0906  0  0907  0  0908  0  0909  0              00012230
0910  0  0911  0  0912  0  0913  0  0914  0  0915  0              00012240
0916  0  1001  0  1002  1  1003  1  1004  0  1005  1              00012250
1006  0  1007  0  1008  0  1009  1  1010  0  1011  1              00012260
1101  1  1102  0  1103  1  1104  0  1105  0  1106  0              00012270
1107  0  1108  0  1109  0  1110  0  1111  1  1112  1              00012280
1113  1  1201  0  1202  0  1203  0  1204  0  1205  1              00012290
1301  0  1302  0  1303  0  1304  0  1305  0  1306  0              00012300
1307  0  1308  0  1401  0  1402  0  1403  0  1404  0              00012310
1405  1  1406  0  1407  1  1408  1  1409  0  1410  0              00012320
1411  1  1501  0  1502  0  1503  0  1504  0  1505  1              00012330
1506  1  1507  1  1508  1  1509  1  1510  1  1511  0              00012340
1512  1  1513  0  1514  0  1515  1  1516  0  1517  0              00012350
```

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1518  0     1519  1     1520  0     1521  0     1522  0     1523  0     00012360
1524  0     1525  0     1526  1     1601  1     1602  1     1603  0     00012370
1604  0     1605  1     1606  1     1607  1     1608  1     1609  0     00012380
1610  1     1611  1     1612  0     1613  0     1614  0     1615  1     00012390
1701  0     1702  0     1703  0     1704  0     1705  0     1706  0     00012400
1707  0     1708  0     1709  0     1710  0     1711  0     1712  0     00012410
1713  0     1714  1     1801  0     1802  0     1803  0     1804  0     00012420
1805  0     1806  0     1807  1     1901  0     1902  0     1903  0     00012430
1904  1     1905  0     1906  1     1907  0     1908  1     1909  1     00012440
1910  1     1911  1     1912  0     1913  0     1914  1     1915  1     00012450
2001  0     2002  0     2003  0     2004  0     2005  0     2006  0     00012460
2007  0     2008  0                                                     00012470
 45    FUNCTION    FN46,L296    SUPPLY DELAY                           00012480
0101  0     0102  0     0103  0     0104  0     0105  0     0106  0     00012490
0107  0     0108  0     0109  0     0110  0     0111  0     0112  0     00012500
0113  0     0114  0     0115  0     0116  0     0117  0     0118  0     00012510
0119  0     0120  1367  0201  0     0202  0     0203  0     0204  0     00012520
0205  0     0206  0     0207  0     0208  0     0209  0     0210  0     00012530
0211  0     0212  2880  0213  0     0214  3445  0215  0     0216  0     00012540
0217  3771  0218  0     0219  1727  0220  0     0221  0     0222  0     00012550
0223  0     0224  2640  0301  0     0302  0     0303  960   0304  0     00012560
0305  0     0306  4080  0307  0     0308  0     0309  0     0310  0     00012570
0311  0     0312  0     0313  960   0401  4350  0402  0     0403  0     00012580
0404  3957  0405  0     0406  0     0407  3957  0408  0     0409  1787  00012590
0410  840   0411  1767  0412  0     0413  0     0414  0     0415  2400  00012600
0416  0     0417  5040  0418  1200  0419  2640  0420  2640  0421  2640  00012610
0422  2640  0423  2640  0424  2640  0425  0     0426  0     0427  1787  00012620
0428  2160  0429  2160  0430  2160  0431  2160  0432  1787  0501  1440  00012630
0502  720   0503  373   0504  0     0505  0     0506  0     0507  0     00012640
0508  720   0601  0     0602  880   0603  0     0604  0     0605  0     00012650
0606  0     0607  0     0608  0     0609  0     0610  0     0611  1440  00012660
0612  1440  0613  0     0614  2417  0615  0     0616  0     0617  1440  00012670
0618  1197  0619  0     0620  0     0621  1440  0622  1440  0623  1440  00012680
0701  0     0702  4980  0703  0     0704  0     0705  0     0706  0     00012690
0707  0     0708  960   0709  3503  0710  3360  0711  0     0712  4900  00012700
0713  9920  0714  0     0715  0     0716  20    0717  0     0718  0     00012710
0719  0     0720  0     0721  0     0722  2107  0801  0     0802  1920  00012720
0803  0     0804  1680  0805  1200  0901  0     0902  0     0903  0     00012730
0904  0     0905  3017  0906  480   0907  963   0908  4560  0909  0     00012740
0910  0     0911  3017  0912  0     0913  0     0914  0     0915  0     00012750
0916  3017  1001  0     1002  0     1003  0     1004  0     1005  7440  00012760
1006  0     1007  0     1008  0     1009  0     1010  0     1011  2320  00012770
1101  5966  1102  0     1103  3745  1104  1800  1105  0     1106  240   00012780
1107  1800  1108  1800  1109  0     1110  0     1111  0     1112  2240  00012790
1113  1800  1201  0     1202  773   1203  0     1204  0     1205  1520  00012800
1301  2360  1302  0     1303  0     1304  0     1305  3840  1306  2360  00012810
1307  1800  1308  2360  1401  2160  1402  0     1403  0     1404  2880  00012820
1405  0     1406  0     1407  2160  1408  1280  1409  2160  1410  0     00012830
1411  2160  1501  2742  1502  0     1503  0     1504  0     1505  2742  00012840
1506  0     1507  1080  1508  2742  1509  0     1510  0     1511  0     00012850
1512  1440  1513  0     1514  0     1515  0     1516  0     1517  0     00012860
1518  2040  1519  3594  1520  10    1521  0     1522  0     1523  0     00012870
1524  1320  1525  960   1526  2742  1601  1825  1602  2640  1603  0     00012880
1604  1825  1605  1762  1606  0     1607  0     1608  0     1609  1825  00012890
1610  1080  1611  0     1612  1257  1613  0     1614  0     1615  7440  00012900
1701  0     1702  0     1703  0     1704  0     1705  0     1706  0     00012910
1707  0     1708  0     1709  0     1710  0     1711  0     1712  0     00012920
1713  0     1714  0     1801  0     1802  0     1803  0     1804  0     00012930
1805  0     1806  0     1807  0     1901  0     1902  1637  1903  1626  00012940
1904  6600  1905  1970  1906  1626  1907  1320  1908  4410  1909  4410  00012950
1910  1980  1911  1980  1912  0     1913  0     1914  6540  1915  1626  00012960
2001  10320 2002  480   2003  0     2004  1680  2005  0     2006  0     00012970
2007  6720  2008  4160                                                  00012980
 46    FUNCTION    P22,D296     ELEMENTS TABLE CODE                    00012990
0101  1     0102  2     0103  3     0104  4     0105  5     0106  6     00013000
0107  7     0108  8     0109  9     0110  10    0111  11    0112  12    00013010
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0113  13    0114  14    0115  15    0116  16    0117  17    0118  18    00013020
0119  19    0120  20    0201  21    0202  22    0203  23    0204  24    00013030
0205  25    0206  26    0207  27    0208  28    0209  29    0210  30    00013040
0211  31    0212  32    0213  33    0214  34    0215  35    0216  36    00013050
0217  37    0218  38    0219  39    0220  40    0221  41    0222  42    00013060
0223  43    0224  44    0301  45    0302  46    0303  47    0304  48    00013070
0305  49    0306  50    0307  51    0308  52    0309  53    0310  54    00013080
0311  55    0312  56    0313  57    0401  58    0402  59    0403  60    00013090
0404  61    0405  62    0406  63    0407  64    0408  65    0409  66    00013100
0410  67    0411  68    0412  69    0413  70    0414  71    0415  72    00013110
0416  73    0417  74    0418  75    0419  76    0420  77    0421  78    00013120
0422  79    0423  80    0424  81    0425  82    0426  83    0427  84    00013130
0428  85    0429  86    0430  87    0431  88    0432  89    0501  90    00013140
0502  91    0503  92    0504  93    0505  94    0506  95    0507  96    00013150
0508  97    0601  98    0602  99    0603  100   0604  101   0605  102   00013160
0606  103   0607  104   0608  105   0609  106   0610  107   0611  108   00013170
0612  109   0613  110   0614  111   0615  112   0616  113   0617  114   00013180
0618  115   0619  116   0620  117   0621  118   0622  119   0623  120   00013190
0701  121   0702  122   0703  123   0704  124   0705  125   0706  126   00013200
0707  127   0708  128   0709  129   0710  130   0711  131   0712  132   00013210
0713  133   0714  134   0715  135   0716  136   0717  137   0718  138   00013220
0719  139   0720  140   0721  141   0722  142   0801  143   0802  144   00013230
0803  145   0804  146   0805  147   0901  148   0902  149   0903  150   00013240
0904  151   0905  152   0906  153   0907  154   0908  155   0909  156   00013250
0910  157   0911  158   0912  159   0913  160   0914  161   0915  162   00013260
0916  163   1001  164   1002  165   1003  166   1004  167   1005  168   00013270
1006  169   1007  170   1008  171   1009  172   1010  173   1011  174   00013280
1101  175   1102  176   1103  177   1104  178   1105  179   1106  180   00013290
1107  181   1108  182   1109  183   1110  184   1111  185   1112  186   00013300
1113  187   1201  188   1202  189   1203  190   1204  191   1205  192   00013310
1301  193   1302  194   1303  195   1304  196   1305  197   1306  198   00013320
1307  199   1308  200   1401  201   1402  202   1403  203   1404  204   00013330
1405  205   1406  206   1407  207   1408  208   1409  209   1410  210   00013340
1411  211   1501  212   1502  213   1503  214   1504  215   1505  216   00013350
1506  217   1507  218   1508  219   1509  220   1510  221   1511  222   00013360
1512  223   1513  224   1514  225   1515  226   1516  227   1517  228   00013370
1518  229   1519  230   1520  231   1521  232   1522  233   1523  234   00013380
1524  235   1525  236   1526  237   1601  238   1602  239   1603  240   00013390
1604  241   1605  242   1606  243   1607  244   1608  245   1609  246   00013400
1610  247   1611  248   1612  249   1613  250   1614  251   1615  252   00013410
1701  253   1702  254   1703  255   1704  256   1705  257   1706  258   00013420
1707  259   1708  260   1709  261   1710  262   1711  263   1712  264   00013430
1713  265   1714  266   1801  267   1802  268   1803  269   1804  270   00013440
1805  271   1806  272   1807  273   1901  274   1902  275   1903  276   00013450
1904  277   1905  278   1906  279   1907  280   1908  281   1909  282   00013460
1910  283   1911  284   1912  285   1913  286   1914  287   1915  288   00013470
2001  289   2002  290   2003  291   2004  292   2005  293   2006  294   00013480
2007  295   2008  296                                                     00013490
*                                                                         00013500
*                                                                         00013510
 47    FUNCTION   P22,02   PERCENT NRTS (1-8), PERCENT NRTS (1-9)         00013520
101   0     2006  0                                                       00013530
*                                                                         00013540
*                                                                         00013550
 48    FUNCTION   FN46,L296   PROB OF NU CANNIBALIZATION GIVEN NORS       00013560
0101  999   0102  999   0103  999   0104  999   0105  999   0106  999   00013570
0107  999   0108  999   0109  999   0110  999   0111  999   0112  999   00013580
0113  999   0114  999   0115  999   0116  999   0117  999   0118  999   00013590
0119  999   0120  667   0201  999   0202  999   0203  999   0204  999   00013600
0205  999   0206  999   0207  999   0208  999   0209  999   0210  999   00013610
0211  999   0212  000   0213  999   0214  250   0215  999   0216  999   00013620
0217  571   0218  999   0219  999   0220  999   0221  999   0222  999   00013630
0223  999   0224  667   0301  999   0302  999   0303  000   0304  999   00013640
0305  999   0306  667   0307  999   0308  999   0309  999   0310  999   00013650
0311  999   0312  999   0313  667   0401  999   0402  999   0403  999   00013660
0404  333   0405  999   0406  999   0407  429   0408  999   0409  000   00013670
```

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0410  000   0411  999   0412  999   0413  999   0414  999   0415  999   00013680
0416  999   0417  999   0418  000   0419  500   0420  500   0421  500   00013690
0422  500   0423  500   0424  500   0425  999   0426  999   0427  000   00013700
0428  000   0429  000   0430  000   0431  000   0432  722   0501  000   00013710
0502  000   0503  000   0504  999   0505  999   0506  999   0507  999   00013720
0508  999   0601  999   0602  999   0603  999   0604  999   0605  999   00013730
0606  999   0607  999   0608  999   0609  999   0610  999   0611  000   00013740
0612  000   0613  999   0614  273   0615  999   0616  999   0617  000   00013750
0618  636   0619  999   0620  999   0621  000   0622  000   0623  000   00013760
0701  999   0702  000   0703  999   0704  999   0705  999   0706  999   00013770
0707  999   0708  999   0709  667   0710  999   0711  999   0712  100   00013780
0713  000   0714  999   0715  999   0716  000   0717  999   0718  999   00013790
0719  999   0720  999   0721  999   0722  611   0801  999   0802  500   00013800
0803  999   0804  000   0805  999   0901  999   0902  999   0903  999   00013810
0904  999   0905  000   0906  000   0907  000   0908  000   0909  999   00013820
0910  999   0911  000   0912  999   0913  999   0914  999   0915  999   00013830
0916  000   1001  999   1002  999   1003  999   1004  999   1005  000   00013840
1006  999   1007  999   1008  999   1009  999   1010  999   1011  667   00013850
1101  438   1102  999   1103  000   1104  000   1105  999   1106  000   00013860
1107  000   1108  000   1109  999   1110  999   1111  999   1112  000   00013870
1113  000   1201  999   1202  667   1203  999   1204  999   1205  000   00013880
1301  000   1302  999   1303  999   1304  999   1305  000   1306  000   00013890
1307  999   1308  000   1401  000   1402  999   1403  999   1404  000   00013900
1405  999   1406  999   1407  000   1408  000   1409  000   1410  999   00013910
1411  467   1501  000   1502  999   1503  999   1504  999   1505  000   00013920
1506  999   1507  500   1508  000   1509  999   1510  999   1511  999   00013930
1512  000   1513  999   1514  999   1515  999   1516  999   1517  999   00013940
1518  999   1519  071   1520  000   1521  999   1522  999   1523  999   00013950
1524  000   1525  500   1526  000   1601  000   1602  000   1603  999   00013960
1604  000   1605  444   1606  999   1607  999   1608  999   1609  000   00013970
1610  999   1611  999   1612  500   1613  999   1614  999   1615  000   00013980
1701  999   1702  999   1703  999   1704  000   1705  999   1706  999   00013990
1707  999   1708  999   1709  000   1710  999   1711  999   1712  999   00014000
1713  999   1714  000   1801  000   1802  000   1803  999   1804  999   00014010
1805  999   1806  999   1807  000   1901  999   1902  571   1903  000   00014020
1904  750   1905  777   1906  000   1907  999   1908  667   1909  667   00014030
1910  000   1911  000   1912  999   1913  999   1914  667   1915  000   00014040
2001  000   2002  000   2003  999   2004  000   2005  999   2006  999   00014050
2007  000   2008  667                                                   00014060
 49    FUNCTION   P22,D2      DS AND GS SHOPS (DUMMY)                   00014070
101   55    2902   55                                                   00014080
*                                                                       00014090
*                                                                       00014100
 51    FUNCTION   RN1,D2      PROB MULTI FAIL BAD PART FROM SUPPLY       00014110
.1    1     .9     1                                                   00014120
*                                                                       00014130
*                                                                       00014140
 52    FUNCTION   P22,D2   PCT ITG DS-O RPR/REM-RPL, PCT DS RPR/RC*D     00014150
101   0     2008   0                                                   00014160
 53    FUNCTION   FN46,L296   MEMT ON EQUIPMENT REPAIR                 00014170
0101 0000000102 0000000103 0000000104 0110000105 0930000106 05300000014180
0107 0450000108 0000000109 0000000110 0000000111 0160000112 09500000014190
0113 0000000114 0000000115 0800000116 0800000117 0050000118 02100000014200
0119 0000000120 0270000201 0000000202 0000000203 0100000204 00000000014210
0205 0000000206 0000000207 0000000208 0000000209 0000000210 00000000014220
0211 0000000212 0130000213 0000000214 0060000215 0230000216 02800000014230
0217 0150000218 0000000219 0000000220 0000000221 0000000222 00000000014240
0223 0000000224 0080000301 0000000302 0000000303 0000000304 01300000014250
0305 0000000306 0000000307 0000000308 0000000309 0000000310 00000000014260
0311 0000000312 0000000313 0530000401 0710000402 0200000403 02400000014270
0404 0730000405 0310000406 0000000407 0150000408 0270000409 01800000014280
0410 0080000411 0170000412 0070000413 0000000414 0210000415 00000000014290
0416 0000000417 0000000418 0000000419 0200000420 0200000421 02000000014300
0422 0200000423 0200000424 0200000425 0000000426 0000000427 00000000014310
0428 0190000429 0190000430 0190000431 0190000432 0230000501 00000000014320
0502 0120000503 0000000504 0000000505 0000000506 0000000507 00400000014330
```

```
0506 0160000601 0060000602 0040000603 0000000604 0260000605 083000000014340
0606 0000000607 0050000608 0900000609 0350000610 0000000611 000000000014350
0612 0030000613 0000000614 0100000615 0000000616 0000000617 000000000014360
0618 0100000619 0000000620 0000000621 0140000622 0070000623 017000000014370
0701 0000000702 0000000703 0100000704 0030000705 0000000706 014000000014380
0707 0520000708 0000000709 0130000710 0000000711 0200000712 009000000014390
0713 0000000714 0000000715 0080000716 0000000717 0000000718 000000000014400
0719 0020000720 0030000721 0000000722 0110000801 0000000802 000000000014410
0803 0200000804 0020000805 0030000901 0060000902 0020000903 000000000014420
0904 0000000905 0000000906 0000000907 0000000908 0000000909 000000000014430
0910 0000000911 0000000912 0000000913 0000000914 0000000915 000000000014440
0916 0140001001 0900001002 0000001003 0100001004 0070001005 028000000014450
1006 0730001007 0130001008 0000001009 0000001010 0150001011 040000000014460
1101 0100001102 0140001103 0140001104 0400001105 0000001106 010000000014470
1107 0000001108 0000001109 0000001110 0000001111 0060001112 008000000014480
1113 0070001201 0130001202 0000001203 0000001204 0090001205 024000000014490
1301 0000001302 0000001303 0000001304 0150001305 0000001306 005000000014500
1307 0100001306 0100001401 0000001402 0000001403 0000001404 010000000014510
1405 0000001406 0000001407 0000001408 0000001409 0000001410 000000000014520
1411 0130001501 0040001502 0200001503 0150001504 0070001505 005000000014530
1506 0000001507 0000001508 0150001509 0000001510 0300001511 003000000014540
1512 0000001513 0050001514 0000001515 0000001516 0000001517 011000000014550
1518 0100001519 0150001520 0086001521 0000001522 0060001523 002000000014560
1524 0080001525 0030001526 0110001601 0040001602 0050001603 000000000014570
1604 0120001605 0090001606 0130001607 0110001608 0150001609 000000000014580
1610 0100001611 0000001612 0000001613 0600001614 0000001615 021000000014590
1701 0150001702 0000001703 0000001704 0050001705 0000001706 003000000014600
1707 0040001708 0000001709 0040001710 0000001711 0060001712 015000000014610
1713 0000001714 0080001801 0150001802 0000001803 0050001804 000000000014620
1805 0200001806 0000001807 0050001901 0000001902 0000001903 011000000014630
1904 0000001905 0000001906 0040001907 0080001908 0050001909 005000000014640
1910 0310001911 0310001912 0120001913 0120001914 0000001915 045000000014650
2001 0060002002 0000002[illegible] 0100002004 0070002005 0150002006 012000000014660
2007 0180002008 011000 00014670
```

```
54  FUNCTION  FN46,L29[illegible]  MPR ON-EQUIP RPR 2NDARY WC, PRIMARY WC  00014680
0101 0000000102 0000000103 0000000104 0000100105 0007100106 000910000014690
0107 0006100108 0000000109 0000000110 0000000111 0000100112 000111000014700
0113 0000000114 0000000115 0010100116 0010100117 0000100118 000010000014710
0119 0000000120 0010040201 0000000202 0000000203 0000100204 000000000014720
0205 0000000206 0000000207 0000000208 0000000209 0000000210 000000000014730
0211 0000000212 0000100213 0000000214 0000100215 0000100216 002002000014740
0217 0000200218 0000000219 0000000220 0000000221 0000000222 000000000014750
0223 0000000224 0000120301 0000000302 0000000303 0000000304 000010000014760
0305 0000000306 0000000307 0000000308 0000000309 0000000310 000000000014770
0311 0000000312 0000000313 0001130401 0009190402 0000200403 000513000014780
0404 0001140405 0003150406 0000000407 0001100408 0001170409 000010000014790
0410 0004140411 0009100412 0000200413 0000000414 0001100415 000000000014800
0416 0000000417 0000000418 0000000419 0000100420 0000100421 000010000014810
0422 0000100423 0000100424 0000100425 0000000426 0000000427 000000000014820
0428 0004000429 0004060430 0004060431 0004060432 0002140501 000000000014830
0502 0000200503 0000000504 0000000505 0000000506 0000000507 000004000014840
0508 0002130601 0000000602 0000100603 0000000604 0001160605 000812000014850
0606 0000000607 0000100608 0000200609 0003070610 0000000611 000000000014860
0612 0000100613 0000000614 0002210615 0000000616 0000000617 000000000014870
0618 0003090619 0000000620 0000000621 0001090622 0000190623 000213000014880
0701 0000000702 0000000703 0000100704 0000100705 0000000706 000610000014890
0707 0006120708 0000000709 0002110710 0000000711 0000100712 000608000014900
0713 0000000714 0000000715 0300100716 0000000717 0000000718 000000000014910
0719 0000100720 0000100721 0000000722 0005080801 0000000802 000000000014920
0803 0000100804 0000100805 0000100901 0002080902 0000100903 000000000014930
0904 0000000905 0000000906 0000000907 0000000908 0000000909 000000000014940
0910 0000000911 0000000912 0000000913 0000000914 0000000915 000000000014950
0916 0001111001 0004061002 0000001003 0005101004 0000101005 000208000014960
1006 0001091007 0018081008 0000001009 0000001010 0000101011 000308000014970
1101 0001091102 0004071103 0000191104 0000201105 0000001106 000307000014980
1107 0000001108 0000001109 0000001110 0000001111 0000201112 000010000014990
```

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1113  0004091201  0008031202  0000001203  0000001204  0000101205  00010900015000
1301  0000001302  0000001303  0000001304  0000101305  0000001306  00001000015010
1307  0000101308  0008031401  0000001402  0000001403  0000001404  00002000015020
1405  0000001406  0000001407  0000001408  0000001409  0000001410  00000000015030
1411  0002101501  0000301502  0000101503  0000101504  0000101505  00001000015040
1506  0000001507  0000001508  0000101509  0000001510  0000161511  00001000015050
1512  0000001513  0005151514  0000001515  0000001516  0000001517  00001000015060
1518  0000101519  0003131520  0005051521  0000001522  0000101523  00001000015070
1524  0004081525  0000101526  0008031601  0000101602  0000101603  00000000015080
1604  0000111605  0000181606  0000101607  0000101608  0000101609  00000000015090
1610  0000101611  0000001612  0000001613  0000101614  0000001615  00001200015100
1701  0007031702  0000001703  0000001704  0000101705  0000001706  00001000015110
1707  0000101708  0000001709  0000101710  0000001711  0006041712  00001000015120
1713  0000001714  0000101801  0000101802  0000001803  0000101804  00000000015130
1805  0000101806  0000001807  0000101901  0000001902  0000001903  00001000015140
1904  0000001905  0000001906  0003071907  0004191908  0015051909  00150500015150
1910  0010031911  0010031912  0003191913  0002091914  0000001915  00050800015160
2001  0000102002  0000002003  0000102004  0003142005  0000202006  00020800015170
2007  0000172008  000509                                          00015180
 55    FUNCTION   P1,E3                                          00015190
1      V136  2    V137  3    V52                                  00015200
*                                                                 00015210
 56    FUNCTION   RN1,D6      PROB MULT MA/MA PMI                  00015220
0.67891      0.92692      0.98713      0.99824      0.99985      0.99996  00015230
*                                                                 00015240
*                                                                 00015250
 57    FUNCTION   RN1,D19     PROB SYSTEM MA PMI/MA PMI            00015260
0.064501     0.164002     0.281203     0.441304     0.543806     0.594507 00015270
0.597008     0.651709     0.652710     0.671911     0.725112     0.727113 00015280
0.740414     0.792115     0.805916     0.815317     0.817818     0.974919 00015290
0.999920                                                          00015300
*                                                                 00015310
*                                                                 00015320
 58    FUNCTION   FN46,L296   PROB ELEMENT MA  P M I   /SYS MA  P M I  00015330
0101  000  0102  000  0103  000  0104  000  0105  000  0106  000  00015340
0107  076  0108  000  0109  091  0110  091  0111  000  0112  038  00015350
0113  015  0114  015  0115  015  0116  000  0117  000  0118  000  00015360
0119  036  0120  618  0201  000  0202  000  0203  050  0204  040  00015370
0205  099  0206  000  0207  000  0208  050  0209  000  0210  000  00015380
0211  079  0212  000  0213  000  0214  000  0215  000  0216  000  00015390
0217  000  0218  000  0219  074  0220  074  0221  149  0222  099  00015400
0223  050  0224  238  0301  042  0302  000  0303  000  0304  000  00015410
0305  021  0306  000  0307  021  0308  000  0309  042  0310  042  00015420
0311  084  0312  033  0313  714  0401  138  0402  000  0403  000  00015430
0404  000  0405  000  0406  000  0407  000  0408  043  0409  031  00015440
0410  142  0411  000  0412  000  0413  000  0414  000  0415  092  00015450
0416  000  0417  000  0418  000  0419  021  0420  021  0421  021  00015460
0422  021  0423  021  0424  021  0425  000  0426  000  0427  000  00015470
0428  017  0429  017  0430  017  0431  017  0432  363  0501  000  00015480
0502  000  0503  000  0504  000  0505  000  0506  000  0507  000  00015490
0508  000  0601  106  0602  000  0603  000  0604  096  0605  000  00015500
0606  000  0607  000  0608  000  0609  000  0610  000  0611  000  00015510
0612  063  0613  000  0614  000  0615  000  0616  010  0617  000  00015520
0618  000  0619  000  0620  063  0621  106  0622  063  0623  495  00015530
0701  000  0702  000  0703  000  0704  097  0705  000  0706  330  00015540
0707  019  0708  000  0709  000  0710  000  0711  000  0712  437  00015550
0713  000  0714  078  0715  000  0716  000  0717  019  0718  000  00015560
0719  000  0720  019  0721  000  0722  000  0801  999  0802  000  00015570
0803  000  0804  000  0805  000  0901  000  0902  000  0903  000  00015580
0904  018  0905  000  0906  000  0907  000  0908  000  0909  000  00015590
0910  144  0911  523  0912  000  0913  000  0914  000  0915  027  00015600
0916  288  1001  000  1002  000  1003  000  1004  000  1005  000  00015610
1006  000  1007  999  1008  000  1009  000  1010  000  1011  000  00015620
1101  000  1102  000  1103  000  1104  000  1105  000  1106  000  00015630
1107  000  1108  256  1109  000  1110  000  1111  000  1112  000  00015640
1113  744  1201  555  1202  185  1203  213  1204  046  1205  000  00015650
```

1301	000	1302	000	1303	000	1304	000	1305	500	1306	000	00015660
1307	500	1308	000	1401	185	1402	000	1403	000	1404	000	00015670
1405	185	1406	444	1407	000	1408	000	1409	185	1410	000	00015680
1411	000	1501	000	1502	000	1503	019	1504	095	1505	000	00015690
1506	000	1507	000	1508	000	1509	000	1510	095	1511	000	00015700
1512	000	1513	000	1514	000	1515	048	1516	095	1517	000	00015710
1518	019	1519	000	1520	000	1521	019	1522	048	1523	000	00015720
1524	000	1525	000	1526	562	1601	000	1602	536	1603	000	00015730
1604	179	1605	000	1606	071	1607	000	1608	000	1609	071	00015740
1610	071	1611	000	1612	000	1613	071	1614	000	1615	000	00015750
1701	000	1702	000	1703	000	1704	000	1705	000	1706	000	00015760
1707	000	1708	000	1709	000	1710	105	1711	105	1712	000	00015770
1713	000	1714	789	1801	000	1802	000	1803	000	1804	999	00015780
1805	000	1806	000	1807	000	1901	107	1902	197	1903	000	00015790
1904	323	1905	000	1906	000	1907	031	1908	000	1909	000	00015800
1910	024	1911	024	1912	000	1913	000	1914	000	1915	295	00015810
2001	588	2002	137	2003	000	2004	000	2005	000	2006	039	00015820
2007	235	2008	000									00015830
70	FUNCTION		FN46,L296		SKILL CODE		-WORK CENTER-		REMOVE & REPLACE			00015840
0101	0000030102		0002030103		0007030104		0007030105		0000000106			00000000015850
0107	0000000108		0000070109		0007030110		0007030111		0000000112			00000000015860
0113	0000030114		0000030115		0000000116		0000000117		0007050118			00000000015870
0119	0000030120		0007030201		0000030202		0003020203		0000000204			00000300015880
0205	0003020206		0000030207		0002030208		0002030209		0000030210			00010300015890
0211	0005030212		0002030213		0000050214		0005030215		0002050216			00020300015900
0217	0000030218		0000030219		0002030220		0000030221		0000030222			00000300015910
0223	0010030224		0002030301		0000030302		0000040303		0000030304			00000300015920
0305	0000030306		0000030307		0000030308		0000030309		0000030310			00030200015930
0311	0002030312		0000030313		0010030401		0001030402		0000000403			00000000015940
0404	0001030405		0000030406		0000030407		0001030408		0000000409			00000300015950
0410	0006030411		0006030412		0000030413		0001030414		0000030415			00000300015960
0416	0000030417		0000030418		0000030419		0002030420		0002030421			00020300015970
0422	0002030423		0002030424		0002030425		0007030426		0005030427			00020300015980
0428	0007030429		0007030430		0007030431		0007030432		0002030501			00020300015990
0502	0000030503		0002030504		0000030505		0000020506		0002030507			00020300016000
0508	0005030601		0006030602		0006030603		0002030604		0009030605			00000300016010
0606	0000030607		0000030608		0001030609		0000030610		0000030611			00000300016020
0612	0000030613		0000030614		0009030615		0000030616		0000030617			00000300016030
0618	0008030619		0002080620		0002030621		0007030622		0006030623			00060300016040
0701	0009030702		0009030703		0000030704		0009030705		0002030706			00020300016050
0707	0000000708		0003090709		0009030710		0003090711		0009030712			00030900016060
0713	0005030714		0005030715		0000020716		0000030717		0000030718			00000300016070
0719	0000030720		0000030721		0000030722		0003090801		0008020802			00080300016080
0803	0002030804		0009030805		0007030901		0002080902		0000080903			00000800016090
0904	0000030905		0003080906		0008030907		0000080908		0003080909			00030800016100
0910	0002030911		0003080912		0003080913		0003080914		0000020915			00000800016110
0916	0008031001		0000001002		0001031003		0000031004		0000001005			00010300016120
1006	0000001007		0003041006		0006031009		0000031010		0000001011			00010300016130
1101	0005031102		0000001103		0005031104		0002031105		0005031106			00080300016140
1107	0005081108		0002081109		0006031110		0000031111		0000031112			00000300016150
1113	0005031201		0002031202		0000031203		0003081204		0001031205			00020300016160
1301	0002031302		0000031303		0000031304		0000031305		0000081306			00080400016170
1307	0008041308		0007081401		0000031402		0003081403		0001031404			00080300016180
1405	0000031406		0000031407		0000031408		0000031409		0008031410			00000300016190
1411	0002031501		0008031502		0000081503		0009031504		0002031505			00000400016200
1506	0000041507		0000041508		0000081509		0000081510		0003081511			00080400016210
1512	0001041513		0004031514		0000081515		0000081516		0000071517			00030800016220
1518	0008031519		0009081520		0008031521		0003021522		0001031523			00080300016230
1524	0003081525		0004081526		0003081601		0000041602		0001041603			00020400016240
1604	0000041605		0000041606		0000001607		0000041608		0000041609			00000400016250
1610	0003081611		0000041612		0000041613		0000041614		0000041615			00010400016260
1701	0008031702		0000041703		0001041704		0000041705		0000041706			00000000016270
1707	0003041708		0000041709		0008041710		0008041711		0000011712			00000400016280
1713	0000041714		0008041801		0000041802		0000041803		0008041804			00000400016290
1805	0003041806		0000041807		0000041901		0000031902		0009031903			00090300016300
1904	0003091905		0003081906		0008031907		0001091908		0003091909			00030900016310

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1910  0003091911  0003091912  0000001913  0009031914  0009031915  0003090016320
2001  0009032002  0009032003  0008032004  0000032005  0000032006  0009020016330
2007  0007092008  000309                                                00016340
 71    FUNCTION    P1,E3       VARIABLE SORT FOR WORK CENTERS, R&R      00016350
1      V270  2     V269  3     V268                                     00016360
       INITIAL     XH78,1566                                          00016370
       INITIAL     MH11(1-4,5),1      MON  ROW=LAUNCH,DATA=PRIORITY   00016380
       INITIAL     MH13(1-5,5),1      ROW=LAUNCH,DATA=PRIORITY        00016400
       INITIAL     MH14(1-4,5),1      THU  ROW=LAUNCH,DATA=PRIORITY   00016410
       INITIAL     MH15(1-4,5),1      FRI  ROW=LAUNCH,DATA=PRIORITY   00016420
       INITIAL     MH11(1,10),1       MON  NO. OF A/C LAUNCH1         00016430
       INITIAL     MH13(1,10),1       WED  NO. OF A/C LAUNCH1         00016450
       INITIAL     MH14(1,10),1       THU  NO. OF A/C LAUNCH1         00016460
       INITIAL     MH15(1,10),1       FRI  NO. OF A/C LAUNCH1         00016470
       INITIAL     MH11(2,10),1       MON  NO. OF A/C LAUNCH2         00016480
       INITIAL     MH13(2,10),1       WED  NO. OF A/C LAUNCH2         00016500
       INITIAL     MH14(2,10),1       THU  NO. OF A/C LAUNCH2         00016510
       INITIAL     MH15(2,10),1       FRI  NO. OF A/C LAUNCH2         00016520
       INITIAL     MH11(3,10),2       MON  NO. OF A/C LAUNCH3         00016530
       INITIAL     MH13(3,10),1       WED  NO. OF A/C LAUNCH3         00016550
       INITIAL     MH14(3,10),2       THU  NO. OF A/C LUANCH3         00016560
       INITIAL     MH15(3,10),1       FRI  NO. OF A/C LAUNCH3         00016570
       INITIAL     MH11(4,10),1       MON  NO. OF A/C LAUNCH4         00016580
       INITIAL     MH13(4,10),2       WED  NO. OF A/C LAUNCH4         00016600
       INITIAL     MH14(4,10),1       THU  NO. OF A/C LAUNCH4         00016610
       INITIAL     MH15(4,10),1       FRI  NO. OF A/C LAUNCH4         00016620
       INITIAL     MH13(5,10),1       WED  NO. OF A/C LAUNCH5         00016625
       INITIAL     MH11(1,11),88      MON  TIME FROM 00:12 TO 1ST LAUNCH 00016630
       INITIAL     MH13(1,11),88      WED  TIME FROM 00:12 TO 1ST LAUNCH 00016650
       INITIAL     MH14(1,11),88      THU  TIME FROM 00:12 TO 1ST LAUNCH 00016660
       INITIAL     MH15(1,11),88      FRI  TIME FROM 00:12 TO 1ST LAUNCH 00016670
       INITIAL     MH11(2,11),5       MON  TIME BETWEEN LAUNCH 1&2    00016680
       INITIAL     MH13(2,11),1       WED TIME BETWEEN LAUNCH 1&2     00016700
       INITIAL     MH14(2,11),5       THU  TIME BETWEEN LAUNCH 1&2    00016710
       INITIAL     MH15(2,11),5       FRI  TIME BETWEEN LAUNCH 1&2    00016720
       INITIAL     MH11(3,11),20      MON  TIME BETWEEN LAUNCH 2&3    00016730
       INITIAL     MH13(3,11),4       WED TIME BETWEEN LAUNCH 2&3     00016750
       INITIAL     MH14(3,11),20      THU  TIME BETWEEN LAUNCH 2&3    00016760
       INITIAL     MH15(3,11),20      FRI  TIME BETWEEN LAUNCH 2&3    00016770
       INITIAL     MH11(4,11),20      MON  TIME BETWEEN LAUNCH 3&4    00016780
       INITIAL     MH13(4,11),20      WED TIME BETWEEN LAUNCH 3&4     00016800
       INITIAL     MH14(4,11),20      THU  TIME BETWEEN LAUNCH 3&4    00016810
       INITIAL     MH15(4,11),20      FRI  TIME BETWEEN LAUNCH 3&4    00016820
       INITIAL     MH13(5,11),20      WED TIME BETWEEN LAUNCH 4&5     00016825
       INITIAL     MH11(2,12),107     MON  TIME BETWEEN LAUNCH 4&00:12 00016830
       INITIAL     MH13(2,12),107     WED  TIME BETWEEN LAUNCH 4&00:12 00016850
       INITIAL     MH14(2,12),107     THU  TIME BETWEEN LAUNCH 3&00:12 00016860
       INITIAL     MH15(2,12),107     FRI  TIME BETWEEN LAUNCH 4&00:12 00016870
       INITIAL     MH11(1,12),4       MON  NO. OF LAUNCHES PER DAY    00016880
       INITIAL     MH13(1,12),5       WED  NO. OF LAUNCHES            00016900
       INITIAL     MH14(1,12),4       THU  NO. OF LAUNCHES PER DAY    00016910
       INITIAL     MH15(1,12),4       FRI  NO. OF LAUNCHES PER DAY    00016920
       INITIAL     MH1(1,13),480     NON FLYING HOURS WEEKEND         00016930
       INITIAL     MH1(1,14),1200    FLYING HOURS WEEKDAYS            00016940
       INITIAL     MH1(3,12),5       SLACK TIME                       00016950
       INITIAL     MH1(8,12),14       TIME FROM CALL TO LAUNCH        00016960
       INITIAL     MH1(6,13),0       TIME TO PERFORM AIRCREW INSPECTION 00016970
       INITIAL     MH1(7,13),5       LAUNCH TIME TO REPLACE ABORTS    00016980
       INITIAL     MH1(1,17),999     PERCENT IN-FLT ABORTS REPLACED   00016990
       INITIAL     MH1(1,15),1       NO STANDBY A/C BY MISSION TYPE   00017000
       INITIAL     MH1(1,18),18       FLT DURATION FOR ABORT REPLACEMENTS00017010
       INITIAL     MH1(1,16),2       NO.PRELAUNCH EVENTS              00017020
       INITIAL     MH1(1,21),5       TIME LAUNCH WINDOW STAYS OPEN    00017030
       INITIAL     MH1(1,15),1       STANDBY AIRCRAFT MISSION 1       00017040
       INITIAL     MH1(2,16),2           PRELAUNCH EVENTS             00017050
       INITIAL     MH1(6,17),1200    5 DAY FLYING PERIOD              00017060
```

APPENDIX IV

CH-54B MODEL PROGRAM UPDATE AND PROGRAM LISTING WITH NECESSARY MODIFICATIONS TO THE GOVERNMENT-FURNISHED MODEL IDENTIFIED

PROGRAM UPDATE FOR THE CH-54B MODEL

The program update for the CH-54B model is contained in this Appendix. This update contains the reasons for all Sikorsky-initiated changes. Eustis Directorate initiated some changes to improve the overall model, and these changes are noted without comment. Certain specific changes made by Sikorsky are of particular significance and are elaborated on below.

Incorporation of Log Normal Distribution

The log normal distribution has been incorporated into the CH-54B baseline simulation model to replace the exponential distribution previously contained in the simulation model input function 36. The log normal (to the Base e) is more representative of the replacement and repair elapsed maintenance time distributions evidenced by the CH-54B. Contained in figure 7 are graphs comparing the two distributions followed by pertinent facts about the log normal distribution used for CH-54B simulation runs.

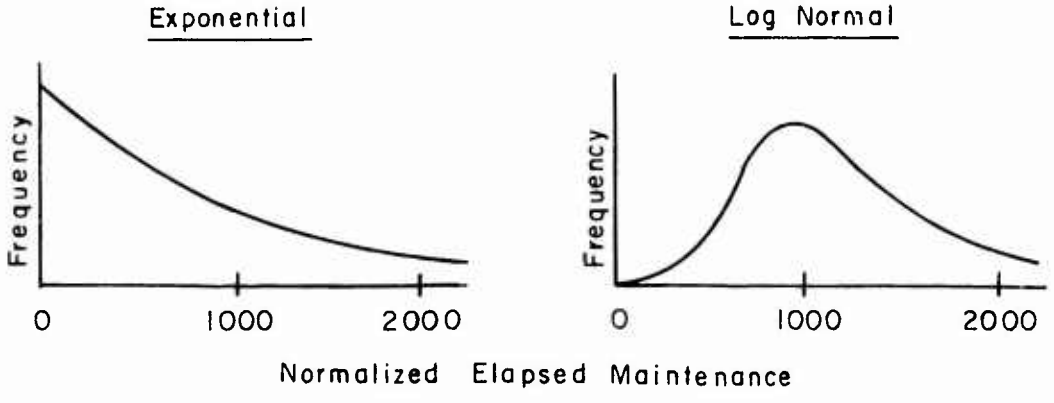


Figure 7. Alternative Elapsed Maintenance Time Distributions

The elapsed maintenance time distributions of eight different CH-54B components were studied to ascertain the most appropriate distribution for the CH-54B. The eight components were singled out because they contained the most data. The shape of the observed distributions dictated that the log normal be used instead of the exponential distribution. Therefore, the exponential distribution with mean = 1000 was replaced by the log normal distribution with mean = 1000. The log normal distribution, which was found to best represent the eight observed distributions, reflected the following log values:

θ = Mean of the natural log of the variable x = 6.784
σ^2 = Variance of the natural log of the variable x = .25

TBO Initialization

The CH-54B R&M model reflects that components reaching their TBO times are replaced with components having their full TBO time remaining. The simulation runs bear out the adequacy of present logic. Based on the TBO component scheduled removal times as defined under "CH-54B Aircraft Description", the removal rate for all scheduled TBO replacements should approximate 17 scheduled removals/1000 flight hours. The slightly higher value results from the interaction of the initialized component times and the first preventive maintenance periodic (PMP) inspection. Because of the 100 flight hour duration between PMP's, components having less than 100 hours remaining before TBO expiration are replaced. This results in a slightly higher rate of replacement. This, however, is consistent with procedures practiced in the field.

Modified Daily Inspection Schedule

The daily inspection subroutine has been modified to eliminate the possibility of daily inspections being performed on overtime hours. This was in compliance with an Army request. This modification resulted in a less flexible daily flight schedule, since all flying and daily inspections as well as preflights had to be packed into the 8-hour operational day.

CH-54B MODEL PROGRAM LISTING WITH NECESSARY MODIFICATION TO THE GOVERNMENT-FURNISHED MODEL IDENTIFIED

The following is a list of changes made to the Government-furnished model to convert the UH-1N R&M model to conform to CH-54B aircraft and operational characteristics. Changes made by the Government to update the original UH-1N R&M model are so noted with no further comment.

1. The change in the reallocation of functions, variables, full-word save-values, and transactions was necessary to reapportion the allocation of entities in the model to accommodate changes to simulate CH-54B operation.

2. Variable 9 has been corrected to allow general use of the variable as well as inclusion of a snap feature.

3. Variable 19 has been modified to be general with respect to the start of the first shift.

4. Variable 38 has been generalized with respect to the end of the first shift.

5. Per a Eustis Directorate correction, variable 73 is now correct.

6. Variable 233 has been added per Eustis Directorate directive.

7. Variable 238 has been added per Eustis Directorate directive.

8. Variables 268, 269, 270 have been added to provide different centers for remove and replace actions. These variables decode the "packed" information contained in function 70.

9. Variable 267 was added to accommodate the scheduling of launch calls on a daily basis. This variable will define the half matrix to be used for that particular day's launches.

10. Boolean variable 11 has been changed per Eustis Directorate.

11. Boolean variable 19 has been changed per Eustis Directorate.

12. Half matrices 11-17 have been added for the daily launch schedule. Half matrix 11 is Monday's launches and matrix 17 is Sunday's.

13. Table 9 has been changed to give a more meaningful output of downtime distribution for the CH-54B.

14. Table 18 has been added to tabulate the start of each daily inspection.

15. Table 19 has been added to tabulate the number of deferred maintenance actions caused by the aircraft at the start of the daily inspection.

16. Storages 33 through 42 have been limited to the levels defined by the CH-54B TOE.

17. The PMI has been added to function 7 (event code 8).

18. Function 15 has been modified to identify function 57 for the system failure for PMI.

19. Function 23 has been modified to identify function 58 for the element failure for PMI.

20. The log normal distribution has been substituted for the exponential distribution.

21. Function 40 has been redefined as the skill codes (or work centers) for on-aircraft repair only. It was formerly the skill codes for on-aircraft repair as well as remove and replace.

22. Function 48 has been redefined as the probability of no cannibalization given a NORS item.

23. Function 58 has been added to define the probability of element failure given system failure during PMI.

24. Function 70 has been added to define separate work centers for remove and replace actions.

25. Function 71 has been added to use variables 268, 269, and 270 to decode the data contained in function 70.

26. In order to define the daily flight schedule in half matrices 1 through 17, these initial statements have been added. The structure is defined such that the rows and columns contain the data in the same matrix location as half matrix 1 formerly contained. Data other than flight schedule data is still retained in half matrix 1.

27. These initial statements were added per Eustis Directorate.

28. This initial statement defines save-value 1601 as the time of the end of first shift. It is used in variable 38.

29. These model logic changes were added to define a flight schedule on a daily basis.

30. Changed per Eustis Directorate.

31. Number of TBO items to be initialized has been generalized.

32. Added per Eustis Directorate.

33. Added per Eustis Directorate.

34. Added per Eustis Directorate.

35. Added per Eustis Directorate.

36. Table 18 added to tabulate time daily performed.

37. Table 19 added to tabulate number of deferred maintenance actions carried at the start of the daily inspection.

38. Added per Eustis Directorate.

39. Added per Eustis Directorate.

40. Added per Eustis Directorate.

41. Added per Eustis Directorate.

42. Corrected per Eustis Directorate.

43. Added to insure that if the item is a remove and replace action 100% of the time, and if the random number comes up as 999, it still will be a remove and replace action.

44. Changed to be consistent with the definition of function 38 being probability of part availability.

45. Logic change to assign remove and replace work centers from function 70 and on-aircraft repair work centers from function 40.

46. Removed truncation of elapsed maintenance times. With the use of the log normal distribution of repair times in place of exponential, truncation of the distribution was not necessary.

47. Added per Eustis Directorate.

48. Removed the test to put test hops in the second shift. The CH-54B is a one-shift operation.

49. The CH-54B baseline requires a .650 value in this statement to get the proper percentage of test hop flight time.

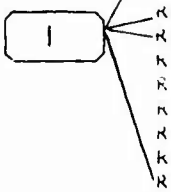
50. Changed per Eustis Directorate.

51. Added to require secondary work centers for cannibalization remove and replace actions when needed.

52. Untruncated cannibalization remove and replace time to correspond with CH-54B data.

53. Added per Eustis Directorate.

54. Report changed to more clearly output CH-54B simulated operational statistics.




```
                REALLOCATE BLD,1450                                              00000010
                REALLOCATE STO,90                                                00000020
                REALLOCATE QUE,70                                                00000030
                REALLOCATE LOG,40                                                00000040
                REALLOCATE FUN,60                                                00000050
                REALLOCATE TAB,20                                                00000060
                REALLOCATE DVR,20                                                00000070
                REALLOCATE VAR,270                                               00000080
                REALLOCATE FSV,1750                                              00000090
                REALLOCATE HSV,90                                                00000100
                REALLOCATE CHA,60                                                00000110
                REALLOCATE GRP,70                                                00000120
                REALLOCATE FMS,5                                                 00000130
                REALLOCATE HMS,20                                                00000140
                REALLOCATE XAC,400                                               00000150
                REALLOCATE COM,175000                                            00000160
                SIMULATE    GO                                                   00000170
                UNLIST      ABS                                                  00000180
1               VARIABLE    P2+K5  MISSION MATRIX COLUMN NUMBERS                 00000190
2               VARIABLE    P11+K5  MISSION MATRIX NUMBERS                       00000200
3               VARIABLE    P11+K8  "MISSION FLYING HOUR GOAL" SWITCH NUMBERS    00000210
4               VARIABLE    P11+K11  "MISSION FLYING HOURS" SAVEVALUE NUMBERS     00000220
5               VARIABLE    P4+K5 "AIRCRAFT NOT AVAILABLE WHEN CALLED" MISSION XH 00000230
6               VARIABLE    P4+K3 "MISSION LAUNCH GATE" SWITCH NUMBERS           00000240
7               VARIABLE    P11+K13 "MISSION CYCLIC FLYING HOUR" SWITCH NUMBERS  00000250
8               VARIABLE    P4+K13 "MISSION CYCLIC FLYING HOUR" SWITCH NUMBERS   00000260
9               VARIABLE    P3-C1       CORRECTED   11.5.74                      00000270
10              VARIABLE    (RN1*1000+RN1)@X195  INITIAL DAYS SINCE PMP          00000280
11              VARIABLE    (P47+(C1/240))@X195  DAYS SINCE PMP                  00000290
13              VARIABLE    RN1*1000+RN1 SIX DIGIT RANDOM NUMBER                 00000300
14              VARIABLE    P8+K3  MISSION STORE + LAUNCH GATE SWITCH NUMBERS    00000310
15              VARIABLE    P8+K13 "MISSION CYCLIC FLYING HOUR" SWITCH NUMBERS   00000320
16              VARIABLE    P8+K18  NUMBER OF EACH MISSION FLOWN WITHOUT MA'S    00000330
17              VARIABLE    P8+K24  SAVEVALUE NUMBERS - FLIGHT HOURS BY MISSION  00000340
18              VARIABLE    FN4/2  ABORT FLIGHT TIME DURATION                    00000350
19              VARIABLE    (MX3(3,4)+240-V20)@240 TIME TO START OF 1ST SHIFT    00000360
20              VARIABLE    C1@240  TIME OF DAY-TENTHS OF HOURS                  00000370
21              VARIABLE    P14@MX1(1,10)  0=TIME FOR ALTERNATE DAILY            00000380
23              VARIABLE    FN6/10000  MANPOWER REQUIRED                         00000390
24              VARIABLE    FN6/100@100  WORK CENTER                            00000400
25              VARIABLE    FN6@100  MEAN ELAPSED TIME TO PERFORM EVENT          00000410
26              VARIABLE    P17+8   EVENT STORE NUMBER                           00000420
27              VARIABLE    P2+32  WORK CENTER QUEUE + 1ST SHIFT STORE NUMBERS  00000430
28              VARIABLE    P2+43  2ND SHIFT WORK CENTER STORE NUMBER           00000440
29              VARIABLE    P22*P20  MAN HOURS X 100                             00000450
30              VARIABLE    P2+8  SAVEVALUE NUMBERS OF MMH VS. WORK CENTER       00000460
31              VARIABLE    P2+43-P4*11  SKILL LINK NUMBERS                      00000470
32              VARIABLE    8+BV14  MATRIX COLUMN NUMBER-PMP/PMI ELAPSE TIME     00000480
33              VARIABLE    K2+BV14*8  MATRIX ROW NUMBER-PMP OR PMI,MEN          00000490
34              VARIABLE    K3+BV14*6  MATRIX ROW NUMBER-PMP OR PMI,TIME/MAN     00000500
35              VARIABLE    220-C1@240    TIME REMAINING SECOND SHIFT            00000510
36              VARIABLE    P3*P4  MAN HOURS X 100                               00000520
37              VARIABLE    P2+20  SAVEVALUE NUMBERS-PMP/PMI MAN HOURS BY WORK CEN00000530
38              VARIABLE    X1@C1-C1@240  TIME REMAINING - FIRST SHIFT           00000540
39              VARIABLE    P4-P20  EMT IN EXCESS OF CURRENT SHIFT LENGTH        00000550
40              VARIABLE    P2+29  SAVEVALUE NUMBERS, NUMBER OF P2 MA'S/EVENT    00000560
41              VARIABLE    P19+39  SAVEVALUE NUMBERS, NUMBER OF MA'S/P19 EVENT  00000570
42              VARIABLE    P3*100+P5  ELEMENT NUMBER                            00000580
45              VARIABLE    FN37/K1000  PROBABILITY OF R + R                     00000590
46              VARIABLE    P22/100  ELEMENT SYSTEM NUMBER                       00000600
47              VARIABLE    P1+25  PARAMETER IDENTIFICATION - WORK CENTER        00000610
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48      VARIABLE    FN40/10000  DS/GS WORK CENTER                                  00000620
49      VARIABLE    FN40@10000/100  ORGANIZATIONAL SECONDARY WORK CENTER          00000630
50      VARIABLE    FN40@100  ORGANIZATIONAL PRIMARY WORK CENTER                  00000640
51      VARIABLE    P1+20  PARAMETER IDENTIFICATION - M.P.                        00000650
52      VARIABLE    FN42/10000  DS/GS MANPOWER (M.P.)                           00000660
53      VARIABLE    FN42@10000/100  ORGANIZATIONAL SECONDARY M.P.               00000670
54      VARIABLE    FN42@100  ORGANIZATIONAL PRIMARY M.P.                       00000680
55      VARIABLE    KC+(FN43@1000*FN36+500)/1000  MEMT = R + K                 00000690
56      VARIABLE    P4*10  UNITS CONVERSION                                      00000700
57      VARIABLE    (MX1(4,5)*FN36+500)/1000  MEAN GSE DELAY TIME               00000710
58      VARIABLE    P2+37 SAVEVALUE NUMBERS-UNSCHEDULED MMH BY WORK CENTER       00000720
59      VARIABLE    1+6V4  MATRIX COLUMN IDENTIFICATION                          00000730
60      VARIABLE    M1*K10  UNITS CONVERSION                                     00000740
61      FVARIABLE   FN45*(1+(X1602/100))  SUPPLY DELAY                           00000750
62      VARIABLE    N$NORD-N$NORW  NORS TEST VALUE                               00000760
63      VARIABLE    P2+K49 SAVEVALUE NUMBERS-CANNIBALIZATION MMH BY WORK         00000770
64      VARIABLE    P1+C1  TIME WHEN PART BECOMES AVAILABLE                      00000780
65      VARIABLE    (FN43/1000*FN36+K500)/1000  OFF-EQUIPMENT RPR MEMT           00000790
66      VARIABLE    FN43/1000  OFF-EQUIPMENT REPAIR TIME                         00000800
67      VARIABLE    P28+K66  STORES INDEX FOR GS WORK CENTERS                    00000810
68      VARIABLE    P28+K45  QUEUE INDEX FOR GS WORK CENTERS                     00000820
69      VARIABLE    P28+K63 SAVEVALUE NUMBERS FOR WORK CENTER TOTAL MMH'S        00000830
70      VARIABLE    P31*P4  MAN HOURS X 100                                      00000840
71      VARIABLE    FN37@K1000  PERCENT ELEMENTS REPAIRED @ GS                   00000850
72      VARIABLE    FN47/1000  PERCENT ELEMENTS NRTS (1-8) @ GS                  00000860
73      VARIABLE    FN47@1000 PERCENT ELEMENTS NRTS (9) @ GS                     00000870
74      VARIABLE    P3+MX3(*2,4)-C1  DELAY TIME IN MPC/SHIFT ROUTINE             00000880
75      VARIABLE    P6-R*1  NUMBER OF MEN STILL REQUIRED                         00000890
77      VARIABLE    P4+43  SECOND SHIFT WORK CENTER CHAIN/STORE INDEX            00000900
78      VARIABLE    P4+32  FIRST SHIFT WORK CENTER CHAIN/STORE INDEX             00000910
79      VARIABLE    P3+P5  TIME INTERVAL                                         00000920
80      VARIABLE    P2+K4+4(K3-P14)  MANPOWER REDUCTION MATRIX INDEX             00000930
81      VARIABLE    K21+P4+K11(K3-P14)  MANPOWER CONTROL CHAIN/STORE INDEX       00000940
82      VARIABLE    P5-C1@P3  MANPOWER REDUCTION CONTROL TIME                    00000950
83      VARIABLE    P6-R*7  MANPOWER DIFFERENCE                                  00000960
84      VARIABLE    MX1(5,2)+MX1(5,3)+MX1(5,4)  MAN HOUR SUMMATION               00000970
135     VARIABLE    FN31/1000 ELEMENT PROBABILITY OF NOR                         00000980
136     VARIABLE    FN54@100  MANPOWER - ON EQUIPMENT REPAIR                     00000990
137     VARIABLE    FN54/K100  MANPOWER - ON EQUIPMENT REPAIR                    00001000
138     VARIABLE    (FN53/1000*FN36+500)/1000  EMET-ON EQUIPMENT REPAIR          00001010
139     VARIABLE    FN52/1000  PROBABILITY OF REPAIR BY IDS                      00001020
140     VARIABLE    FN52@1000  PROBABILITY OF REPAIR BY DS                       00001030
141     VARIABLE    P28+K77  STORES INDEX FOR DS WORK CENTERS                    00001040
142     VARIABLE    P28+56  QUEUE INDEX FOR DS WORK CENTERS                      00001050
143     VARIABLE    P28+95  SAVEVALUE NUMBERS FOR WORK CENTERS TOTAL MMH'S       00001060
144     VARIABLE    CH1+W$AKM14  AIRCRAFT AVAILABLE NEXT AM                      00001070
145     VARIABLE    240-P3-P2  NON-SHIFT HOURS                                   00001080
146     FVARIABLE   (MH6(26,P15)*RN1/1000)                                       00001090
*                               USE (MH6(10,P15)*RN1/1000) WITH TBO RUN          00001100
147     VARIABLE    P40@X189    GENERAL                                          00001110
148     VARIABLE    P40@X190    GENERAL                                          00001120
149     VARIABLE    MH6(P14,P12)*10-P40  TIME-ELEMENT REPLACEMENT DUE            00001130
150     VARIABLE    P40/10+MH6(26,*12)  NEXT TIME REPLACEMENT DUE                00001140
151     VARIABLE    P14+K200  SAVE VALUE NO-MISSIONS CALLED EA ACFT/MONTH        00001150
152     VARIABLE    P14+K800  SAVEVALUE NO-MISSIONS CALLED EA ACFT/SIMULA        00001160
153     VARIABLE    P14+K225  SAVEVALUE NO-MISSIONS COMPLETED EA ACFT/MON        00001170
154     VARIABLE    P14+K825  SAVEVALUE NO-MISSIONS COMPLETED EA ACFT/SIM       00001180
155     VARIABLE    P14+K250  SAVEVALUE NO-MISSION FLIGHT HR EA ACFT/MONTH      00001190
156     VARIABLE    P14+K850  SAVEVALUE NO- MISSION FLIGHT HR EA ACFT/SIMU      00001200
157     VARIABLE    P14+K275  SAVEVALUE NO-NUMBER OF PREFLIGHTS EA ACFT/MO      00001210
158     VARIABLE    P14+K875  SAVEVALUE NO-NO OF PREFLIGHTS EA ACFT/SIMU        00001220
159     VARIABLE    P14+K300  SAVEVALUE NO-PREFLIGHT MMH'S X 100 EA ACFT       00001230
160     VARIABLE    P14+K900  SAVEVALUE NO-PREFLIGHT MMH'SX100, EA ACFT/SI      00001240
161     VARIABLE    P14+K325  SAVEVALUE NO-NO OF DAILY'S EA ACFT/MONTH          00001250
162     VARIABLE    P14+K925  SAVEVALUE NO-NO OF DAILY'S, EA ACFT/SIMU          00001260
163     VARIABLE    P14+K350  SAVEVALUE NO-DAILY MMH'SX100, EA ACFT,MONTH      00001270
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164   VARIABLE   P14+K550  SAVEVALUE NO-DAILY MMH*5X100, EA ACFT MON    00001280
165   VARIABLE   P14+575  SAVEVALUE NO-PMI'S BY AIRCRAFT S/N / MONTH    00001290
166   VARIABLE   P14+975 SAVEVALUE NO-PMI'S BY AIRCRAFT S/N/SIMULATION 00001300
167   VARIABLE   P14+600  SAVEVALUE NO-MONTHLY PMI MAN HR BY ACFT S/N   00001310
168   VARIABLE   P14+1000  SAVEVALUE NO-SIMULATION PMI MAN HR BY ACFT S00001320
169   VARIABLE   P14+425  SAVEVALUENO-PMP'S BY ACFT S/N/MONTH          00001330
170   VARIABLE   P14+1025  SAVEVALUE NO-PMP'S BY ACFT S/N/SIMULATION   00001340
171   VARIABLE   P14+450  SAVEVALUE NO-PMP MMH BY ACFT S/N/MONTH       00001350
172   VARIABLE   P14+1050  SAVEVALUE NO-PMP MMH BY ACFT S/N/SIMULATION 00001360
173   VARIABLE   P14+475  SAVEVALUE NO-UMA BY ACFT S/N/MONTH           00001370
174   VARIABLE   P14+1075  SAVEVALUE NO-UMA BY ACFT S/N/SIMULATION     00001380
175   VARIABLE   P14+500  SAVEVALUE NO-SMA BY ACFT S/N / MONTH        00001390
176   VARIABLE   P14+1100  SAVEVALUE NO-SMA BY ACFT S/N / SIMULATION   00001400
177   VARIABLE   P5+525  SAVEVALUE NO-SCHEDULED MAINT MH BY ACFT S/N/M00001410
178   VARIABLE   K300+P5 PARAMETERS 1-4 OFFSET VALUES FOR SAVEVALUE IN 00001420
179   VARIABLE   K350+P5 PARAMETERS 1-4 OFFSET VALUES FOR SAVEVALUE IN 00001430
180   VARIABLE   K400+P5 PARAMETERS 1-4 OFFSET VALUES FOR SAVEVALUE IN 00001440
181   VARIABLE   K450+P5 PARAMETERS 1-4 OFFSET VALUES FOR SAVEVALUE IN 00001450
182   VARIABLE   X*1+X*2+X*3+X*4  SAVEVALUE SUMMATION                   00001460
183   VARIABLE   X325+X375+X425+X475  SAVEVALUE SUMMATION               00001470
184   VARIABLE   P14+1175 SAVEVALUE NO-SIMULATION-SCHEDULED MA'S BY AC 00001480
185   VARIABLE   P14+575  SAVEVALUE NO-MONTHLY-SCHEDULED MA'S BY ACFT  00001490
186   VARIABLE   P14+1200  SAVEVALUE NO-SIM ELAPSED UNSCH MAINT ACFT   00001500
187   VARIABLE   P14+600  SAVEVALUE NO-MONTHLY ELAPSED UNSCH MAINT A/C 00001510
188   VARIABLE   P5+1125  SAVEVALUE NO-SIMULATION TOTAL SCHED MAINT MH 00001520
189   VARIABLE   P14+550  SAVEVALUE NO-MONTHLY SCHED MAINT MH BY ACFT  00001530
190   VARIABLE   P14+1150  SAVEVALUE NO-SIMULATION SCHED MAINT MH BY AC00001540
191   VARIABLE   P20*P22  MAN HOURS X 100                              00001550
192   VARIABLE   P14+1225  SAVEVALUE NO-SIMULATION DIR MAINT MH BY ACFT00001560
193   VARIABLE   K625+P6  SAVEVALUE NO-MONTHLY DIR MAINT MH BY ACFT S 00001570
194   VARIABLE   K1250+P14  SAVEVALUE NO-SIMULATION NORM TIME (.1 HR)  00001580
195   VARIABLE   K650+P14  SAVEVALUE NO-MONTHLY NORM TIME (.1 HR)      00001590
204   VARIABLE   K1350+P14  SAVEVALUE NO-SSIMULATION TEST HOPS BY ACFT 00001600
205   VARIABLE   K750+P14  SAVEVALUE NO-MONTHLY TEST HOPS BY ACFT S/N  00001610
206   VARIABLE   K1375+P14  TEST HOP FLT.HRS SAVE NO.S.-TOTAL          00001620
207   VARIABLE   K775+P14  TEST HOP FLT.HRS SAVE NO.S.-MONTHLY         00001630
208   VARIABLE   K1475+P14  FLT.ABORTS- SAVE NO.S - TOTAL              00001640
209   VARIABLE   K1425+P14  FLT.ABORTS- SAVE NO.S - MONTHLY            00001650
210   VARIABLE   K1500+P14  ABORT FLIGHT HOURS- SAVE NO'S-TOTAL        00001660
211   VARIABLE   K1450+P14  ABORT FLIGHT HOURS- SAVE NO'S-MONTHLY      00001670
212   VARIABLE   (X*1+X*2)*10  SAVEVALUE SUMMATION + UNITS CONVERSION  00001680
213   VARIABLE   P7/(X*3+X*4+X*5)  CONVERSION TO RATIOS                00001690
214   VARIABLE   (X550+X575)*10/(X275+X800+X1475) AVAIL. CALC.         00001700
215   VARIABLE   X275+X800+X1475  SAVEVALUE SUMMATION                  00001710
216   FVARIABLE  (C1-X*1-X*3-X*4)*10000/C1                             00001720
217   FVARIABLE  (X191*C1-X675-X1425-X1600-X1750)*10000/(X191*C1)      00001730
218   FVARIABLE  X*1*10000/X*2  ACFT MONTHLY AVAIL PERCENT MISSIONS CUM00001740
219   FVARIABLE  (X*1+X*2)*10000/X*3  ACFT MONTHLY AVAIL, MISSIONS RAT100001750
220   FVARIABLE  (X250+X1450)*10000/X225  PLAT.MONTHLY AVAIL-MISS.RAT100001760
221   FVARIABLE  X250*10000/X225 PLATOON MONTHLY AVAIL, PERCENT MISS C00001770
222   VARIABLE   P14+K525 SAVEVALUE NO-MONTHLY SCHED MAINT MH BY ACFT  00001780
223   VARIABLE   P14+K1125 SAVEVALUE NO-SIMULATION SCHED MAINT MH BY AC00001790
224   VARIABLE   G1+G32+G30+G37                                        00001800
225   VARIABLE   (G31+G32)*K80                                         00001810
226   VARIABLE   (G31+G32)*560                                         00001820
227   VARIABLE   (G30+G37)*K80                                         00001830
228   VARIABLE   (G30+G37)*K560                                        00001840
229   FVARIABLE  (XH11/(XH11+(X188/10)))*10000                         00001850
230   FVARIABLE  (XH11/(XH11+(X188/10)+X187))*10000                    00001860
231   VARIABLE   (RN1*K1000+RN1)@X189                                  00001870
232   VARIABLE   P14+K1400                                             00001880
233   VARIABLE   C1-P48                                                00001890
234   VARIABLE   X189-FN4     GENERAL                                  00001900
235   VARIABLE   X190-FN4     GENERAL                                  00001910
236   VARIABLE   X195-X196          PMP CALENDAR                       00001920
237   VARIABLE   720-1440                                              00001930
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238  VARIABLE  P40-P49                                                    00001940
239  VARIABLE  C1-P46                                                     00001950
240  VARIABLE  P1+325                                                     00001960
243  VARIABLE  MX1(5,1)-P10                                               00001961
244  VARIABLE  1660+P14                                                   00001962
245  VARIABLE  MX1(5,1)-K2                                                00001963
241  VARIABLE  P1+225                                                     00001970
266  VARIABLE  C1@1680/240                                        NORA    00001975
268  VARIABLE  FN70/10000                                                 00001980
269  VARIABLE  FN70@10000/100   SEC. W.C. RGR                             00001990
270  VARIABLE  FN70@100         PRI. W.C. RGR                             00002000
267  VARIABLE  C1@1680/240+11    DAY OF WEEK+10 FOR LAUNCH MATRICES       00002010
1    BVARIABLE V20'G'250           DUMMY NO POST FLIGHT                   00002020
2    BVARIABLE V20'G'250          DUMMY NO RESPOT                         00002030
3    BVARIABLE V20'L'K166*V20'G'K59                                       00002040
4    BVARIABLE P25'L'K1359                                                00002050
7    BVARIABLE V20'L'250                                                  00002060
11   BVARIABLE V20'LE'X199*V20'GE'MX1(1,2)*V233'GE'X200                   00002070
14   BVARIABLE P17'E'K8                                                   00002080
17   BVARIABLE V144'L'X194*P8'E'1*P26'E'1  OVERTIME TEST                  00002090
18   BVARIABLE P19'E'2+P19'E'5                                            00002100
19   BVARIABLE V20'G'MX3(3,4)*V20'L'X1601*LR14*CH60'E'0           NORA    00002110
20   BVARIABLE V20'G'MX1(1,2)*V239'GE'720                                 00002120
1    MATRIX    H,10,22                                                    00002130
2    MATRIX    H,2,2                                                      00002140
3    MATRIX    H,45,9                                                     00002150
5    MATRIX    H,45,9                                                     00002160
6    MATRIX    H,28,28                                                    00002170
11   MATRIX    H,10,12                                                    00002180
12   MATRIX    H,10,12                                                    00002190
13   MATRIX    H,10,12                                                    00002200
14   MATRIX    H,10,12                                                    00002210
15   MATRIX    H,10,12                                                    00002220
16   MATRIX    H,10,12                                                    00002230
17   MATRIX    H,10,12                                                    00002240
1    MATRIX    X,15,13                                                    00002250
2    MATRIX    X,15,27                                                    00002260
3    MATRIX    X,12,11                                                    00002270
4    MATRIX    X,2,40                                                     00002280
5    MATRIX    X,45,9                                                     00002290
1    TABLE     P17,0,1,27    NUMBER INSPECTIONS PERFORMED                 00002300
2    TABLE     P8,0,1,11     FLIGHTS BY MISSION TYPE                      00002310
3    TABLE     P17,0,1,27    NUMBER INSPECTIONS                           00002320
4    TABLE     P19,0,1,27    MA'S BY WHEN DISCOVERED                      00002330
5    TABLE     P3,0,1,45     MA'S BY SYSTEM                               00002340
6    TABLE     P19,0,1,27    MA'S BY SYSTEM + WHEN DISCOVERED             00002350
7    TABLE     FN46,0,1,300                                               00002360
8    TABLE     V56,20,20,125 ORGANIZATIONAL MTTR                          00002370
9    TABLE     V60,100,100,250 DOWNTIME DISTRIBUTION                      00002380
10   TABLE     FN46,0,1,300  NORS EVENTS                                  00002390
11   TABLE     FN46,0,1,300  CANNIBALIZED PARTS                          00002400
12   TABLE     FN46,0,1,300  PARTS CAUSING NORS OR CANNIBALIZATION        00002410
13   TABLE     FN46,0,1,300  PARTS R AND R BY SERVICE PLATOON             00002420
14   TABLE     V56,0,20,125      MTTR FOR OFF AIRCRAFT PART REPAIR        00002430
15   TABLE     FN46,0,1,300                                               00002440
18   TABLE     V20,83,1,60     TIME OF START OF DAILY                     00002441
19   TABLE     P24,0,1,50    DEFERRED MA'S                                00002450
     STORAGE   S33,20                                                     00002460
     STORAGE   S34,90                                                     00002461
     STORAGE   S35,270                                                    00002462
     STORAGE   S36,30                                                     00002463
     STORAGE   S37,20                                                     00002464
     STORAGE   S38,10                                                     00002465
     STORAGE   S39,10                                                     00002466
     STORAGE   S40,20                                                     00002467
     STORAGE   S41,20                                                     00002469
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         STORAGE    542,20                                                  00002470
         STORAGE    543-554,899                                             00002471
*                                                                           00002480
*                                                                           00002490
*                                                                           00002500
 1       FUNCTION   P4,D2        RECONFIGURATION SORT                       00002510
0        1      1    1                                                      00002520
*                                                                           00002530
*                                                                           00002540
 2       FUNCTION   P17,D8       GROUP EVENT PROB OF SUCCESS                00002550
1        9999992    9576975      9999998     +8171311    99999916    81378100002560
17       00002021   960000                                                  00002570
*                                                                           00002580
*                                                                           00002590
 3       FUNCTION   P8,D2        PROB NO MA DURING FLIGHT                   00002600
0        8941221    757472                                                  00002610
*                                                                           00002620
*                                                                           00002630
 4       FUNCTION   P8,D2        MISSION DURATION                           00002640
0        7      1    14                                                     00002650
*                                                                           00002660
*                                                                           00002670
 5       FUNCTION   P8,D2        PROB OF NO ABORT/MA IN FLIGHT              00002680
0        8891361    889186                                                  00002690
*                                                                           00002700
*                                                                           00002710
 6       FUNCTION   P17,D2       LINE MAINTENANCE MANPOWER,MOS,+DURATION    00002720
2        20030916   200327                                                  00002730
*                                                                           00002740
*                                                                           00002750
 7       FUNCTION   P17,D10      MAINTENANCE PRIORITY                       00002760
1        1      2    5      3    28     8     29     11    10     12    5    00002770
16       15     17   30     22   20     23    25                            00002780
*                                                                           00002790
*                                                                           00002800
 8       FUNCTION   P17,D2       QUEUE LIMIT GROUND EVENTS                  00002810
1        6      3    999999                                                  00002820
*                                                                           00002830
*                                                                           00002840
 9       FUNCTION   P19,E9             WHEN DISCOVERED SORT MULTI-FAILURES  00002850
 2       FN11   5    FN13   6    FN10   7     FN10   8     FN56   12   FN11  00002860
 16      FN12   17   FN14   21   FN51                                        00002870
*                                                                           00002880
*                                                                           00002890
 10      FUNCTION   RN1,D4       PROB MULT MA/MA DURING FLIGHT              00002900
0.86571     0.98762     0.99913     0.99994                                 00002910
*                                                                           00002920
*                                                                           00002930
 11      FUNCTION   RN1,D3       PROB MULT MA/MA DURING PREFLIGHT           00002940
0.97851     0.99972     0.99993                                             00002950
*                                                                           00002960
*                                                                           00002970
 12      FUNCTION   RN1,D4       PROB MULT MA/MA DURING DAILY               00002980
0.90051     0.99332     0.99973     0.99994                                 00002990
*                                                                           00003000
*                                                                           00003010
 13      FUNCTION   RN1,D2       PROB MULT MA/MA DURING AIRCREW             00003020
0.99101     0.99992                                                         00003030
*                                                                           00003040
*                                                                           00003050
 14      FUNCTION   RN1,D25      PROB MULT MA/MA PMP                        00003060
0.00021     0.00142     0.00563     0.01694     0.04145     0.08576         00003070
0.15437     0.24718     0.35899     0.480010    0.599211    0.706812        00003080
0.796513    0.865914    0.916015    0.950016    0.971617    0.984618        00003090
0.992019    0.996120    0.998121    0.999122    0.999623    0.999824        00003100
0.999975                                                                    00003110
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*                                                                                00003120
*                                                                                00003130
 15    FUNCTION   P19,E8      WHEN DISCOVERED SORT SYSTEM FAILURE                 00003140
2      FN19  5    FN16  6     FN17  7     FN18  8     FN57  12    FN19            00003150
16     FN20  17   FN21                                                           00003160
*                                                                                00003170
*                                                                                00003180
 16    FUNCTION   RN1,D21     PROB SYSTEM MA AIRCREW/MA AIRCREW                   00003190
0.180201    0.189202    0.207203    0.252304    0.342305    0.531506            00003200
0.617107    0.716208    0.725209    0.842310    0.878411    0.891912            00003210
0.905413    0.914414    0.936915    0.955019    0.959520    0.968522            00003220
0.973023    0.977524    0.999925                                                00003230
*                                                                                00003240
*                                                                                00003250
 17    FUNCTION   RN1,D20     PROB SYSTEM MA IN-FLIGHT/MA IN-FLIGHT               00003260
0.008701    0.030702    0.042703    0.076104    0.089505    0.171606            00003270
0.251607    0.275008    0.333009    0.357710    0.415711    0.443712            00003280
0.465713    0.483714    0.641915    0.780816    0.874317    0.915718            00003290
0.973119    0.999920                                                            00003300
*                                                                                00003310
*                                                                                00003320
 18    FUNCTION   RN1,D15     PROB SYSTEM MA ABORT IN-FLT/MA ABT IN-FLT           00003330
0.021001    0.027002    0.105304    0.147505    0.286106    0.406607            00003340
0.557211    0.587312    0.629513    0.665614    0.743915    0.810216            00003350
0.816217    0.954819    0.999920                                                00003360
*                                                                                00003370
*                                                                                00003380
 19    FUNCTION   RN1,D20     PROB SYSTEM MA PREFLIGHT/MA PREFLIGHT               00003390
0.082401    0.139202    0.193603    0.357704    0.372705    0.500606            00003400
0.543207    0.572308    0.682309    0.686610    0.774711    0.793912            00003410
0.806113    0.851814    0.912915    0.946316    0.958417    0.960218            00003420
0.981219    0.999920                                                            00003430
*                                                                                00003440
*                                                                                00003450
 20    FUNCTION   RN1,D20     PROB SYSTEM MA DAILY/MA DAILY                       00003460
0.045301    0.102702    0.119503    0.225604    0.279005    0.418906            00003470
0.550807    0.557408    0.638209    0.645710    0.730811    0.733412            00003480
0.745113    0.778614    0.811515    0.822316    0.836817    0.841918            00003490
0.973219    0.999920                                                            00003500
*                                                                                00003510
*                                                                                00003520
 21    FUNCTION   RN1,D20     PROB SYSTEM MA PMP/MA PMP                           00003530
0.120101    0.235002    0.254903    0.435604    0.471305    0.577906            00003540
0.648107    0.652108    0.685309    0.698610    0.736411    0.760212            00003550
0.770813    0.782314    0.856715    0.884916    0.897517    0.899818            00003560
0.985119    0.999920                                                            00003570
*                                                                                00003580
*                                                                                00003590
 22    FUNCTION   P3,L20      NUMBER OF ELEMENTS IN SYSTEMS                       00003600
01   20    02   24    03   13    04   32    05   8     06   23                   00003610
07   22    08   5     09   16    10   11    11   13    12   5                    00003620
13   8     14   11    15   26    16   15    17   14    18   7                    00003630
19   15    20   6                                                               00003640
*                                                                                00003650
*                                                                                00003660
 23    FUNCTION   P19,E8      WHEN DISCOVERED SORT ELEMENT FAILURE                00003670
2      FN27  5    FN24  6     FN25  7     FN26  8     FN58  12    FN27            00003680
16     FN28  17   FN29                                                           00003690
*                                                                                00003700
*                                                                                00003710
 24    FUNCTION   FN46,L241   PROB ELEMENT MA AIRCREW/MA SYS AIRCREW              00003720
0101 025  0102 000  0103 050  0104 025  0105 050  0106 150                       00003730
0107 125  0108 050  0109 050  0110 075  0111 100  0112 000                       00003740
0113 075  0114 100  0115 075  0116 050  0201 000  0202 999                       00003750
0203 000  0204 000  0205 000  0301 250  0302 250  0303 250                       00003760
0304 250  0305 000  0401 000  0402 200  0403 000  0404 000                       00003770
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1506  0000001507  0000001508  0000001509  0000001510  0000001511  00000000009060
1512  0000001513  0000001514  0000001515  0000001516  0000001517  00000000009070
1518  0000001519  0000001520  0000001521  0000001522  0000001523  00000000009080
1524  0000001525  0000001526  0280001601  0000001602  0000001603  00000000009090
1604  0000001605  0000001606  0000001607  0000001608  0000001609  00000000009100
1610  0000001611  0000001612  5000001613  0000001614  0000001615  09302300009110
1701  0000001702  0000001703  0000001704  0000001705  0000001706  00000000009120
1707  0000001708  0000001709  0000001710  0000001711  0000001712  00000000009130
1713  0000001714  0000001801  0000001802  0000001803  0000001804  00000000009140
1805  0000001806  0000001807  0000001901  0763361902  2666671903  00000000009150
1904  0000001905  0000001906  0000001907  1666671908  0000001909  00000000009160
1910  1666661911  1666661912  0000001913  2358491914  3030301915  14973300009170
2001  0000002002  0000002003  0000002004  9999992005  0000002006  00000000009180
2007  0000002008  171674                                          00009190
*                                                                 00009200
*                                                                 00009210
 36    FUNCTION    RN5,C25       LOG NORMAL DISTRIBUTION          00009220
0       0      .025  332   .050  388   .100  466   .150  527   .200  580  00009230
.250    631    .300  680   .400  779   .500  883   .600  1003  .700  1148 00009240
.750    1237   .800  1345  .850  1482  .900  1675  .920  1782  .940  1921 00009250
.960    2119   .970  2261  .980  2465  .990  2845  .995  3200  .999  4183 00009260
.9998   5185                                                      00009270
*                                                                 00009280
 37    FUNCTION    FN46,L296     PERCENT REM & REPL,PERCENT GS RPR/RCD  00009290
0101  9990000102  9990000103  9990000104  5000000105  0000000106  00000000009300
0107  0000000108  9990000109  9990000110  9990000111  0000000112  00000000009310
0113  9990000114  9990000115  0000000116  0000000117  5000000118  00000000009320
0119  9990000120  5800000201  9990000202  9990000203  0000000204  99900000009330
0205  9990000206  9990000207  9990000208  9990000209  9990000210  99900000009340
0211  9990000212  8240000213  9990000214  8820000215  8180000216  76900000009350
0217  9720000218  9990000219  9990000220  9990000221  9990000222  99900000009360
0223  9990000224  8040000301  9990000302  9990000303  9990000304  66700000009370
0305  9990000306  9990000307  9990000308  9990000309  9990000310  99900000009380
0311  9990000312  9990000313  8410000401  2860000402  0000000403  00000000009390
0404  2380000405  0910000406  9990000407  3000000408  0000000409  92300000009400
0410  9090000411  8390000412  8570000413  9990000414  0000000415  99900000009410
0416  9990000417  9990000418  9990000419  8330000420  8330000421  83300000009420
0422  8330000423  8330000424  8330000425  9990000426  9990000427  99900000009430
0428  8110000429  8110000430  8110000431  8110000432  6130000501  99900000009440
0502  8750000503  9990000504  9990000505  9990000506  9990000507  94700000009450
0508  8240000601  9990000602  9290000603  9990000604  3640000605  25000000009460
0606  9990000607  5000000608  7500000609  5000000610  9990000611  99900000009470
0612  2640000613  9990000614  6830000615  9990000616  9990000617  99900000009480
0618  7500000619  9990000620  9990000621  6880000622  5000000623  65200000009490
0701  9990000702  9990000703  3330000704  6670000705  9990000706  87900000009500
0707  0000000708  9990000709  8890000710  9990000711  8000000712  68200000009510
0713  9990000714  9990000715  5000000716  9990000717  9990000718  99900000009520
0719  5000000720  5000000721  9990000722  6020000801  9990000802  99900000009530
0803  9330000804  9230000805  9380000901  2860000902  8890000903  99900000009540
0904  9990000905  9990000906  9990000907  9990000908  9990000909  99900000009550
0910  9990000911  9990000912  9990000913  9990000914  9990000915  99900000009560
0916  8110001001  0000001002  9990001003  6670001004  0000001005  62500000009570
1006  0000001007  8180001008  9990001009  9990001010  0000001011  78600000009580
1101  6540001102  0000001103  8820001104  8330001105  9990001106  75000000009590
1107  9990001108  9990001109  9990001110  9990001111  6670001112  85700000009600
1113  8810001201  7780001202  9990001203  9990001204  5000001205  90700000009610
1301  9990001302  9990001303  9990001304  6000001305  9990001306  83300000009620
1307  8890001308  7780001401  9990001402  9990001403  9990001404  83300000009630
1405  9990001406  9990001407  9990001408  9990001409  9990001410  99900000009640
1411  5530001501  9630001502  7140001503  8330001504  6670001505  66700000009650
1506  9990001507  9990001508  5000001509  9990001510  7500001511  80000000009660
1512  9990001513  6000001514  9990001515  9990001516  9990001517  60000000009670
1518  7500001519  5490001520  9380001521  9990001522  7140001523  66700000009680
1524  5710001525  5710001526  7150001601  7780001602  9740001603  99900000009690
1604  7860001605  6000001606  0000001607  5000001608  6000001609  99900000009700
1610  8570001611  9990001612  9990001613  6670001614  9990001615  74500000009710
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1701 6670001702 9990001703 9990001704 9090001705 9990001706 0000000009720
1707 6670001708 9990001709 9420001710 9990001711 1670001712 6670000009730
1713 9990001714 6470001801 9570001802 9990001803 8400001804 9990000009740
1805 7560001806 9990001807 7500001901 9990001902 9990001903 5000000009750
1904 9990001905 9990001906 8750001907 6360001908 8570001909 8570000009760
1910 5710001911 5710001912 0000001913 0500001914 9990001915 5670000009770
2001 7860002002 9990002003 8330002004 5000002005 6670002006 5000000009780
2007 5000002008 873000                                                  00009790
 38   FUNCTION   FN46,L296   PROB OF PART AVAILABILITY                    00009800
0101 999 0102 999 0103 999 0104 999 0105 999 0106 999                   00009810
0107 999 0108 999 0109 999 0110 999 0111 999 0112 999                   00009820
0113 999 0114 999 0115 999 0116 999 0117 999 0118 999                   00009830
0119 999 0120 909 0201 999 0202 999 0203 999 0204 999                   00009840
0205 999 0206 999 0207 999 0208 999 0209 999 0210 999                   00009850
0211 999 0212 857 0213 999 0214 733 0215 999 0216 999                   00009860
0217 800 0218 999 0219 400 0220 999 0221 999 0222 999                   00009870
0223 999 0224 932 0301 999 0302 999 0303 000 0304 999                   00009880
0305 999 0306 000 0307 999 0308 999 0309 999 0310 999                   00009890
0311 999 0312 999 0313 854 0401 000 0402 999 0403 999                   00009900
0404 000 0405 999 0406 999 0407 272 0408 999 0409 600                   00009910
0410 867 0411 143 0412 999 0413 999 0414 999 0415 000                   00009920
0416 999 0417 833 0418 667 0419 500 0420 500 0421 500                   00009930
0422 500 0423 500 0424 500 0425 999 0426 999 0427 500                   00009940
0428 600 0429 600 0430 600 0431 600 0432 800 0501 667                   00009950
0502 429 0503 724 0504 999 0505 999 0506 999 0507 999                   00009960
0508 857 0601 999 0602 900 0603 999 0604 999 0605 999                   00009970
0606 999 0607 999 0608 999 0609 999 0610 999 0611 000                   00009980
0612 963 0613 999 0614 804 0615 999 0616 999 0617 800                   00009990
0618 694 0619 999 0620 999 0621 875 0622 833 0623 843                   00010000
0701 999 0702 875 0703 999 0704 999 0705 999 0706 999                   00010010
0707 999 0708 889 0709 919 0710 976 0711 999 0712 630                   00010020
0713 700 0714 999 0715 999 0716 600 0717 999 0718 999                   00010030
0719 999 0720 999 0721 999 0722 538 0801 999 0802 714                   00010040
0803 999 0804 583 0805 923 0901 999 0902 999 0903 999                   00010050
0904 999 0905 500 0906 750 0907 667 0908 750 0909 999                   00010060
0910 999 0911 980 0912 999 0913 999 0914 999 0915 999                   00010070
0916 873 1001 999 1002 999 1003 999 1004 999 1005 556                   00010080
1006 999 1007 999 1008 999 1009 999 1010 999 1011 400                   00010090
1101 000 1102 999 1103 000 1104 000 1105 999 1106 167                   00010100
1107 800 1108 875 1109 999 1110 999 1111 999 1112 636                   00010110
1113 787 1201 999 1202 864 1203 999 1204 999 1205 806                   00010120
1301 857 1302 999 1303 999 1304 999 1305 857 1306 400                   00010130
1307 750 1308 722 1401 000 1402 999 1403 999 1404 600                   00010140
1405 999 1406 999 1407 500 1408 000 1409 000 1410 999                   00010150
1411 250 1501 962 1502 999 1503 999 1504 999 1505 500                   00010160
1506 999 1507 000 1508 000 1509 999 1510 999 1511 999                   00010170
1512 000 1513 999 1514 999 1515 999 1516 999 1517 999                   00010180
1518 333 1519 500 1520 933 1521 999 1522 999 1523 999                   00010190
1524 000 1525 000 1526 808 1601 867 1602 639 1603 999                   00010200
1604 909 1605 719 1606 999 1607 999 1608 999 1609 200                   00010210
1610 667 1611 999 1612 500 1613 999 1614 999 1615 855                   00010220
1701 999 1702 999 1703 999 1704 950 1705 999 1706 999                   00010230
1707 999 1708 999 1709 959 1710 999 1711 999 1712 999                   00010240
1713 999 1714 900 1801 909 1802 500 1803 999 1804 999                   00010250
1805 999 1806 999 1807 333 1901 999 1902 774 1903 750                   00010260
1904 143 1905 400 1906 900 1907 333 1908 000 1909 000                   00010270
1910 650 1911 650 1912 999 1913 999 1914 250 1915 843                   00010280
2001 818 2002 900 2003 999 2004 667 2005 999 2006 999                   00010290
2007 667 2008 933                                                       00010300
 39   FUNCTION   P1,E3   VARIABLE SORT FOR WORK CENTER                   00010310
1     V50  2     V49  3     V48                                         00010320
*                                                                       00010330
*                                                                       00010340
 40   FUNCTION   FN46,L296   SKILL CODE-WORK CENTER ON A/C REPAIR        00010350
0101 0000000102 0000000103 0000000104 0000030105 0003070106 0003070010360
0107 0003070108 0000000109 0000000110 0000000111 0000070112 0001040010370
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0113  13    0114  14    0115  15    0116  16    0117  17    0118  18    00013020
0119  19    0120  20    0201  21    0202  22    0203  23    0204  24    00013030
0205  25    0206  26    0207  27    0208  28    0209  29    0210  30    00013040
0211  31    0212  32    0213  33    0214  34    0215  35    0216  36    00013050
0217  37    0218  38    0219  39    0220  40    0221  41    0222  42    00013060
0223  43    0224  44    0301  45    0302  46    0303  47    0304  48    00013070
0305  49    0306  50    0307  51    0308  52    0309  53    0310  54    00013080
0311  55    0312  56    0313  57    0401  58    0402  59    0403  60    00013090
0404  61    0405  62    0406  63    0407  64    0408  65    0409  66    00013100
0410  67    0411  68    0412  69    0413  70    0414  71    0415  72    00013110
0416  73    0417  74    0418  75    0419  76    0420  77    0421  78    00013120
0422  79    0423  80    0424  81    0425  82    0426  83    0427  84    00013130
0428  85    0429  86    0430  87    0431  88    0432  89    0501  90    00013140
0502  91    0503  92    0504  93    0505  94    0506  95    0507  96    00013150
0508  97    0601  98    0602  99    0603  100   0604  101   0605  102   00013160
0606  103   0607  104   0608  105   0609  106   0610  107   0611  108   00013170
0612  109   0613  110   0614  111   0615  112   0616  113   0617  114   00013180
0618  115   0619  116   0620  117   0621  118   0622  119   0623  120   00013190
0701  121   0702  122   0703  123   0704  124   0705  125   0706  126   00013200
0707  127   0708  128   0709  129   0710  130   0711  131   0712  132   00013210
0713  133   0714  134   0715  135   0716  136   0717  137   0718  138   00013220
0719  139   0720  140   0721  141   0722  142   0801  143   0802  144   00013230
0803  145   0804  146   0805  147   0901  148   0902  149   0903  150   00013240
0904  151   0905  152   0906  153   0907  154   0908  155   0909  156   00013250
0910  157   0911  158   0912  159   0913  160   0914  161   0915  162   00013260
0916  163   1001  164   1002  165   1003  166   1004  167   1005  168   00013270
1006  169   1007  170   1008  171   1009  172   1010  173   1011  174   00013280
1101  175   1102  176   1103  177   1104  178   1105  179   1106  180   00013290
1107  181   1108  182   1109  183   1110  184   1111  185   1112  186   00013300
1113  187   1201  188   1202  189   1203  190   1204  191   1205  192   00013310
1301  193   1302  194   1303  195   1304  196   1305  197   1306  198   00013320
1307  199   1308  200   1401  201   1402  202   1403  203   1404  204   00013330
1405  205   1406  206   1407  207   1408  208   1409  209   1410  210   00013340
1411  211   1501  212   1502  213   1503  214   1504  215   1505  216   00013350
1506  217   1507  218   1508  219   1509  220   1510  221   1511  222   00013360
1512  223   1513  224   1514  225   1515  226   1516  227   1517  228   00013370
1518  229   1519  230   1520  231   1521  232   1522  233   1523  234   00013380
1524  235   1525  236   1526  237   1601  238   1602  239   1603  240   00013390
1604  241   1605  242   1606  243   1607  244   1608  245   1609  246   00013400
1610  247   1611  248   1612  249   1613  250   1614  251   1615  252   00013410
1701  253   1702  254   1703  255   1704  256   1705  257   1706  258   00013420
1707  259   1708  260   1709  261   1710  262   1711  263   1712  264   00013430
1713  265   1714  266   1801  267   1802  268   1803  269   1804  270   00013440
1805  271   1806  272   1807  273   1901  274   1902  275   1903  276   00013450
1904  277   1905  278   1906  279   1907  280   1908  281   1909  282   00013460
1910  283   1911  284   1912  285   1913  286   1914  287   1915  288   00013470
2001  289   2002  290   2003  291   2004  292   2005  293   2006  294   00013480
2007  295   2008  296                                                    00013490
*                                                                        00013500
*                                                                        00013510
 47    FUNCTION    P22,02    PERGENT NRTS (1-8), PERCENT NRTS (1-9)      00013520
101   0     2008  0                                                      00013530
*                                                                        00013540
*                                                                        00013550
 48    FUNCTION    FN46,L296    PROb OF NU CANNIBALIZATION GIVEN NORS     00013560
0101  999   0102  999   0103  999   0104  999   0105  999   0106  999   00013570
0107  999   0108  999   0109  999   0110  999   0111  999   0112  999   00013580
0113  999   0114  999   0115  999   0116  999   0117  999   0118  999   00013590
0119  999   0120  667   0201  999   0202  999   0203  999   0204  999   00013600
0205  999   0206  999   0207  999   0208  999   0209  999   0210  999   00013610
0211  999   0212  000   0213  999   0214  250   0215  999   0216  999   00013620
0217  571   0218  999   0219  999   0220  999   0221  999   0222  999   00013630
0223  999   0224  667   0301  999   0302  999   0303  000   0304  999   00013640
0305  999   0306  667   0307  999   0308  999   0309  999   0310  999   00013650
0311  999   0312  999   0313  667   0401  999   0402  999   0403  999   00013660
0404  333   0405  999   0406  999   0407  429   0408  999   0409  000   00013670
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1113  0004091201  0008031202  0000001203  0000001204  0000101205  00010900015000
1301  0000001302  0000001303  0000001304  0000101305  0000001306  00001000015010
1307  0000101308  0008031401  0000001402  0000001403  0000001404  00002000015020
1405  0000001406  0000001407  0000001408  0000001409  0000001410  00000000015030
1411  0002101501  0000301502  0000101503  0000101504  0000101505  00001000015040
1506  0000001507  0000001508  0000101509  0000001510  0000161511  00001000015050
1512  0000001513  0005151514  0000001515  0000001516  0000001517  00001000015060
1518  0000101519  0003131520  0005051521  0000001522  0000101523  00001000015070
1524  0004081525  0000101526  0008031601  0000101602  0000101603  00000000015080
1604  0000111605  0000181606  0000101607  0000101608  0000101609  00000000015090
1610  0000101611  0000001612  0000001613  0000101614  0000001615  00001200015100
1701  0007031702  0000001703  0000001704  0000101705  0000001706  00001000015110
1707  0000101708  0000001709  0000101710  0000001711  0006041712  00001000015120
1713  0000001714  0000101801  0000101802  0000001803  0000101804  00000000015130
1805  0000101806  0000001807  0000101901  0000001902  0000001903  00001000015140
1904  0000001905  0000001906  0003071907  0004191908  0015051909  00150500015150
1910  0010031911  0010031912  0003191913  0002091914  0000001915  00050800015160
2001  0000102002  0000002003  0000102004  0003142005  0000202006  00020800015170
2007  0000172008  000509                                          00015180
 55    FUNCTION   P1,E3                                          00015190
1      V136  2    V137  3    V52                                  00015200
*                                                                 00015210
 56    FUNCTION   RN1,D6      PROB MULT MA/MA PMI                 00015220
0.67891      0.92692      0.98713      0.99824      0.99985      0.99996  00015230
*                                                                 00015240
*                                                                 00015250
 57    FUNCTION   RN1,D19     PROB SYSTEM MA PMI/MA PMI           00015260
0.064501     0.164002     0.281203     0.441304     0.543806     0.594507 00015270
0.597008     0.651709     0.652710     0.671911     0.725112     0.727113 00015280
0.740414     0.792115     0.805916     0.815317     0.817818     0.974919 00015290
0.999920                                                          00015300
*                                                                 00015310
*                                                                 00015320
 58    FUNCTION   FN46,L296   PROB ELEMENT MA  P M I  /SYS MA  P M I 00015330
0101 000  0102 000  0103 000  0104 000  0105 000  0106 000          00015340
0107 076  0108 000  0109 091  0110 091  0111 000  0112 038          00015350
0113 015  0114 015  0115 015  0116 000  0117 000  0118 000          00015360
0119 036  0120 618  0201 000  0202 000  0203 050  0204 040          00015370
0205 099  0206 000  0207 000  0208 050  0209 000  0210 000          00015380
0211 079  0212 000  0213 000  0214 000  0215 000  0216 000          00015390
0217 000  0218 000  0219 074  0220 074  0221 149  0222 099          00015400
0223 050  0224 238  0301 042  0302 000  0303 000  0304 000          00015410
0305 021  0306 000  0307 021  0308 000  0309 042  0310 042          00015420
0311 084  0312 033  0313 714  0401 138  0402 000  0403 000          00015430
0404 000  0405 000  0406 000  0407 000  0408 043  0409 031          00015440
0410 142  0411 000  0412 000  0413 000  0414 000  0415 092          00015450
0416 000  0417 000  0418 000  0419 021  0420 021  0421 021          00015460
0422 021  0423 021  0424 021  0425 000  0426 000  0427 000          00015470
0428 017  0429 017  0430 017  0431 017  0432 363  0501 000          00015480
0502 000  0503 000  0504 000  0505 000  0506 000  0507 000          00015490
0508 000  0601 106  0602 000  0603 000  0604 096  0605 000          00015500
0606 000  0607 000  0608 000  0609 000  0610 000  0611 000          00015510
0612 063  0613 000  0614 000  0615 000  0616 010  0617 000          00015520
0618 000  0619 000  0620 063  0621 106  0622 063  0623 495          00015530
0701 000  0702 000  0703 000  0704 097  0705 000  0706 330          00015540
0707 019  0708 000  0709 000  0710 000  0711 000  0712 437          00015550
0713 000  0714 078  0715 000  0716 000  0717 019  0718 000          00015560
0719 000  0720 019  0721 000  0722 000  0801 999  0802 000          00015570
0803 000  0804 000  0805 000  0901 000  0902 000  0903 000          00015580
0904 018  0905 000  0906 000  0907 000  0908 000  0909 000          00015590
0910 144  0911 523  0912 000  0913 000  0914 000  0915 027          00015600
0916 288  1001 000  1002 000  1003 000  1004 000  1005 000          00015610
1006 000  1007 999  1008 000  1009 000  1010 000  1011 000          00015620
1101 000  1102 000  1103 000  1104 000  1105 000  1106 000          00015630
1107 000  1108 256  1109 000  1110 000  1111 000  1112 000          00015640
1113 744  1201 555  1202 185  1203 213  1204 046  1205 000          00015650
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1301	000	1302	000	1303	000	1304	000	1305	500	1306	000	00015660
1307	500	1308	000	1401	185	1402	000	1403	000	1404	000	00015670
1405	185	1406	444	1407	000	1408	000	1409	185	1410	000	00015680
1411	000	1501	000	1502	000	1503	019	1504	095	1505	000	00015690
1506	000	1507	000	1508	000	1509	000	1510	095	1511	000	00015700
1512	000	1513	000	1514	000	1515	048	1516	095	1517	000	00015710
1518	019	1519	000	1520	000	1521	019	1522	048	1523	000	00015720
1524	000	1525	000	1526	562	1601	000	1602	536	1603	000	00015730
1604	179	1605	000	1606	071	1607	000	1608	000	1609	071	00015740
1610	071	1611	000	1612	000	1613	071	1614	000	1615	000	00015750
1701	000	1702	000	1703	000	1704	000	1705	000	1706	000	00015760
1707	000	1708	000	1709	000	1710	105	1711	105	1712	000	00015770
1713	000	1714	789	1801	000	1802	000	1803	000	1804	999	00015780
1805	000	1806	000	1807	000	1901	107	1902	197	1903	000	00015790
1904	323	1905	000	1906	000	1907	031	1908	000	1909	000	00015800
1910	024	1911	024	1912	000	1913	000	1914	000	1915	295	00015810
2001	588	2002	137	2003	000	2004	000	2005	000	2006	039	00015820
2007	235	2008	000									00015830

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70	FUNCTION	FN46,L296	SKILL CODE-	WORK CENTER-	REMOVE & REPLACE	00015840
0101	0000030102	0002030103	0007030104	0007030105	0000000106	00000000015850
0107	0000000108	0000070109	0007030110	0007030111	0000000112	00000000015860
0113	0000030114	0000030115	0000000116	0000000117	0007050118	00000000015870
0119	0000030120	0007030201	0000030202	0003020203	0000000204	00000300015880
0205	0003020206	0000030207	0002030208	0002030209	0000030210	00010300015890
0211	0005030212	0002030213	0000050214	0005030215	0002050216	00020300015900
0217	0000030218	0000030219	0002030220	0000030221	0000030222	00000300015910
0223	0010030224	0002030301	0000030302	0000040303	0000030304	00000300015920
0305	0000030306	0000030307	0000030308	0000030309	0000030310	00030200015930
0311	0002030312	0000030313	0010030401	0001030402	0000000403	00000000015940
0404	0001030405	0000030406	0000030407	0001030408	0000000409	00000300015950
0410	0006030411	0006030412	0000030413	0001030414	0000030415	00000300015960
0416	0000030417	0000030418	0000030419	0002030420	0002030421	00020300015970
0422	0002030423	0002030424	0002030425	0007030426	0005030427	00020300015980
0428	0007030429	0007030430	0007030431	0007030432	0002030501	00020300015990
0502	0000030503	0002030504	0000030505	0000020506	0002030507	00020300016000
0508	0005030601	0006030602	0006030603	0002030604	0009030605	00000300016010
0606	0000030607	0000030608	0001030609	0000030610	0000030611	00000300016020
0612	0000030613	0000030614	0009030615	0000030616	0000030617	00000300016030
0618	0008030619	0002080620	0002030621	0007030622	0006030623	00060300016040
0701	0009030702	0009030703	0000030704	0009030705	0002030706	00020300016050
0707	0000000708	0003090709	0009030710	0003090711	0009030712	00030900016060
0713	0005030714	0005030715	0000020716	0000030717	0000030718	00000300016070
0719	0000030720	0000030721	0000030722	0003090801	0008020802	00080300016080
0803	0002030804	0009030805	0007030901	0002080902	0000080903	00000800016090
0904	0000030905	0003080906	0008030907	0000080908	0003080909	00030800016100
0910	0002030911	0003080912	0003080913	0003080914	0000020915	00000800016110
0916	0008031001	0000001002	0001031003	0000031004	0000001005	00010300016120
1006	0000001007	0003041008	0006031009	0000031010	0000001011	00010300016130
1101	0005031102	0000001103	0005031104	0002031105	0005031106	00080300016140
1107	0005081108	0002081109	0006031110	0000031111	0000031112	00000300016150
1113	0005031201	0002031202	0000031203	0003081204	0001031205	00020300016160
1301	0002031302	0000031303	0000031304	0000031305	0000081306	00080400016170
1307	0008041308	0007081401	0000031402	0003081403	0001031404	00080300016180
1405	0000031406	0000031407	0000031408	0000031409	0008031410	00000300016190
1411	0002031501	0008031502	0006081503	0009031504	0002031505	00000400016200
1506	0000041507	0000041508	0000081509	0000081510	0003081511	00080400016210
1512	0001041513	0004031514	0000081515	0000081516	0000071517	00030800016220
1518	0008031519	0009081520	0008031521	0003021522	0001031523	00080300016230
1524	0003081525	0004081526	0003081601	0000041602	0001041603	00020400016240
1604	0000041605	0000041606	0000001607	0000041608	0000041609	00000400016250
1610	0003081611	0000041612	0000041613	0000041614	0000041615	00010400016260
1701	0008031702	0000041703	0001041704	0000041705	0000041706	00000000016270
1707	0003041708	0000041709	0008041710	0008041711	0000011712	00000400016280
1713	0000041714	0008041801	0000041802	0000041803	0008041804	00000400016290
1805	0003041806	0000041807	0000041901	0000031902	0009031903	00090300016300
1904	0003091905	0003081906	0008031907	0001091908	0003091909	00030900016310

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1910  0003091911  0003091912  0000001913  0009031914  0009031915  000309000016320
2001  0009032002  0009032003  0008032004  0000032005  0000032006  000902000016330
0007  0007092008  000309                                                00016340
 71    FUNCTION   P1,E3        VARIABLE SORT FOR WORK CENTERS, R&R      00016350
1      V270  2    V269  3      V268                                     00016360
       INITIAL    XH78,1586                                            00016370
       INITIAL    MH11(1-4,5),1      MON  ROW=LAUNCH,DATA=PRIORITY     00016380
       INITIAL    MH13(1-5,5),1      ROW=LAUNCH,DATA=PRIORITY          00016400
       INITIAL    MH14(1-4,5),1      THU  ROW=LAUNCH,DATA=PRIORITY     00016410
       INITIAL    MH15(1-4,5),1      FRI  ROW=LAUNCH,DATA=PRIORITY     00016420
       INITIAL    MH11(1,10),1       MON  NO. OF A/C LAUNCH1           00016430
       INITIAL    MH13(1,10),1       WED  NO. OF A/C LAUNCH1           00016450
       INITIAL    MH14(1,10),1       THU  NO. OF A/C LAUNCH1           00016460
       INITIAL    MH15(1,10),1       FRI  NO. OF A/C LAUNCH1           00016470
       INITIAL    MH11(2,10),1       MON  NO. OF A/C LAUNCH2           00016480
       INITIAL    MH13(2,10),1       WED  NO. OF A/C LAUNCH2           00016500
       INITIAL    MH14(2,10),1       THU  NO. OF A/C LAUNCH2           00016510
       INITIAL    MH15(2,10),1       FRI  NO. OF A/C LAUNCH2           00016520
       INITIAL    MH11(3,10),2       MON  NO. OF A/C LAUNCH3           00016530
       INITIAL    MH13(3,10),1       WED  NO. OF A/C LAUNCH3           00016550
       INITIAL    MH14(3,10),2       THU  NO. OF A/C LUANCH3           00016560
       INITIAL    MH15(3,10),1       FRI  NO. OF A/C LAUNCH3           00016570
       INITIAL    MH11(4,10),1       MON  NO. OF A/C LAUNCH4           00016580
       INITIAL    MH13(4,10),2       WED  NO. OF A/C LAUNCH4           00016600
       INITIAL    MH14(4,10),1       THU  NO. OF A/C LAUNCH4           00016610
       INITIAL    MH15(4,10),1       FRI  NO. OF A/C LAUNCH4           00016620
       INITIAL    MH13(5,10),1       WED  NO. OF A/C LAUNCH5           00016625
       INITIAL    MH11(1,11),88      MON  TIME FROM 00:12 TO 1ST LAUNCH 00016630
       INITIAL    MH13(1,11),88      WED  TIME FROM 00:12 TO 1ST LAUNCH 00016650
       INITIAL    MH14(1,11),88      THU  TIME FROM 00:12 TO 1ST LAUNCH 00016660
       INITIAL    MH15(1,11),88      FRI  TIME FROM 00:12 TO 1ST LAUNCH 00016670
       INITIAL    MH11(2,11),5       MON  TIME BETWEEN LAUNCH 1&2       00016680
       INITIAL    MH13(2,11),1       WED  TIME BETWEEN LAUNCH 1&2       00016700
       INITIAL    MH14(2,11),5       THU  TIME BETWEEN LAUNCH 1&2       00016710
       INITIAL    MH15(2,11),5       FRI  TIME BETWEEN LAUNCH 1&2       00016720
       INITIAL    MH11(3,11),20      MON  TIME BETWEEN LAUNCH 2&3       00016730
       INITIAL    MH13(3,11),4       WED  TIME BETWEEN LAUNCH 2&3       00016750
       INITIAL    MH14(3,11),20      THU  TIME BETWEEN LAUNCH 2&3       00016760
       INITIAL    MH15(3,11),20      FRI  TIME BETWEEN LAUNCH 2&3       00016770
       INITIAL    MH11(4,11),20      MON  TIME BETWEEN LAUNCH 3&4       00016780
       INITIAL    MH13(4,11),20      WED  TIME BETWEEN LAUNCH 3&4       00016800
       INITIAL    MH14(4,11),20      THU  TIME BETWEEN LAUNCH 3&4       00016810
       INITIAL    MH15(4,11),20      FRI  TIME BETWEEN LAUNCH 3&4       00016820
       INITIAL    MH13(5,11),20      WED  TIME BETWEEN LAUNCH 4&5       00016825
       INITIAL    MH11(2,12),107     MON  TIME BETWEEN LAUNCH 4&00:12   00016830
       INITIAL    MH13(2,12),107     WED  TIME BETWEEN LAUNCH 4&00:12   00016850
       INITIAL    MH14(2,12),107     THU  TIME BETWEEN LAUNCH 3&00:12   00016860
       INITIAL    MH15(2,12),107     FRI  TIME BETWEEN LAUNCH 4&00:12   00016870
       INITIAL    MH11(1,12),4       MON  NO. OF LAUNCHES PER DAY       00016880
       INITIAL    MH13(1,12),5       WED  NO. OF LAUNCHES               00016900
       INITIAL    MH14(1,12),4       THU  NO. OF LAUNCHES PER DAY       00016910
       INITIAL    MH15(1,12),4       FRI  NO. OF LAUNCHES PER DAY       00016920
       INITIAL    MH1(1,13),480     NON FLYING HOURS WEEKEND            00016930
       INITIAL    MH1(1,14),1200    FLYING HOURS WEEKDAYS               00016940
       INITIAL    MH1(3,12),5       SLACK TIME                          00016950
       INITIAL    MH1(8,12),14       TIME FROM CALL TO LAUNCH           00016960
       INITIAL    MH1(6,13),0       TIME TO PERFORM AIRCREW INSPECTION  00016970
       INITIAL    MH1(7,13),5       LAUNCH TIME TO REPLACE ABORTS       00016980
       INITIAL    MH1(1,17),999     PERCENT IN-FLT ABORTS REPLACED      00016990
       INITIAL    MH1(1,15),1       NO STANDBY A/C BY MISSION TYPE      00017000
       INITIAL    MH1(1,18),18       FLT DURATION FOR ABORT REPLACEMENTS00017010
       INITIAL    MH1(1,16),2       NO.PRELAUNCH EVENTS                 00017020
       INITIAL    MH1(1,21),5       TIME LAUNCH WINDOW STAYS OPEN       00017030
       INITIAL    MH1(1,15),1       STANDBY AIRCRAFT MISSION 1          00017040
       INITIAL    MH1(2,16),2           PRELAUNCH EVENTS                00017050
       INITIAL    MH1(6,17),1200    5 DAY FLYING PERIOD                 00017060
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        INITIAL    MH1(6,18),480      2 DAY NONFLYING PERIOD                    00017070
        INITIAL    MX3(1,1),80        FIRST SHIFT DURATION = 8 HRS              00017080
        INITIAL    MX3(2,1),0         SECOND SHIFT DURATION = 0 HRS             00017090
        INITIAL    MX3(1,4),83        START OFFSET SHIFT 1 PERIOD 1             00017100
        INITIAL    MX3(3,2),80        WORKING INTERVAL DAILY ********           00017110
        INITIAL    MX3(3,3),160       NON WORKING INTERVAL DAILY *****          00017120
        INITIAL    MX3(3,4),85        START WORK OFFSET **************          00017130
        INITIAL    MX3(2,2),1200      WORKING INTERVAL CONTROL WEEKLY***        00017140
        INITIAL    MX3(2,3),480       NONWORKING INTERVAL WEEKLY *******        00017150
        INITIAL    MX1(2,1),20        PMP MANPOWER PRIMARY W.C.(1)              00017160
        INITIAL    MX1(2,3),10        PMP MANPOWER SECONDARY W.C.(3)            00017170
        INITIAL    MX1(3,1),160       PMP HOURS PRIMARY W.C.(1)                 00017180
        INITIAL    MX1(3,3),100       PMP HOURS SECONDARY W.C.(3)               00017190
        INITIAL    MX1(1,8),160       PMP LOOK PHASE EMT                        00017200
        INITIAL    MX1(10,1),10       PMI MANPOWER PRIMARY W.C.(1)              00017210
        INITIAL    MX1(10,3),10       PMI MANPOWER SECONDARY W.C.(3)            00017220
        INITIAL    MX1(11,1),60       PMI HOURS PRIMARY W.C.(1)                 00017230
        INITIAL    MX1(11,3),60       PMI HOURS SECONDARY W.C.(3)               00017240
        INITIAL    MX1(1,9),60        PMI LOOK PHASE EMT                        00017250
        INITIAL    MX1(1,2),83       FIRST DAILY AT 8:30 **********             00017260
        INITIAL    MX1(1,3),240       TIME BETWEEN DAILIES                      00017270
        INITIAL    MX1(4,7),1         NORS/CANNIB. ELEMENT MODE                 00017280
        INITIAL    MX1(1,8),720      MINIMUM ELAPSED DOWNTIME PMP = 72 HRS00017290
        INITIAL    MX1(1,9),280      MINIMUM ELAPSED DOWNTIME PMI = 28 HRS00017300
        INITIAL    MX1(1,10),3        DAYS BETWEEN DAILIES NON FLYING           00017310
        INITIAL    MX1(4,10),15      DEFERRED MA'S   MAXIMUM NO. ALLOWED       00017320
        INITIAL    MX1(5,9),1         SIMULATE FACTOR                           00017430
********** TBO TIMES                                                           00017431
        INITIAL    MH6(26,1-2),800/MH6(26,3-8),2500/MH6(26,9-12),1600        00017440
        INITIAL    MH6(26,13),625/MH6(26,14-16),1200/MH6(26,17),2400          00017450
        INITIAL    MH6(26,18-21),800                                         00017460
********** TBO ELEMENTS                                                        00017461
        INITIAL    MH6(27,1),401/MH6(27,2),414/MH6(27,3),419                 00017470
        INITIAL    MH6(27,4),420/MH6(27,5),421/MH6(27,6),422                 00017480
        INITIAL    MH6(27,7),423/MH6(27,8),424/MH6(27,9),428                 00017490
        INITIAL    MH6(27,10),429/MH6(27,11),430/MH6(27,12),431              00017500
        INITIAL    MH6(27,13),604/MH6(27,14),609/MH6(27,15),610              00017510
        INITIAL    MH6(27,16),1005/MH6(27,17),1405/MH6(27,18),1908           00017520
        INITIAL    MH6(27,19),1909/MH6(27,20),1910/MH6(27,21),1911           00017530
********** TBO DISPOSITION  4=CONDEMNED,6=OVERHAULED                          00017531
        INITIAL    MH6(28,1-21),4                                            00017540
        INITIAL    MH1(1,22),000       % MISSION AC WITH ORDNANCE             00017550
        INITIAL    MH1(6,14),30000      FLYING HOUR GOAL                     00017560
        INITIAL    X195,99999                                                00017570
        INITIAL    X196,00                                                   00017580
        INITIAL    X197,21            NO. TBO ITEMS                          00017590
        INITIAL    X191,9            NO. AIRCRAFT PER COMPANY                00017600
        INITIAL    X189,1000          PMP INTERVAL                           00017610
        INITIAL    X193,480           NO.OF "WEEKEND" NON-WORKING HOURS      00017620
        INITIAL    X194,0             OVERTIME CRITERIA (NO. AIRCRAFT)       00017630
        INITIAL    X190,250           PMI INTERVAL                           00017640
        INITIAL    X192,5             NO. OF WORKING DAYS/WEEK               00017650
        INITIAL    X1526,720                                                 00017660
        INITIAL    X1527,-720                                                00017670
        INITIAL    MX1(5,1),120960       EIGHTEEN MONTHS                     00017680
        INITIAL    MX1(4,6),99999     MAXIMUM FLYING HOURS                   00017690
        INITIAL    X199,135           TIME OF LAST DAILY, 13:30              00017700
        INITIAL    X200,190           HRS CANNOT PERFORM DAILY               00017710
        INITIAL    X1601,165          TIME OF END OF 1ST SHIFT               00017720
        INITIAL    MX1(4,8),5          TIME TO GET PART                      00017721
        INITIAL    X1602,0     % INCREASE SUPPLY DELAY (0=DUMMY)             00017722
*                                                                           00017730
* MISSION GENERATOR ROUTINE                                                 00017740
*                                                                           00017750
*   SCHEDULED MISSION SUBROUTINE                                            00017760
*                                                                           00017770
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*                                                                                                    00017780
ZZA      GENERATE    ,,2,1,50,25,F                                                                   00017790
         SPLIT       1,DLCA,,25                                                                      00017800
         SPLIT       1,EDSIM,,65                                                  1.27               00017801
         SPLIT       1,MPCA,,25                                                                      00017810
         SPLIT       1,FTA,,25                                                                       00017820
         SPLIT       1,DCRA,,25                                                                      00017830
         SPLIT       1,DATA,,25                                                                      00017840
         SPLIT       1,HLDY1,,25                                                    NORA             00017841
         ASSIGN      13,11                                                                           00017850
SMGF     ASSIGN      9+,K1                                                                           00017860
SMGG     ADVANCE     MH*P13(*9,11)          DAILY LAUNCH SCHEDULE CHANGE                             00017870
         TEST E      P9,K1,SMGT                                                                      00017880
         SPLIT       1,SACA,,25                                                                      00017890
SMGT     ASSIGN      2,5                                                                             00017900
SMGB     TEST GE     MH*P13(*9,V1),K1,SMGE  DAILY LAUNCH SCHEDULE CHANGE                             00017910
         ASSIGN      3,MH*P13(*9,V1)        DAILY LAUNCH SCHEDULE CHANGE                             00017920
         ASSIGN      4,MH*P13(*9,*2)        DAILY LAUNCH SCHEDULE CHANGE                             00017930
         LOOP        2,SMGC                                                                          00017940
SMGD     SPLIT       1,SMGH,,25                                                                      00017950
SMGE     GATE LR     2,SMGQ                                                                          00017960
         TEST E      P9,MH*P13(1,12),SMGF   DAILY LAUNCH SCHEDULE CHANGE                             00017970
         ADVANCE     MH*P13(2,12)           DAILY LAUNCH SCHEDULE CHANGE                             00017980
         ASSIGN      9,K1                                                                            00017990
SIK6     GATE LR     1                    DAILY LAUNCH SCHEDULE CHANGE                               00018000
         ASSIGN      13,V267            FOR DAY OF WEEK LAUNCH MATRIX                               00018010
         TEST NE     MH*P13(1,12),0,SIK5  IS THERE FLYING TODAY?                                     00018011
         TRANSFER    ,SMGG                                                                           00018020
SMGC     SPLIT       1,SMGH,,25                                                                      00018030
         TRANSFER    ,SMGB                                                                           00018040
SMGH     GATE LR     V8,SMGQ                                                                         00018050
         GATE LR     1,SMGQ                                                                          00018060
         GATE LR     2,SMGQ                                                                          00018070
         ASSIGN      2+,K1                                                                           00018080
         ASSIGN      6,C1                                                                            00018090
         SPLIT       1,SMGR,,25                                                                      00018100
         SAVEVALUE   P4+,P3,H                                                                        00018110
SMGN     ALTER       16,ALL,7,P6,15,1                                                                00018120
         ALTER       16,ALL,8,*4,15,1                                                                00018130
SMGK     UNLINK      1,PLAB,1,11,P4,SMGJ                                                             00018140
         LOOP        3,SMGK                                                                          00018150
SMGQ     TERMINATE                                                                                   00018160
SMGJ     ASSIGN      1+,K1                                                                           00018170
         TEST E      P1,K6,SMGL                                                                      00018180
         TEST E      P11,K0,SMGM                                                                     00018190
         MARK        7                                                                               00018200
         ASSIGN      11,1                                                                            00018210
         ASSIGN      8,MH1(3,12)                                                                     00018220
SMGM     ADVANCE     1                                                                               00018230
         TEST G      MP7,P8,SMGP                                                                     00018240
         UNLINK      4,ARM37,1,,,ARM39                                                               00018250
         SPLIT       1,ARM40,,60                                                                     00018260
         ASSIGN      3-,K1                                                                           00018270
ARM39    SAVEVALUE   V5+,P3,H                                                                        00018280
         TRANSFER    ,SMGQ                                                                           00018290
SMGL     ASSIGN      4,FN1                                                                           00018300
         TRANSFER    ,SMGK                                                                           00018310
SMGP     ASSIGN      1,K0                                                                            00018320
         ASSIGN      4,MH*P13(*9,*2)        DAILY LAUNCH SCHEDULE CHANGE                             00018330
         TRANSFER    ,SMGN                                                                           00018340
SMGR     ADVANCE     MH1(8,12)                                                                       00018350
         BUFFER                                                                                      00018360
         LOGICS      V6                                                                              00018370
         LOGICS      19                                                                              00018380
         ADVANCE     MH1(P4,21)                                                                      00018390
         BUFFER                                                                                      00018400
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29(1)

29(2)

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          LOGICR     V6                                                    00018410
          LOGICR     19                                                    00018420
          TRANSFER   ,SMGQ                                                 00018430
29(3)  SIK5 ADVANCE  240      DELAY ONE DAY IF NO LAUNCHES TODAY           00018440
          TRANSFER   ,SIK6     RETURN TO LAUNCH GENERATOR NEXT DAY         00018441
HLDY1     ADVANCE    238                                          NORA     00018442
HLDY6     TEST G     RN8,52,HLDY2                                 NORA     00018443
HLDY5     ADVANCE    240                                          NORA     00018444
          TRANSFER   ,HLDY6                                       NORA     00018445
HLDY2     UNLINK     1,NORA1,ALL                                  NORA     00018446
          TEST NE    V266,5,HLDY8                                 NORA     00018447
          TEST NE    V266,0,HLDY9                                 NORA     00018448
          ASSIGN     1,240                                        NORA     00018449
HLDYA     ADVANCE    P1                                           NORA     00018450
HLDY7     UNLINK     60,NORA2,ALL                                 NORA     00018451
          TRANSFER   ,HLDY6                                       NORA     00018452
HLDY8     ASSIGN     1,720                                        NORA     00018453
          TRANSFER   ,HLDYA                                       NORA     00018454
HLDY9     ASSIGN     1,480                                        NORA     00018455
          TRANSFER   ,HLDYA                                       NORA     00018456
NORA1     MARK                                                    NORA     00018457
          LINK       60,FIFO                                      NORA     00018458
NORA2     SAVEVALUE  1750+,M1                                     NORA     00018459
          LINK       1,FIFO                                       NORA     00018460
*                                                                           00018470
*   FLYING TERMINATION SUBROUTINE                                           00018480
*                                                                           00018490
FTA       PRIORITY   80                                                    00018500
          SPLIT      1,FTH,,25                                             00018510
          SPLIT      4,FTB,2,25                                            00018520
FTB       ASSIGN     3,MH1(*2,14)                                          00018530
          TEST GE    P3,K1,SMGQ                                            00018540
          ASSIGN     4,MH1(*2,13)                                          00018550
          ADVANCE    V9                                                    00018560
FTC       LOGICS     1                                                     00018570
          SPLIT      1,FTF,,25                                             00018580
          ADVANCE    P4                                                    00018590
          UNLINK     2,SMGQ,1                                              00018600
          UNLINK     2,FTD,1,,,FTE                                         00018610
          TRANSFER   ,FTG                                                  00018620
FTE       LOGICR     1                                                     00018630
FTG       ADVANCE    P3                                                    00018640
          TRANSFER   ,FTC                                                  00018650
FTF       LINK       2,FIFO                                                00018660
FTD       TRANSFER   ,FTF                                                  00018670
FTH       ASSIGN     1,MX1(4,6)                                            00018680
          TEST NE    P1,K0,SMGQ                                            00018690
          SPLIT      1,FTR,,25                                             00018700
FTJ       TEST GE    XH11,P1,FTK                                           00018710
          LOGICS     2                                                     00018720
          LOGICS     1                                                     00018730
          TERMINATE                                                        00018740
FTK       ADVANCE    20                                                    00018750
          TRANSFER   ,FTJ                                                  00018760
FTR       SPLIT      1,FTL,,25                                             00018770
          SPLIT      1,FTT,,25                                             00018780
          SPLIT      4,FTX,11,25                                           00018790
FTX       ASSIGN     9,MH1(V2,18)                                          00018800
          TEST GE    P9,K1,SMGQ                                            00018810
          ASSIGN     1,V3                                                  00018820
          ASSIGN     6,MH1(V2,17)                                          00018830
          LOGICS     V7                                                    00018840
          ADVANCE    MH1(V2,16)                                            00018850
FTZ       LOGICR     V7                                                    00018860
          ADVANCE    P6                                                    00018870
          LOGICS     V7                                                    00018880
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         ADVANCE    P9                                                    00018890
         GATE LR    *1,SMGQ                                               00018900
         TRANSFER   ,FTZ                                                  00018910
FTL      SPLIT      4,FTP,11,25                                           00018920
FTP      ASSIGN     9,MH1(V2,14)                                          00018930
         TEST GE    P9,K1,SMGQ                                            00018940
         ASSIGN     1,V3                                                  00018950
         ASSIGN     8,V4                                                  00018960
FTN      TEST GE    XH*8,P9,FTM                                           00018970
         LOGICS     V7                                                    00018980
         LOGICS     *1                                                    00018990
         TERMINATE                                                        00019000
FTM      ADVANCE    10                                                    00019010
         TRANSFER   ,FTN                                                  00019020
FTT      SPLIT      4,FTS,11,25                                           00019030
FTS      ASSIGN     9,MH1(V2,15)                                          00019040
         TEST GE    P9,K1,SMGQ                                            00019050
         LOGICS     V7                                                    00019060
         ADVANCE    P9                                                    00019070
         LOGICR     V7                                                    00019080
         TERMINATE                                                        00019090
*                                                                         00019100
*                                                                         00019110
*                                                                         00019120
*                                                                         00019130
* AIRCRAFT ROUTINE                                                        00019140
*                                                                         00019150
*                                                                         00019160
*        AIRCRAFT COMPLEMENT SUBROUTINE                                   00019170
*                                                                         00019180
*                                                                         00019190
*                                                                         00019200
*                                                                         00019210
*                                                                         00019220
ZZB      GENERATE   ,,1,X191,90,60,F  GENERAL                             00019230
         ASSIGN     47,V10                                                00019240
         ASSIGN     11,1                                                  00019250
AAA      JOIN       25                                                    00019260
         ASSIGN     41,V11                                                00019270
         ASSIGN     40,V231      INITIALIZE AIRFRAME HOURS                00019280
*                                                                         00019290
30       ASSIGN     46,X1527     FLAG AIRCRAFT FOR DAILY                  00019300
         ASSIGN     48,X1527     FLAG AIRCRAFT FOR DAILY                  00019310
*                                                                         00019320
*                                                                         00019330
*                                                                         00019340
         ASSIGN     14,N$AAA                                              00019350
         JOIN       13                                            1.27    00019351
         MSAVEVALUE 6,25,P14,P40,H                                        00019360
31       SAVEVALUE  17+,K1,H                                              00019370
         ASSIGN     15,X197      |TBD ITEMS TO BE INITIALIZED             00019380
ARM16    MSAVEVALUE 6,P14,P15,V146,H                                      00019390
         LOOP       15,ARM16                                              00019400
         JOIN       16                                                    00019410
         JOIN       23                                                    00019420
AAC      ASSIGN     15,1                                                  00019430
         TEST NE    P35,999,HLH2       INSURES AGAINST A SECOND PMI       00019440
         TEST L     V147,V234,ARM17    GENERAL                            00019450
         TEST L     V11,V236,ARM17        TEST FOR CALENDAR PMP           00019460
         TEST L     V148,V235,ARM19    GENERAL                            00019470
HLH2     JOIN       29     THIS LOGIC IS VALID FOR                        00019480
         ASSIGN     35,K0                 ALL RUNS TO STOP EXTRA PMI'S     00019490
AAD      TEST NE    BV20,1,OLB                                            00019500
         LINK       1,FIFO                                                00019510
AAB      TEST NE    P26,K2,AAF                                            00019520
         ASSIGN     16,K0                                                 00019530
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AAF     PRIORITY    90                                          00019540
        TRANSFER    ,AAC                                        00019550
ARM17   TEST G      V238,FN4,HLH2                               00019560
        ASSIGN      15,K0                                       00019570
        JOIN        30                                          00019580
        ASSIGN      17,17                                       00019590
        SAVEVALUE   V169+,K1                                    00019600
        SAVEVALUE   V170+,K1                                    00019610
        SAVEVALUE   450+,K1                                     00019620
        SAVEVALUE   1050+,K1                                    00019630
        TRANSFER    ,ARM18                                      00019640
ARM19   TEST G      V238,FN4,HLH2                               00019650
        ASSIGN      15,K0                                       00019660
        JOIN        37                                          00019670
        ASSIGN      17,8                                        00019680
        SAVEVALUE   V165+,K1                                    00019690
        SAVEVALUE   V166+,K1                                    00019700
        SAVEVALUE   400+,K1                                     00019710
        SAVEVALUE   1000+,K1                                    00019720
        TRANSFER    ,ARM23                                      00019730
*                                                               00019740
*                                                               00019750
*         STANDBY AIRCRAFT SUBROUTINE                           00019760
*                                                               00019770
SACA    PRIORITY    70                                          00019780
        ASSIGN      4,K0                                        00019790
        SPLIT       4,SACB,4,25                                 00019800
SACB    ASSIGN      3,MH1(*4,15)                                00019810
        GATE LR     V8,SMGQ                                     00019820
        TEST GE     P3,K1,SMGQ                                  00019830
SACG    EXECUTE     SMGH                                        00019840
        ASSIGN      2,P4                                        00019850
SACE    ALTER       16,ALL,8,*4,15,1                            00019860
        GATE LR     1,SMGQ                                      00019870
        TEST E      BV3,K1,SMGQ                                 00019880
SACC    UNLINK      1,PLAA,1,,,SACD                             00019890
        LOOP        3,SACC                                      00019900
        TERMINATE                                               00019910
SACD    ASSIGN      1+,K1                                       00019920
        TEST GE     P1,K6,SACF                                  00019930
        ASSIGN      4,P2                                        00019940
        ASSIGN      1,K0                                        00019950
        ADVANCE     1                                           00019960
        TRANSFER    ,SACE                                       00019970
SACF    ASSIGN      4,FN1                                       00019980
        TRANSFER    ,SACC                                       00019990
SACH    ASSIGN      4,P8                                        00020000
        REMOVE      32                                          00020010
        ASSIGN      1,K0                                        00020020
        ASSIGN      3,1                                         00020030
        TRANSFER    ,SACG                                       00020040
ARM40   ASSIGN      8,K1                                        00020050
        TRANSFER    ,SACH                                       00020060
*                                                               00020070
*                                                               00020080
*                                                               00020090
*   AIRCRAFT MAINLINE SUBROUTINE                                00020100
*                                                               00020110
*                                                               00020120
*     PRELAUNCH LOOP                                            00020130
*                                                               00020140
PLAA    ASSIGN      16,1                                        00020150
PLAB    ASSIGN      15,2                                        00020160
        TEST E      P16,KJ,ARM41                                00020170
        SAVEVALUE   V151+,K1                                    00020180
        SAVEVALUE   225+,K1                                     00020190
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        SAVEVALUE   V152+,K1                                    00020200
        SAVEVALUE   825+,K1                                     00020210
ARM41   REMOVE      29                                          00020220
        JOIN        28                                          00020230
PLAT    ASSIGN      19,K0                                       00020240
        ASSIGN      17,MH1(*8,16)                               00020250
        TEST NE     P8,P11,PLAG                                 00020260
        ASSIGN      9,K1                                        00020270
PLAG    ASSIGN      1,MH1(*8,22)                                00020280
PLAX    TEST E      P17,K1,PLAC                                 00020290
        TRANSFER    .*1,PLAH,PLAC                               00020300
PLAC    TRANSFER    SBR,LIA,5                                   00020310
        TEST LE     V13,FN2,PLAK                                00020320
PLAH    LOOP        17,PLAX                                     00020330
PLAN    ASSIGN      17,5                                        00020340
        ENTER       1                                           00020350
        ADVANCE     MH1(6,13)                                   00020360
        TABULATE    3                                           00020370
        TEST LE     V13,FN2,PLAL                                00020380
PLAJ    TEST NE     P16,K1,PLAD                                 00020390
PLAF    ENTER       2                                           00020400
        GATE LS     V14                                         00020410
PLAQ    REMOVE      28                                          00020420
        MARK                                                    00020430
        UNLINK      3,TSTHA,ALL,12,P12                          00020440
        LEAVE       2                                           00020450
        GATE LR     V15,PLAM                                    00020460
        TRANSFER    ,FLTA                                       00020470
PLAM    LEAVE       1                                           00020480
        TRANSFER    ,AAB                                        00020490
PLAK    ASSIGN      19,P17                                      00020500
        REMOVE      28                                          00020510
        ASSIGN      18,PLAR                                     00020520
        TRANSFER    ,CMA                                        00020530
PLAL    ASSIGN      19,P17                                      00020540
        REMOVE      28                                          00020550
        ASSIGN      18,PLAS                                     00020560
        TRANSFER    ,CMA                                        00020570
PLAD    JOIN        27                                          00020580
        REMOVE      28                                          00020590
        ASSIGN      15,K37                                      00020600
        LINK        4,FIFO                                      00020610
PLAE    REMOVE      27                                          00020620
        ASSIGN      15,K2                                       00020630
        SPLIT       1,SACH,,60                                  00020640
        JOIN        28                                          00020650
        TRANSFER    ,PLAF                                       00020660
PLAR    JOIN        28                                          00020670
        TRANSFER    ,PLAH                                       00020680
PLAS    JOIN        28                                          00020690
        TRANSFER    ,PLAJ                                       00020700
ARM37   ASSIGN      16,K0                                       00020710
        SAVEVALUE   V151+,K1                                    00020720
        SAVEVALUE   V152+,K1                                    00020730
        SAVEVALUE   225+,K1                                     00020740
        SAVEVALUE   825+,K1                                     00020750
        TRANSFER    ,PLAN                                       00020760
*                                                               00020770
*                                                               00020780
*                                                               00020790
*                                                               00020800
*                                                               00020810
*                                                               00020820
*     FLIGHT LOOP                                               00020830
*                                                               00020840
FLTA    JOIN        26                                          00020850
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        FLTL    TABULATE    2                                                   00020860
                ENTER       V14                                                 00020870
                TEST LE     P8,K5,FLTE                                          00020880
                TEST LE     V13,FN3,FLTC                                        00020890
                SAVEVALUE   V16+,K1,H                                           00020900
(33)    FLTD    ADVANCE     FN4                                                 00020910
                ASSIGN      46,X1527    AIRCRAFT HAS FLOWN, FLAG FOR DAILY      00020920
                TEST G      P8,K0,ARM42                                         00020930
                SAVEVALUE   V153+,K1                                            00020940
                SAVEVALUE   250+,K1                                             00020950
                SAVEVALUE   V154+,K1                                            00020960
                SAVEVALUE   850+,K1                                             00020970
                SAVEVALUE   V155+,FN4       TABULATE FLIGHT TIME                00020980
                SAVEVALUE   275+,FN4        THESE LOGIC CHANGES                 00020990
                SAVEVALUE   V156+,FN4       ARE GOOD FOR ALL SUCCESSIVE         00021000
                SAVEVALUE   875+,FN4        RUNS                                00021010
                ASSIGN      40+,FN4          CORRECT ERROR IN ACCOUNTING P40    00021020
        FLTH    LEAVE       V14             THIS CHANGE IS GOOD FOR ALL RUNS    00021030
                ASSIGN      16,K0                                               00021040
                TEST LE     P8,K5,FLTK                                          00021050
        FLTG    SAVEVALUE   V17+,M1,H                                           00021060
                SAVEVALUE   11+,M1,H                                            00021070
                SAVEVALUE   7+,M1                                               00021080
                ASSIGN      11,P8                                               00021090
                LEAVE       1                                                   00021100
                PRIORITY    20,BUFFER                                           00021110
                PRIORITY    90                                                  00021120
                REMOVE      26                                                  00021130
                REMOVE      34                                                  00021140
                TEST G      P19,5,AAB                                           00021150
                ASSIGN      18,AAB                                              00021160
                TRANSFER    ,CMA                                                00021170
        ARM42   SAVEVALUE   V205+,K1                                            00021180
                SAVEVALUE   775+,K1                                             00021190
                SAVEVALUE   V207+,FN4       GENERALIZE ACCOUNTING OF            00021200
                SAVEVALUE   800+,FN4    TEST HOP FLIGHT HOURS                   00021210
                SAVEVALUE   V204+,K1                                            00021220
                SAVEVALUE   1375+,K1                                            00021230
                SAVEVALUE   V206+,FN4       THIS CHANGE IS GOOD FOR ALL         00021240
                SAVEVALUE   1400+,FN4   SUBSEQUENT RUNS                         00021250
                ASSIGN      40+,FN4             ACCOUNT FOR TEST HOPS ON P40    00021260
                TRANSFER    ,FLTH                                               00021270
        FLTC    TEST LE     V13,FN5,FLTJ                                        00021280
                ASSIGN      19,6                                                00021290
                TRANSFER    ,FLTD                                               00021300
        FLTJ    ASSIGN      19,7                                                00021310
                TRANSFER    .999,FLTF,FLTE                                      00021320
        FLTF    UNLINK      4,FLTB,1,8,P8                                       00021330
(34)    FLTE    ADVANCE     V18                                                 00021340
                ASSIGN      46,X1527    AIRCRAFT HAS FLOWN, FLAG FOR DAILY      00021350
                *                         FOLLOWING CHANGE GOOD FOR ALL RUNS    00021360
                TEST G      P8,K0,HLH3      ROUTE ABORTED TEST HOPS             00021370
                TEST L      V147,V234,HLH21 GENERAL-ROUTINE INSURES             00021380
                TEST L      V11,V236,HLH21                                      00021390
                TEST L      V148,V235,HLH21 AGAINST DOING AN                    00021400
                TRANSFER    ,HLH22              EXTRA PMI ON AN                 00021410
        HLH21   ASSIGN      35,999              ABORT,RIGHT AFTER A             00021420
        HLH22   SAVEVALUE   V208+,K1            PMI.GOOD FOR ALL RUNS.          00021430
                SAVEVALUE   V209+,K1                                            00021440
                SAVEVALUE   V210+,V18       GENERALIZE ACCOUNTING OF            00021450
                SAVEVALUE   V211+,V18       ABORTED FLIGHT TIME                 00021460
                SAVEVALUE   1450+,K1                                            00021470
                SAVEVALUE   1500+,K1    CHANGES ARE GOOD FOR                    00021480
                SAVEVALUE   1475+,V18   ALL SUBSEQUENT RUNS                     00021490
                SAVEVALUE   1398+,V18       ALL SUBSEQUENT RUNS                 00021500
                ASSIGN      40+,V18         ACCOUNT FOR ABORTED HRS ON A/C      00021510
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        TRANSFER    ,FLTH                CHANGES GOOD FOR ALL RUNS          00021520
HLH3    SAVEVALUE   198+,K1       # OF  ABORTED  TEST HOPS                 00021530
        ASSIGN      40+,V18              GENERALIZE                         00021540
        TEST L      V147,V234,HLH5       ACCOUNTING                         00021550
        TEST L      V11,V236,HLH5                                           00021560
        TEST L      V148,V235,HLH5       ON ABORTED                         00021570
        TRANSFER    ,FLTH                TEST HOPS                          00021580
HLH5    ASSIGN      35,K999                                                 00021590
        TRANSFER    ,FLTH                                                   00021600
FLTB    SPLIT       1,SACH,,60                                              00021610
        ADVANCE     MH1(7,13)                                               00021620
        ASSIGN      46,V237                                                 00021630
        ASSIGN      40+,MH1(7,13)                                           00021640
        MARK                                                                00021650
        ASSIGN      8+,K6                                                   00021660
        TRANSFER    ,FLTA                                                   00021670
TSTHP   ASSIGN      8,K0                                                    00021680
        GATE LR     1,AAB                                                   00021690
        JOIN        34                                                      00021700
        MARK        6                                                       00021710
        ENTER       1                                                       00021720
        GATE LS     19                                                      00021730
        SPLIT       1,TSTHB,,60                                             00021740
        LINK        3,FIFO                                                  00021750
TSTHB   TEST E      BV2,0,TSTHC                                             00021760
        ADVANCE     V19                                                     00021770
TSTHC   UNLINK      3,TSTHA,ALL                                             00021780
        TERMINATE                                                           00021790
TSTHA   MARK                                                                00021800
        TRANSFER    ,FLTL                                                   00021810
UNLK    TRANSFER    P,21                                                    00021820
FLTK    ASSIGN      8-,K6                                                   00021830
        TRANSFER    ,FLTG                                                   00021840
*                                                                           00021850
*                                                                           00021860
*     POST FLIGHT LOOP                                                      00021870
*                                                                           00021880
PFAG    TEST E      P19,K0,PFAF                                             00021890
PFAE    TEST E      BV2,K1,PFAA                                             00021900
        ASSIGN      17,K12                                                  00021910
        JOIN        28                                                      00021920
        ASSIGN      16,K2                                                   00021930
        TRANSFER    SBR,LIA,5                                               00021940
        REMOVE      28                                                      00021950
        TEST LE     V13,FN2,PFAD                                            00021960
PFAC    TRANSFER    ,AAB                                                    00021970
PFAF    ASSIGN      16,PFAE                                                 00021980
        TRANSFER    ,CMA                                                    00021990
PFAA    ASSIGN      16,AAB                                                  00022000
PFAB    ASSIGN      17,11                                                   00022010
        JOIN        35                                                      00022020
        TRANSFER    SBR,LIA,5                                               00022030
        REMOVE      35                                                      00022040
        TRANSFER    P,18                                                    00022050
PFAD    ASSIGN      19,12                                                   00022060
        ASSIGN      16,K0                                                   00022070
        ASSIGN      15,PFAC                                                 00022080
        TRANSFER    ,CMA                                                    00022090
*                                                                           00022100
*                                                                           00022110
*                                                                           00022120
*                                                                           00022130
* PREVENTIVE MAINTENANCE ROUTINE                                            00022140
*                                                                           00022150
*                                                                           00022160
*  DAILY INSPECTION SUBROUTINE                                              00022170
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*                                                                              00022180
 DLCA  PRIORITY   40                                                           00022190
       ASSIGN     2,MX1(1,3)                                                  00022200
       TEST GE    P2,K1,SMGO                                                  00022210
       ADVANCE    MX1(1,2)                                                    00022220
 ARM36 ASSIGN     3,X192                                                      00022230
*                                        CH-47C                              00022240
 DLCB  GATE LR    1,DLCC                                                      00022250
 DLCD  UNLINK     1,DLB,ALL                                                   00022260
       UNLINK     4,DLA,ALL                                                   00022270
       ASSIGN     14,K0                                                       00022280
 DLCE  ADVANCE    P2                                                          00022290
       LOOP       3,DLCB                                                      00022300
       ADVANCE    X193                                                        00022310
*          ON THIS CARD FOR OTHER THAN A 7 DAY WEEK USE ADVANCE 480           00022320
       TRANSFER   ,ARM36                                                      00022330
       TRANSFER   ,DLCB                                                       00022340
 DLCC  ASSIGN     14+,K1                                                      00022350
       TEST E     V21,K0,DLCE                                                 00022360
       TRANSFER   ,DLCD                                                       00022370
 DLA   ASSIGN     16,K0                                                       00022380
       REMOVE     27                                                          00022390
       LEAVE      1                                                           00022400
       ASSIGN     19,K0                                                       00022410
 DLB   TEST GE    V239,X1526,DLB2   TEST FOR DAILY                            00022420
       TEST G     BV11,K0,DLB2      TEST TO SEE IF DAILY CAN BE DONE          00022430
       MARK       46                                                          00022440
 35    MARK       48           MARK TIME OF LAST DAILY                        00022450
       ASSIGN     17,16                                                       00022460
       REMOVE     29                                                          00022470
       ASSIGN     16,K0                                                       00022480
       ASSIGN     15,2                                                        00022490
       TRANSFER   ,DLH                                                        00022500
 DLB2  LINK       1,FIFO                                                      00022510
 36    ASSIGN     17,K16                                                      00022520
       TABULATE   18    TIME DAILY PERFORMED                                 00022525
       TABULATE   19   NUMBER OF DEFERRED MA'S                               00022530
 37    TEST LE    P24,MX1(4,10),RLARA                                         00022540
       JOIN       33                                                          00022550
       TRANSFER   SBR,LIA,5                                                   00022560
 DLD   ADVANCE    K0                                                          00022570
       REMOVE     33                                                          00022580
       TEST GE    V148,V235,DLC   LOGIC CHANGE TO FLAG AIRCRAFT              00022590
       ASSIGN     35,999      THAT HAVE JUST HAD A PMI                        00022600
 DLC   TEST G     V13,FN2,AAB                                                 00022610
       ASSIGN     19,P17                                                      00022620
       ASSIGN     18,AAB                                                      00022630
       TRANSFER   ,CMA                                                        00022640
*                                                                             00022650
*                                                                             00022660
*   LINE MAINTENANCE SUBROUTINE                                               00022670
*                                                                             00022680
 LIA   QUEUE      P17                                                         00022690
       ASSIGN     22,V23                                                      00022700
       ASSIGN     2,V24                                                       00022710
       TEST NE    P22,K0,LMM                                                  00022720
       MARK                                                                   00022730
       ENTER      V26                                                         00022740
       QUEUE      V27                                                         00022750
 LMI   GATE LR    20,LMB                                                      00022760
 LMF   ASSIGN     3,V28                                                       00022770
       ASSIGN     4,K0                                                        00022780
 LMD   TEST GE    R*3,P22,LMG                                                 00022790
       DEPART     V27                                                         00022800
       DEPART     P17                                                         00022810
       ENTER      *3,P22                                                      00022820
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        ASSIGN      20,V25                                                  00022830
        ADVANCE     P20                                                     00022840
        TEST NE     P17,K2,ARM30                                            00022850
        TEST NE     P17,K16,ARM31                                           00022860
ARM32   LEAVE       *3,P22                                                  00022870
        LEAVE       V26                                                     00022880
        TABULATE    3                                                       00022890
        MSAVEVALUE  2+,P2,P17,V29                                           00022900
        SAVEVALUE   V30+,V29                                                00022910
        SAVEVALUE   20+,V29                                                 00022920
        UNLINK      V31,UNLK,ALL                                            00022930
        TRANSFER    P,5,1                                                   00022940
ARM30   SAVEVALUE   V157+,K1                                                00022950
        SAVEVALUE   300+,K1                                                 00022960
        SAVEVALUE   V158+,K1                                                00022970
        SAVEVALUE   900+,K1                                                 00022980
        SAVEVALUE   V159+,V191                                              00022990
        SAVEVALUE   325+,V191                                               00023000
        SAVEVALUE   V160+,V191                                              00023010
        SAVEVALUE   925+,V191                                               00023020
        TRANSFER    ,ARM32                                                  00023030
ARM31   SAVEVALUE   V161+,K1                                                00023040
        SAVEVALUE   350+,K1                                                 00023050
        SAVEVALUE   V162+,K1                                                00023060
        SAVEVALUE   950+,K1                                                 00023070
        SAVEVALUE   V163+,V191                                              00023080
        SAVEVALUE   375+,V191                                               00023090
        SAVEVALUE   V164+,V191                                              00023100
        SAVEVALUE   975+,V191                                               00023110
        TRANSFER    ,ARM32                                                  00023120
LMB     ASSIGN      3,V27                                                   00023130
        ASSIGN      4,1                                                     00023140
        TRANSFER    ,LMD                                                    00023150
LMG     ASSIGN      21,LME                                                  00023160
        ASSIGN      24,FN7                                                  00023170
        LINK        V31,P23                                                 00023180
LME     TEST E      P16,K0,LMI                                              00023190
        TEST NE     P8,K0,LMI                                               00023200
        TEST NE     P17,K1,LMP                                              00023210
        TEST G      M1,FN8,LMI                                              00023220
LMN     DEPART      V27                                                     00023230
        DEPART      P17                                                     00023240
LML     LEAVE       V26                                                     00023250
        REMOVE      28                                                      00023260
        TRANSFER    ,AAB                                                    00023270
LMM     DEPART      P17                                                     00023280
        TRANSFER    P,5,1                                                   00023290
LMP     TEST G      MP7,FN8,LMI                                             00023300
        TRANSFER    ,LMN                                                    00023310
*                                                                           00023320
*       PMP-PMI SUBROUTINE                                                  00023330
*                                                                           00023340
*                                                                           00023350
ARM18   TEST NE     MH6(1,1),0,PMCY   ON CONDITION                          00023360
        ASSIGN      12,X197                                                 00023370
ARM22   TEST G      V149,X189,ARM24   GENERAL                               00023380
        ASSIGN      47,0          ZERO TIME SINCE LAST CALENDAR             00023390
ARM21   LOOP        12,ARM22                                                00023400
PMCY    ADVANCE                                                             00023410
ARM23   PRIORITY    20,BUFFER                                               00023420
        ASSIGN      49,P40        ACFH AT PMI/PMP                           00023430
        MARK                                                                00023440
        ASSIGN      35,999                                                  00023450
        ASSIGN      26,K0                                                   00023460
        ASSIGN      15,2                                                    00023470
        ASSIGN      21,PMCH                                                 00023480
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        ASSIGN    23,FN7                                                00023490
        ASSIGN    2,K0                                                  00023500
        SPLIT     1,PMCF,,60                                            00023510
        QUEUE     P17                                                   00023520
        ENTER     V26                                                   00023530
        DEPART    P17                                                   00023540
        SPLIT     1,PMCG,,60                                            00023550
        SPLIT     1,PMCR,,60                                            00023560
PMCM    ASSEMBLE  13                                                    00023570
        PRIORITY  90                                                    00023580
        LEAVE     V26                                                   00023590
        TABULATE  3                                                     00023600
        REMOVE    30                                                    00023610
        REMOVE    37                                                    00023620
        TEST NE   P17,K17,PMCZ                                          00023630
        TEST E    P17,K8,ARM33                                          00023640
ARM33   SPLIT     1,REEG                                                00023650
        TEST LE   V13,FN2,HLH1      PUT IN LOGIC TO                     00023660
        ASSIGN    27,K0             DETECT FAILURES AT                  00023670
        TEST E    P24,K0,RLARA      PMI AND DO AWAY WITH TEST HOPS      00023680
        TRANSFER  ,AAB              AFTER PMI.GOOD FOR ALL RUNS         00023690
PMCAA   TEST LE   V13,FN2,PMCS                                          00023700
        TEST E    P24,K0,PMCT                                           00023710
        TRANSFER  ,ARRG                                                 00023720
HLH1    ASSIGN    19,P17            CHANGES TO ALLOW FOR                00023730
        ASSIGN    25,K1             UNSCHEDULED MAINTENANCE             00023740
        ASSIGN    27,K0             AT PMI,AND TO DO AWAY WITH TEST     00023750
        TRANSFER  ,CMA              HOPS.GOOD FOR ALL RUNS              00023760
PMCZ    SPLIT     1,REAA,,60                                            00023770
        TRANSFER  ,PMCAA                                                00023780
PMCS    ASSIGN    19,P17                                                00023790
        ASSIGN    25,K1                                                 00023800
        ASSIGN    27,K1                                                 00023810
        TRANSFER  ,CMA                                                  00023820
PMCT    ASSIGN    27,K1                                                 00023830
        TRANSFER  ,RLARA                                                00023840
PMCF    LINK      27,FIFO                                               00023850
PMCG    ADVANCE   MX1(1,V32)                                            00023860
        UNLINK    27,SMGQ,1,14,P14                                      00023870
        TRANSFER  ,PMCM                                                 00023880
PMCR    SPLIT     10,PMCU,2,60                                          00023890
PMCU    ASSIGN    3,MX1(V33,*2)                                         00023900
        TEST GE   P3,K1,PMCM                                            00023910
        ASSIGN    4,MX1(V34,*2)                                         00023920
        TEST E    P17,K8,ARM34                                          00023930
        SAVEVALUE V167+,V36                                             00023940
        SAVEVALUE V168+,V36                                             00023950
        SAVEVALUE 425+,V36                                              00023960
        SAVEVALUE 1025+,V36                                             00023970
PMCV    QUEUE     V27                                                   00023980
PMCH    GATE LR   20,PMCJ                                               00023990
        ASSIGN    7,V28                                                 00024000
        ASSIGN    20,V35                                                00024010
40      ASSIGN    55,PMCV           10.23.74                            00024020
        TEST G    P20,0,PMCN1       10.23.74                            00024030
        ASSIGN    8,1                                                   00024040
PMCK    TEST GE   R*7,P3,PMCL                                           00024050
PMCO    TEST LE   P4,P20,PMCN                                           00024060
PMCQ    DEPART    V27                                                   00024070
        ENTER     *7,P3                                                 00024080
        ADVANCE   P4                                                    00024090
        LEAVE     *7,P3                                                 00024100
        UNLINK    P7,UNLK,ALL                                           00024110
        MSAVEVALUE 2+,P2,P17,V36                                        00024120
        SAVEVALUE V37+,V36                                              00024130
        SAVEVALUE 32+,V36                                               00024140
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        TEST E      P26,K0,PMCP                                          00024150
        TRANSFER    ,PMCM                                                00024160
ARM34   TEST L      P17,K17,PMCV                                         00024170
        SAVEVALUE   V171+,V36                                            00024180
        SAVEVALUE   V172+,V36                                            00024190
        SAVEVALUE   475+,V36                                             00024200
        SAVEVALUE   1075+,V36                                            00024210
        TRANSFER    ,PMCV                                                00024220
PMCJ    ASSIGN      7,V27                                                00024230
        ASSIGN      8,K0                                                 00024240
        ASSIGN      20,V38                                               00024250
        TRANSFER    ,PMCK                                                00024260
PMCN    ASSIGN      22,V39                                               00024270
        ASSIGN      4,P20                                                00024280
        ASSIGN      26,K1                                                00024290
        TEST E      P4,K0,PMCQ                                           00024300
        DEPART      V27                                                  00024310
PMCP    ASSIGN      4,P22                                                00024320
        PRIORITY    1,BUFFER                                             00024330
        PRIORITY    20                                                   00024340
        ASSIGN      26,K0                                                00024350
        TRANSFER    ,PMCV                                                00024360
PMCL    LINK        P7,P23                                               00024370
ARM24   SPLIT       1,ARM20                                              00024380
        TRANSFER    ,ARM21                                               00024390
PMCN1   ADVANCE                         10.23.74                         00024400
        TEST E      P55,PMCV,QTEST      10.23.74                         00024410
DEPQ    DEPART      V27                 10.23.74                         00024420
        PRIORITY    90                  10.23.74                         00024430
        ADVANCE     MX3(3,3)            10.23.74                         00024440
        PRIORITY    20                  10.23.74                         00024450
RETUR   TRANSFER    P,55                10.23.74                         00024460
41      PRIORITY    1,BUFFER            10.23.74                         00024470
        PRIORITY    20                  10.23.74                         00024480
        TRANSFER    ,RETUR              10.23.74                         00024490
QTEST   TEST E      P55,UNSK,QTT1       10.23.74                         00024500
        DEPART      25                  10.23.74                         00024510
        TRANSFER    ,DEPQ               10.23.74                         00024520
QTT1    DEPART      44                  10.23.74                         00024530
        TRANSFER    ,DEPQ               10.23.74                         00024540
*                                                                        00024550
*       TIME CHANGE OVERHAUL ,RETIREMENT SUBROUTINE                      00024560
*                                                                        00024570
*                                                                        00024580
ARM20   ASSIGN      22,MH6(27,P12)                                       00024590
        MSAVEVALUE  6,*14,*12,V150,H                                     00024600
        ASSIGN      12,1                                                 00024610
        ASSIGN      6,9                                                  00024620
        ASSIGN      25,K1359                                             00024630
        ASSIGN      17,19                                                00024640
        MSAVEVALUE  5+,V46,*6,K1,H                                       00024650
        SAVEVALUE   V175+,K1                                             00024660
        SAVEVALUE   525+,K1                                              00024670
        SAVEVALUE   V176+,K1                                             00024680
        SAVEVALUE   1125+,K1                                             00024690
        TRANSFER    ,MPAA                                                00024700
*                                                                        00024710
*                                                                        00024720
*                                                                        00024730
*                                                                        00024740
* FAILURE DETERMINATION ROUTINE                                          00024750
*                                                                        00024760
CMA     ASSIGN      2,FN9                                                00024770
        TABULATE    4                                                    00024780
        TEST LE     P2,K10,FDA  NEEDED TO ENSURE PROPER SAVEVALUES       00024790
*                   WHEN GREATER THAN 10 MA'S ARE FOUND                  00024800
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*                                                                    00024810
*                                                                    00024820
        SAVEVALUE  V40+,K1,H                                         00024830
FDA     ASSIGN     24+,K1                                            00024840
        ASSIGN     3,FN15                                            00024850
        TABULATE   5                                                 00024860
        TABULATE   6                                                 00024870
        SAVEVALUE  V173+,K1                                          00024880
        SAVEVALUE  500+,K1                                           00024890
        SAVEVALUE  V174+,K1                                          00024900
        SAVEVALUE  1100+,K1                                          00024910
        SAVEVALUE  V41+,K1,H                                         00024920
        ASSIGN     4,K23                                             00024930
        SAVEVALUE  1,RN2                                             00024940
        ASSIGN     5,FN22                                            00024950
        MSAVEVALUE 2,2,1,0,H                                         00024960
FDB     ASSIGN     22,V42                                            00024970
        TEST NE    P5,K1,ARM54                                       00024980
        MSAVEVALUE 2+,2,1,FN*4,H                                     00024990
ARM55   TEST LE    X1,MH2(2,1),FDD                                   00025000
        TABULATE   7                                                 00025010
        SPLIT      1,FDK,,60                                         00025020
        TEST E     P19,K7,FDL                                        00025030
        ASSIGN     19,6                                              00025040
FDC     ASSIGN     25,K1                                             00025050
FDF     LOOP       2,FDA                                             00025060
        TEST E     P25,K1,FDN                                        00025070
        TEST E     BV18,1,RLARA                                      00025080
        UNLINK     4,ARM37,1,,,ARM38                                 00025090
        SPLIT      1,ARM40,,60                                       00025100
ARM38   TEST E     P19,K5,RLARA                                      00025110
        SAVEVALUE  33+,K1                                            00025120
        TRANSFER   ,RLARA                                            00025130
FDD     LOOP       5,FDB                                             00025140
FDL     TEST E     P19,K5,FDP                                        00025150
        TEST G     RN3,FN30,FDC                                      00025160
FDR     GATE LS    1,FDF                                             00025170
        TRANSFER   ,FDC                                              00025180
FDN     TEST NE    P27,K1,FDM                                        00025190
        ASSIGN     25,K0                                             00025200
        ASSIGN     19,K0                                             00025210
        TRANSFER   P,18                                              00025220
FDK     LINK       32,FIFO                                           00025230
ARM54   MSAVEVALUE 2,2,1,999,H                                       00025240
        TRANSFER   ,ARM55                                            00025250
FDM     ASSIGN     27,K0                                             00025260
        TEST E     P35,999,ARM56                                     00025270
        ASSIGN     35,0                                              00025280
        TRANSFER   ,TSTHP                                            00025290
FDP     TEST L     RN3,V135,FDF                                      00025300
        TRANSFER   ,FDC                                              00025310
ARM56   TEST L     V147,V234,ARM17   GENERAL                         00025320
        TEST L     V11,V236,ARM17                                    00025330
        TEST L     V148,V235,ARM19   GENERAL                         00025340
        TRANSFER   ,TSTHP                                            00025350
*                                                                    00025360
*                                                                    00025370
*                                                                    00025380
*                                                                    00025390
* REPAIR LOCATION AND RESPOT SUBROUTINE                              00025400
*                                                                    00025410
RLARA   JOIN       32                                                00025420
        TEST E     P19,K5,RLARB                                      00025430
        LEAVE      1                                                 00025440
RLARB   TEST E     P16,K1,RLARC                                      00025450
        SPLIT      1,SACH,,60                                        00025460
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RLARC  TEST E      BV1,K1,RLARD                                          00025470
42     ASSIGN      18,RLARK                                              00025480
       TRANSFER    ,PFAB                                                 00025490
RLARD  MARK                                                              00025500
RLARK  TEST E      BV2,K1,RLARE                                          00025510
       TEST E      BV7,K0,RLARE                                          00025520
       ASSIGN      18,V44                                                00025530
       TEST L      P18,MX1(4,2),RLARL                                    00025540
       ASSIGN      18,MX1(4,2)                                           00025550
RLARL  ADVANCE     P18                                                   00025560
       SAVEVALUE   34+,M1                                                00025570
RLARE  PRIORITY    80,BUFFER                                             00025580
       PRIORITY    90                                                    00025590
       UNLINK      32,USMA,ALL,14,P14,AAB                                00025600
       ASSIGN      20,K123                                               00025610
       ASSIGN      24+,K1                                                00025620
       REMOVE      32                                                    00025630
       SPLIT       1,RLARH,,60                                           00025640
       TRANSFER    ,ARRA                                                 00025650
RLARH  PRIORITY    110,BUFFER                                            00025660
       SPLIT       1,RLARG,,60                                           00025670
RLARF  JOIN        32                                                    00025680
       ASSEMBLE    P24                                                   00025690
       SAVEVALUE   V187+,M1                                              00025700
       SAVEVALUE   625+,M1                                               00025710
       SAVEVALUE   V186+,M1                                              00025720
       SAVEVALUE   1225+,M1                                              00025730
       SAVEVALUE   35+,M1                                                00025740
       SAVEVALUE   V195+,M1                                              00025750
       SAVEVALUE   675+,M1                                               00025760
       SAVEVALUE   V194+,M1                                              00025770
       SAVEVALUE   1275+,M1                                              00025780
       SCAN        40,14,P14,,,RLARM                                     00025790
       REMOVE      32                                                    00025800
       JOIN        31                                                    00025810
RLARN  MATCH       RLARP                                                 00025820
       TERMINATE                                                         00025830
RLARG  JOIN        40                                                    00025840
       ASSEMBLE    P24                                                   00025850
       SAVEVALUE   36+,M1                                                00025860
       REMOVE      40                                                    00025870
RLARP  MATCH       RLARN                                                 00025880
       JOIN        32                                                    00025890
RLARQ  MATCH       ARRJ                                                  00025900
RLARM  TERMINATE                                                         00025910
*                                                                        00025920
*                                                                        00025930
*                                                                        00025940
*                                                                        00025950
*                                                                        00025960
*        REPAIR PART ASSESSMENT SUBROUTINE                               00025970
*                                                                        00025980
USMA   PRIORITY    60,BUFFER                                             00025990
       MARK                                                              00026000
       ASSIGN      18,K0                                                 00026010
       ASSIGN      25,V45                                                00026020
43     TEST NE     P25,999,RPAA  IF 999 THEN R+R 12.18.74                00026029
       TRANSFER    .*25,RPAD,RPAA                12.18.74                00026030
RPAA   ADVANCE     MX1(4,8)                                              00026040
       ASSIGN      25,K1359                                              00026050
       MSAVEVALUE  5+,V46,2,1,H                                          00026060
44     SAVEVALUE   175+,K1                                               00026070
       TEST LE     RN1,FN38,NORCA          11.12.74                      00026080
RPAC   TRANSFER    ,MPAA                                                 00026090
RPAD   MSAVEVALUE  5+,V46,1,1,H                                          00026100
       SAVEVALUE   176+,K1                                               00026110
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*                                                                       00026120
*                                                                       00026130
*   MANPOWER ASSESSMENT SUBROUTINE                                      00026140
*                                                                       00026150
 MPAA   ASSIGN      1,K3                                                00026160
 MPAB   TEST E      P25,K359,ARM1    REMOVE AND REPLACE?                00026170
        ASSIGN      V47,FN71      ASSIGN W.C. FOR REMOVE AND REPLACE    00026180
        ASSIGN      V51,FN41    ASSIGN MANPOWER REMOVE AND REPLACE      00026190
        TRANSFER    ,ARM2                                               00026200
 ARM1   ASSIGN      V47,FN39      ASSIGN W.C. ON AIRCRAFT REPAIR        00026210
        ASSIGN      V51,FN55      ASSIGN MANPOWER ON AIRCRAFT REPAIR    00026220
 ARM2   LOOP        1,MPAB                                              00026230
*                                                                       00026240
*                                                                       00026250
*   MTTR SUBROUTINE                                                     00026260
*                                                                       00026270
 ARM3   TEST E      P25,K1359,ARM4                                      00026280
 MTRA   ASSIGN      4,V55                                               00026290
        TRANSFER    ,ARM5                                               00026300
 ARM4   ASSIGN      4,V138                                              00026310
 ARM5   TABULATE    8                                                   00026320
        TEST L      P4,K1,GSEA          12.12.74 WAS K2                 00026330
        ASSIGN      4,K1                12.12.74 WAS K2                 00026340
*                                                                       00026350
*   GSE SUBROUTINE                                                      00026360
*                                                                       00026370
 GSEA   TRANSFER    ,UNSA                                               00026380
 GSEB   ASSIGN      1,V57                                               00026390
        ADVANCE     P1                                                  00026400
        SAVEVALUE   37+,P1                                              00026410
*                                                                       00026420
*                                                                       00026430
*                                                                       00026440
*                                                                       00026450
* UNSCHEDULED MAINTENANCE ROUTINE                                       00026460
*                                                                       00026470
 UNSA   TEST NE     P17,K19,ARM25                                       00026480
        ASSIGN      17,K23                                              00026490
 ARM25  TEST E      P27,K0,UNSB                                         00026500
 UNSJ   ASSIGN      3,P29                                               00026510
        ASSIGN      2,P26                                               00026520
        ASSIGN      26,K0                                               00026530
 UNSK   QUEUE       V27                                                 00026540
        QUEUE       25                                                  00026550
 UNSE   GATE LR     20,UNSC                                             00026560
        ASSIGN      7,V28                                               00026570
        ASSIGN      20,V35                                              00026600
        ASSIGN      55,UNSK          10.23.74                           00026601
        TEST G      P20,0,PMCN1      10.23.74                           00026602
        ASSIGN      8,1                                                 00026610
 UNSD   TEST GE     R*7,P3,UNSP                                         00026620
        TEST LE     P4,P20,UNSF                                         00026630
 UNSG   DEPART      V27                                                 00026640
        DEPART      25                                                  00026650
        ENTER       *7,P3                                               00026660
        ADVANCE     P4                                                  00026670
        TEST NE     BV17,K1,ARM14                                       00026680
 ARM15  LEAVE       *7,P3                                               00026690
        UNLINK      P7,UNLK,ALL                                         00026700
        MSAVEVALUE  2+,P2,P17,V36                                       00026710
        TEST NE     P17,K19,ARM10                                       00026720
 ARM61  SAVEVALUE   V58+,V36                                            00026730
        SAVEVALUE   49+,V36                                             00026740
        SAVEVALUE   V189+,V36                                           00026750
        SAVEVALUE   575+,V36                                            00026760
        SAVEVALUE   V190+,V36                                           00026770
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*                                                                                    00027440
ARRA   ASSIGN     10,C1                                                    1.27      00027450
       GATHER     P24                                                      1.27      00027451
       ASSIGN     10,0                                                     1.27      00027452
       PRIORITY   90,BUFFER                                                          00027460
       TEST NE    P20,K123,ARRB                                                      00027470
48  * ***********DELETED TEST NE  P8,K0,ARRB    THERE IS NO 2ND SHIFT                00027480
       TEST E     FN44,1,ARRB                                                        00027490
49     TRANSFER   .057,ARRB,ARRH              CH-548 DATA                2.3.75    00027500
ARRH   LOGICS     21                                                                 00027510
ARRB   ASSEMBLE   P24                                                                00027520
ARRJ   MATCH      RLARQ                                                              00027530
       ASSIGN     19,K0                                                              00027540
       ASSIGN     24,K0                                                              00027550
       ASSIGN     20,K0                                                              00027560
       ASSIGN     25,K0                                                              00027570
       ASSIGN     16,K0                                                              00027580
ARRC   TABULATE   9                                                                  00027590
       SAVEVALUE  188+,V60                                                           00027600
       TEST E     P27,K1,ARRD                                                        00027610
       ASSIGN     27,K0                                                              00027620
       TRANSFER   ,ARRE                                                              00027630
ARRD   GATE LS    21,ARRF                                                            00027640
ARRE   LOGICR     21                                                                 00027650
       TEST NE    P35,999,ARRG                                                       00027660
       TEST L     V147,V234,ARM17   GENERAL                                        00027670
       TEST L     V11,V236,ARM17                                                   00027680
       TEST L     V148,V235,ARM19   GENERAL                                        00027690
ARRG   ASSIGN     17,2                                                               00027700
       MARK       44                                                                 00027710
       ASSIGN     8,K0                                                               00027720
       TRANSFER   SBR,LIA,5                                                          00027730
       TEST LE    V13,FN2,AARH                                                       00027740
       ASSIGN     35,0                                                               00027750
       TRANSFER   ,TSTHP                                                             00027760
ARRF   GATE LR    1,AAB                                                              00027770
       TEST NE    P17,K16,AAB                                                        00027780
       TEST E     BV11,K1,AAB                                                        00027790
       TEST GE    MX1(1,3),K1,AAB   GENERAL                                        00027800
       TRANSFER   ,DLB                                                               00027810
AARH   ASSIGN     27,K1                                                              00027820
       ASSIGN     19,2                                                               00027830
       TRANSFER   ,CMA                                                               00027840
*                                                                                    00027850
*                                                                                    00027860
*                                                                                    00027870
*                                                                                    00027880
* NORS/CANNIBALIZATION ROUTINE                                                       00027890
*                                                                                    00027900
50  NORCA TEST LE    RN6,FN48,NORA          11.12.74                                 00027910
       ASSIGN     1,V61                                                              00027920
       TABULATE   10                                                                 00027930
       ASSIGN     18,K1                                                              00027940
       SPLIT      1,RLARF,,25                                                        00027950
       ADVANCE    P1                                                                 00027960
       TEST E     BV19,K1  TEST FOR PREVENTING OFF SHIFT MAINT.                      00027970
       SAVEVALUE  V232+,M1                                                           00027980
       SAVEVALUE  1425+,M1                                                           00027990
       SPLIT      1,RLARG,,25                                                        00028000
       TRANSFER   ,MPAA                                                              00028010
NORCB  SPLIT      1,NORCD                                                            00028020
       TRANSFER   ,NORCE                                                             00028030
NORCD  ADVANCE    P1                                                                 00028040
       TRANSFER   ,CAND                                                              00028050
NORA   ASSIGN     23,74                                                              00028060
       TEST E     VA2,CH2A                                                           00028070
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          TEST E     W$NORL,K0                                        00028080
          ASSIGN     1,K0                                             00028090
          GATE LS    22,NORC                                          00028100
          GATE LR    23                                               00028110
          SCAN       12,14,P14,,,NORM                                 00028120
          SPLIT      1,NORT,,60                                       00028130
          SPLIT      1,NORS,,60                                       00028140
          SPLIT      1,RLARF,,60                                      00028150
          TRANSFER   ,NORJ                                            00028160
CAND      ASSIGN     17,K22                                           00028170
          TRANSFER   ,CANP                                            00028180
NORT      UNLINK     28,NORL,1,14,P14                                 00028190
NORG      PRIORITY   110                                              00028200
NORN      JOIN       11                                               00028210
NORH      LINK       29,FIFO                                          00028220
NORM      LOGICS     23                                               00028230
          TEST E     W$NORL,K0                                        00028240
NORB      UNLINK     28,CANA,1,,,NORE                                 00028250
          SAVEVALUE  75,K0,H                                          00028260
          SAVEVALUE  *23,P22,H                                        00028270
          GATE LS    24                                               00028280
          LOGICR     24                                               00028290
          TEST E     XH75,K0,NORB                                     00028300
          ASSIGN     1,XH76                                           00028310
          UNLINK     29,CANB,1,14,P1                                  00028320
          BUFFER                                                      00028330
NORCE     TABULATE   11                                               00028340
          MSAVEVALUE 5+,V46,2,K1,H                                    00028350
          LOGICR     23                                               00028360
          ASSIGN     19,K14                                           00028370
          TABULATE   o                                                00028380
          ASSIGN     1,K5431                                          00028390
CANP      ASSIGN     3,V54                                            00028400
          ASSIGN     2,V270                                           00028410
          ASSIGN     4,V55                                            00028420
          TEST E     V269,0,SIK1      FOR 2ND W.C.                    00028421
SIK4      TEST L     P4,K1,CANE       12.12.74 WAS K5                 00028430
          ASSIGN     4,K1               12.12.74 WAS K5               00028440
CANE      QUEUE      V27                                              00028450
          QUEUE      44                                               00028460
CANH      GATE LR    20,CANF                                          00028470
          ASSIGN     7,V28                                            00028480
          ASSIGN     20,V35                                           00028510
          ASSIGN     55,CANE          10.23.74                        00028511
          TEST G     P20,0,PMCN1      10.23.74                        00028512
          ASSIGN     8,K1                                             00028520
CANG      TEST GE    R*7,P3,CANJ                                      00028530
          TEST LE    P4,P20,CANL                                      00028540
CANK      DEPART     V27                                              00028550
          DEPART     44                                               00028560
          ENTER      *7,P3                                            00028570
          ADVANCE    P4                                               00028580
          LEAVE      *7,P3                                            00028590
          UNLINK     P7,UNLK,ALL                                      00028600
          ASSIGN     17,24                                            00028610
          MSAVEVALUE 2+,P2,P17,V36                                    00028620
          SAVEVALUE  V63+,V36                                         00028630
          SAVEVALUE  61+,V36                                          00028640
          MSAVEVALUE 5+,V46,2,V36                                     00028650
          TEST E     P26,K0,CANM                                      00028660
          TEST NE    P5,K9999,CANN    FOR 2ND W.C.                    00028661
          TEST E     P1,K5431,CANN                                    00028670
          TRANSFER   ,MPAA                                            00028680
NORS      ASSIGN     18,K1                                            00028690
          TABULATE   10                                               00028700
          LINK       30,FIFO                                          00028710
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51(2)

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NORC    LOGICS      22                                                  00028720
NORD    TABULATE    10                                                  00028730
        SPLIT       1,NORG,,60                                          00028740
        SPLIT       1,RLARF,,60                                         00028750
        SPLIT       1,NORJ,,60                                          00028760
        ASSIGN      18,K1                                               00028770
NORL    PRIORITY    10,BUFFER                                           00028780
        ASSIGN      2,MX4(1,P14)                                        00028790
        JOIN        12                                                  00028800
NORF    LINK        28,P2                                               00028810
NORE    LOGICR      23                                                  00028820
        BUFFER                                                          00028830
        TRANSFER    ,NORD                                               00028840
CANB    SPLIT       1,NORN,,60                                          00028850
        ASSIGN      22,XH*23                                            00028860
        SPLIT       1,NORN,,60                                          00028870
NORJ    PRIORITY    50                                                  00028880
        ASSIGN      1,V61                                               00028890
        ASSIGN      3,V64                                               00028900
        TEST G      P3,MX(1,P14),NORK                                   00028910
        MSAVEVALUE  4,1,*14,*3                                          00028920
NORK    ADVANCE     P1                                                  00028930
        ASSIGN      19,K15                                              00028940
        TABULATE    6                                                   00028950
        TABULATE    12                                                  00028960
        GATE LR     25                                                  00028970
        TEST E      V62,CH28                                            00028980
        LOGICS      25                                                  00028990
        SAVEVALUE   62,P22                                              00029000
        UNLINK      28,NORP,ALL                                         00029010
        GATE LR     25                                                  00029020
        GATE LS     26,CAND                                             00029030
        LOGICR      26                                                  00029040
CANN    TERMINATE                                                       00029050
CANC    LOGICS      24                                                  00029060
        TEST E      P22,XH*23,NORH                                      00029070
        SAVEVALUE   75,K1,H                                             00029080
        TRANSFER    ,NORH                                               00029090
NORQ    JOIN        10                                                  00029100
        GATE LR     27                                                  00029110
        GATE LS     28,NORR                                             00029120
        TEST E      P22,X62,NORR                                        00029130
        LOGICR      28                                                  00029140
        TERMINATE                                                       00029150
NORR    REMOVE      10                                                  00029160
        PRIORITY    110                                                 00029170
        TRANSFER    ,NORH                                               00029180
CANA    ASSIGN      24,XH*23                                            00029190
        UNLINK      29,CANC,ALL,14,P14                                  00029200
        SAVEVALUE   76,P14,H                                            00029210
        PRIORITY    110,BUFFER                                          00029220
        GATE LR     23                                                  00029230
        TRANSFER    ,NORL                                               00029240
NORP    GATE LS     25,NORF                                             00029250
        LOGICS      27                                                  00029260
        UNLINK      29,NORQ,ALL,14,P14                                  00029270
        BUFFER                                                          00029280
        SCAN        10,22,X62,,,NORU                                    00029290
        LOGICS      28                                                  00029300
        LOGICR      27                                                  00029310
        LOGICR      25                                                  00029320
        TEST E      G10,K1,NORF                                         00029330
        ASSIGN      22,X62                                              00029340
NORH    LOGICS      26                                                  00029350
        TEST E      BV19,K1  TEST FOR PREVENTING OFF SHIFT MAINT.       00029360
        SAVEVALUE   634,M1                                              00029370
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         SAVEVALUE  V232+,M1          THESE SAVEVALUES SHOULD ACCOUNT      00029380
         SAVEVALUE  1425+,M1          FOR NORS BY A/C + CO.                00029390
         UNLINK     30,NORX,ALL,14,P14                                     00029400
         REMOVE     12                                                     00029410
NORX     SPLIT      1,RLARG                                                00029420
         TRANSFER   ,MPAA                                                  00029430
NORU     LOGICR     27                                                     00029440
         GATE LR    25                                                     00029450
         TRANSFER   ,NORF                                                  00029460
CANF     ASSIGN     7,V27                                                  00029470
         ASSIGN     20,V38                                                 00029480
         ASSIGN     8,K0                                                   00029490
         TRANSFER   ,CANG                                                  00029500
CANJ     ASSIGN     23,FN7                                                 00029510
         ASSIGN     21,CANH                                                00029520
         LINK       P7,P23                                                 00029530
CANL     ASSIGN     19,V39                                                 00029540
         ASSIGN     4,P20                                                  00029550
         ASSIGN     26,K1                                                  00029560
         TEST E     P4,K0,CANK                                             00029570
         DEPART     V27                                                    00029580
         DEPART     44                                                     00029590
         PRIORITY   1,BUFFER                                               00029600
         PRIORITY   90                                                     00029610
CANM     ASSIGN     4,P19                                                  00029620
         ASSIGN     26,K0                                                  00029630
         TRANSFER   ,CANE                                                  00029640
SIK1     SPLIT      1,SIK3,,66        FOR 2ND W.C.                         00029641
         TRANSFER   ,SIK4             FOR 2ND W.C.                         00029642
SIK3     ASSIGN     5,K9999           FOR 2ND W.C.                         00029643
         ASSIGN     3,V53             FOR 2ND W.C.                         00029644
         ASSIGN     2,V269            FOR 2ND W.C.                         00029645
         TRANSFER   ,SIK4             FOR 2ND W.C.                         00029646
EDSIM    ADVANCE    V245                                      1.27       00029647
         ASSIGN     14,X191                                   1.27       00029648
ACNUM    JOIN       13                                        1.27       00029650
         SCAN E     13,14PF,PF14,10PF,10PF,HER                1.27       00029651
         TEST NE    P10,0,HER                                 1.27       00029652
         SAVEVALUE  1660+,V243                                1.27       00029653
         SAVEVALUE  V244+,V243                                1.27       00029654
HER      LOOP       14,ACNUM                                  1.27       00029655
         TERMINATE                                            1.27       00029656
*                                                                         00029660
*                                                                         00029670
*                                                                         00029680
* SERVICE PLATOON, DIRECT SUPPORT, GENERAL SUPPORT COMP REPAIR            00029690
*                                                                         00029700
IMAH     ASSIGN     6,K6                                                   00029710
         TRANSFER   ,IMAG                                                  00029720
IMAA     ASSIGN     4,V65                                                  00029730
         TABULATE   13                                                     00029740
         TABULATE   14                                                     00029750
         TEST LE    V139,RN1,ARM6                                          00029760
         TEST LE    V140,RN1,ARM7                                          00029770
         TEST NE    V66,K0,IMAH                                            00029780
         TEST L     P4,K6,IMAB                                             00029790
         ASSIGN     4,K6                                                   00029800
IMAB     QUEUE      45                                                     00029810
IMAC     GATE SNF   FN49,IMAD                                              00029820
         DEPART     45                                                     00029830
         ENTER      FN49                                                   00029840
         ASSIGN     32,V67                                                 00029850
         QUEUE      V68                                                    00029860
IMAF     TEST GE    R*32,P31,IMAE                                          00029870
         DEPART     V68                                                    00029880
         ENTER      *32,P31                                                00029890
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         SAVEVALUE  V69+,V70                                    00029900
         SAVEVALUE  75+,V70                                     00029910
         ADVANCE    P4                                          00029920
         LEAVE      FN49                                        00029930
         LEAVE      *32,P31                                     00029940
         UNLINK     31,IMAC,ALL                                 00029950
         UNLINK     55,IMAF,ALL,32,P32                          00029960
         ASSIGN     6,K3                                        00029970
         SAVEVALUE  77,RN7,H                                    00029980
         TEST L     XH77,V71,ARM45                              00029990
         ASSIGN     6+,K3                                       00030000
         TEST G     XH77,V72,ARM46                              00030010
         ASSIGN     6-,K2                                       00030020
         TEST G     XH77,V73,ARM47                              00030030
         ASSIGN     6+,K1                                       00030040
         SAVEVALUE  182+,K1                                     00030050
IMAG     MSAVEVALUE 5+,V46,*6,K1,H                              00030060
         MSAVEVALUE 5+,V46,*6,V70                               00030070
         SAVEVALUE  V193+,V70                                   00030080
         SAVEVALUE  650+,V70                                    00030090
         SAVEVALUE  V192+,V70                                   00030100
         SAVEVALUE  1250+,V70                                   00030110
         TEST E     P6,K6,SMGQ                                  00030120
DEPA     TABULATE   15                                          00030130
         TERMINATE                                              00030140
ARM45    SAVEVALUE  179+,K1                                     00030150
         TRANSFER   ,IMAG                                       00030160
ARM46    SAVEVALUE  180+,K1                                     00030170
         TRANSFER   ,ARM26                                      00030180
ARM47    SAVEVALUE  181+,K1                                     00030190
         TRANSFER   ,ARM26                                      00030200
ARM6     ASSIGN     12,4                                        00030210
         PRIORITY   0                                           00030220
         ASSIGN     29,P31                                      00030230
         ASSIGN     30,K0                                       00030240
         TEST E     P28,K5,ARM8                                 00030250
         ASSIGN     26,K2                                       00030260
ARM9     ASSIGN     27,0                                        00030270
         ASSIGN     17,18                                       00030280
         ASSIGN     6,7                                         00030290
         SAVEVALUE  177+,K1                                     00030300
         MSAVEVALUE 5+,V46,*6,K1,H                              00030310
         TRANSFER   ,UNSJ                                       00030320
ARM8     ASSIGN     26,3                                        00030330
         TRANSFER   ,ARM9                                       00030340
IMAD     LINK       31,FIFO                                     00030350
IMAE     LINK       55,FIFO                                     00030360
ARM7     ASSIGN     32,V141                                     00030370
         QUEUE      V142                                        00030380
ARM13    TEST GE    R*32,P31,ARM12                              00030390
         DEPART     V142                                        00030400
         ENTER      *32,P31                                     00030410
         SAVEVALUE  V143+,V70                                   00030420
         SAVEVALUE  167+,V70                                    00030430
         ADVANCE    P4                                          00030440
         LEAVE      *32,P31                                     00030450
         UNLINK     57,ARM13,ALL,32,P32                         00030460
         ASSIGN     6,8                                         00030470
         SAVEVALUE  178+,K1                                     00030480
         TRANSFER   ,IMAG                                       00030490
ARM12    LINK       57,FIFO                                     00030500
ARM26    ASSIGN     12,24                                       00030510
ARM27    TEST NE    P22,MH6(27,*12),ARM28                       00030520
         LOOP       12,ARM27                                    00030530
         TRANSFER   ,IMAG                                       00030540
ARM28    SPLIT      1,ARM29,,60                                 00030550
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        TRANSFER    ,IMAG                                          00030560
ARM29   TEST E      P6,MH6(26,*12),SMGQ                            00030570
        MSAVEVALUE  6,*14,*12,V150,H                               00030580
        TERMINATE                                                  00030590
*                                                                  00030600
*                                                                  00030610
*                                                                  00030620
*                                                                  00030630
* MANPOWER CONTROL ROUTINE                                         00030640
*                                                                  00030650
*                                                                  00030660
*   SHIFT TERMINATION SUBROUTINE                                   00030670
*                                                                  00030680
MPCA    PRIORITY    100                                            00030690
        SPLIT       1,MPCE,,25                                     00030700
        SPLIT       3,MPCB,2,25                                    00030710
MPCB    ASSIGN      3,MX3(*2,2)                                    00030720
        TEST GE     P3,K1,SMGQ                                     00030730
        ASSIGN      5,MX3(*2,3)                                    00030740
        ADVANCE     V74                                            00030750
MPCN    ASSIGN      1,K31                                          00030760
        SPLIT       22,MPCX,1,25                                   00030770
MPCC    LOGICS      29                                             00030780
        SPLIT       1,MPCD,,25                                     00030790
        ADVANCE     P5                                             00030800
        UNLINK      56,SMGQ,1,13                                   00030810
        UNLINK      56,MPCF,1,13,,MPCG                             00030820
        ADVANCE     P3                                             00030830
        TRANSFER    ,MPCC                                          00030840
MPCX    TEST L      R*1,K900,SMGQ                                  00030850
        TEST E      S*1,K0,MPCJA                                   00030860
MPCL    ASSIGN      11,R*1                                         00030870
        ENTER       *1,P11                                         00030880
        GATE LR     29                                             00030890
        LEAVE       *1,P11                                         00030900
        TERMINATE                                                  00030910
MPCK    ASSIGN      15,V76                                         00030920
        ASSIGN      8,P15                                          00030930
MPCJB   SPLIT       1,MPCL,,25                                     00030940
        ASSIGN      21,MPCM                                        00030950
        ASSIGN      23,K1                                          00030960
        LINK        P1,P23                                         00030970
MPCD    LINK        56,FIFO                                        00030980
MPCF    TRANSFER    ,MPCD                                          00030990
MPCM    TEST E      P8,R*1,MPCK                                    00031000
        TRANSFER    ,MPCL                                          00031010
MPCG    LOGICR      29                                             00031020
        ADVANCE     P3                                             00031030
        UNLINK      56,MPCF,1,13,,MPCN                             00031040
        TRANSFER    ,MPCC                                          00031050
MPCJA   ASSIGN      8,S*1                                          00031060
        TRANSFER    ,MPCJB                                         00031070
*                                                                  00031080
*                                                                  00031090
*   SHIFT CHANGE SUBROUTINE                                        00031100
*                                                                  00031110
MPCE    ASSIGN      3,MX3(1,1)                                     00031120
        ASSIGN      2,MX3(2,1)                                     00031130
        ADVANCE     MX3(1,4)                                       00031140
MPCJ    LOGIC1      20                                             00031150
        GATE LR     30,MPCAA                                       00031160
        LOGIC1      30                                             00031170
        ASSIGN      4,11                                           00031180
MPCAB   UNLINK      V77,UNLK,ALL                                   00031190
        LOOP        4,MPCAB                                        00031200
MPCAD   ADVANCE     P3                                             00031210
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        TRANSFER    ,MPCJ                                                    00031220
MPCAA   LOGIC1      30                                                       00031230
        ASSIGN      4,11                                                     00031240
MPCAC   UNLINK      V78,UNLK,ALL                                             00031250
        LOOP        4,MPCAC                                                  00031260
        ADVANCE     P2                                                       00031270
        ADVANCE     V145                                                     00031280
        TRANSFER    ,MPCJ                                                    00031290
*                                                                            00031300
*                                                                            00031310
* DATA COMPILATION ROUTINE                                                   00031320
*                                                                            00031330
DCRA    ASSIGN      3,MX1(5,1)                                               00031340
        PRIORITY    1,BUFFER                                                 00031350
        ADVANCE     V9              RUN TIME MINUS 2                         00031370
        MSAVEVALUE  1,6,11,V84                                               00031400
        ASSIGN      5,11                                                     00031410
ARM35   ASSIGN      1,V178                                                   00031420
        ASSIGN      2,V179                                                   00031430
        ASSIGN      3,V180                                                   00031440
        ASSIGN      4,V181                                                   00031450
        SAVEVALUE   V177+,V182                                               00031460
        SAVEVALUE   V188+,V182                                               00031470
        LOOP        5,ARM35                                                  00031480
        SAVEVALUE   550+,V183                                                00031490
        SAVEVALUE   1150+,V183                                               00031500
        ASSIGN      6,K1                                                     00031510
        ASSIGN      1,526                                                    00031520
        ASSIGN      2,551                                                    00031530
        ASSIGN      3,251                                                    00031540
        ASSIGN      4,776                                                    00031550
        ASSIGN      5,1451                                                   00031560
ARM44   ASSIGN      7,V212                                                   00031570
        SAVEVALUE   V193,V213                                                00031580
        TEST E      P6,X191,ARM43                                            00031590
        SAVEVALUE   650,V214                                                 00031600
        SAVEVALUE   183,V215                                                 00031610
        ASSIGN      2,699                                                    00031620
        ASSIGN      3,1424      ESTABLISH SAVEVALUE NOS. FOR NORS /AVAIL.    00031630
        ASSIGN      1,674                                                    00031640
ARM49   SAVEVALUE   *2,V216                                                  00031650
        ASSIGN      2-,K1                                                    00031660
        ASSIGN      3-,K1       SET UP SAVE NOS FOR NORS TO CALC. AVAIL      00031670
        TEST NE     P1,651,ARM48                                             00031680
        LOOP        1,ARM49                                                  00031690
        TERMINATE                                                            00031700
ARM48   SAVEVALUE   700,V217                                                 00031710
        ASSIGN      1,226                                                    00031720
        ASSIGN      2,1426                                                   00031730
        ASSIGN      3,201                                                    00031740
        ASSIGN      4,701                                                    00031750
ARM50   SAVEVALUE   *4,V219                                                  00031760
        TEST NE     P4,724,ARM51                                             00031770
        ASSIGN      1+,1                                                     00031780
        ASSIGN      2+,1                                                     00031790
        ASSIGN      3+,1                                                     00031800
        ASSIGN      4+,1                                                     00031810
        TRANSFER    ,ARM50                                                   00031820
ARM51   SAVEVALUE   725,V220                                                 00031830
        ASSIGN      1,226                                                    00031840
        ASSIGN      2,201                                                    00031850
        ASSIGN      3,726                                                    00031860
ARM52   SAVEVALUE   *3,V218                                                  00031870
        TEST NE     P3,750,ARM53                                             00031880
        ASSIGN      1+,1                                                     00031890
        ASSIGN      2+,1                                                     00031900
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        ASSIGN      3+,1                                    00031910
        TRANSFER    ,ARM52                                  00031920
ARM53   SAVEVALUE   750,V221                                00031930
        ASSIGN      2,K11                                   00031940
DCRB    ASSIGN      3,MX1(6,P2)                             00031950
        TEST GE     P3,K1,DCRC                              00031960
        ASSIGN      17,25                                   00031970
        MSAVEVALUE  2+,P2,P17,P3                            00031980
        SAVEVALUE   20+,P3                                  00031990
        SAVEVALUE   V30+,P3                                 00032000
DCRC    LOOP        2,DCRB                                  00032010
        TEST E      MX1(5,8),K0,DCRE                        00032020
DCRD    UNLINK      27,REAA,ALL                             00032030
        UNLINK      28,REAB,ALL                             00032040
DCRE    BUFFER                                              00032050
        ASSIGN      2,25                                    00032060
DCRG    ASSIGN      3,K14                                   00032070
DCRF    ASSIGN      5,MX2(*3,*2)                            00032080
        MSAVEVALUE  2+,15,*2,*5                             00032090
        LOOP        3,DCRF                                  00032100
        LOOP        2,DCRG                                  00032110
REED    TRANSFER    ,REEA                                   00032120
ARM43   ASSIGN      1+,K1                                   00032130
        ASSIGN      2+,K1                                   00032140
        ASSIGN      3+,K1                                   00032150
        ASSIGN      4+,K1                                   00032160
        ASSIGN      5+,K1                                   00032170
        ASSIGN      6+,K1                                   00032180
        TRANSFER    ,ARM44                                  00032190
REEA    SAVEVALUE   185,V229                                00032200
        SAVEVALUE   186,V230                                00032210
        TERMINATE   1                                       00032230
REAA    ASSIGN      2,K3                                    00032240
        ASSIGN      3,MX1(5,7)                              00032250
        MSAVEVALUE  2+,4,17,P3                              00032260
        SAVEVALUE   V37+,P3                                 00032270
        SAVEVALUE   32+,P3                                  00032280
REEG    SAVEVALUE   90+,M1                                  00032290
        SAVEVALUE   187+,M1                                 00032300
        SAVEVALUE   V185+,M1                                00032310
        SAVEVALUE   600+,M1                                 00032320
        SAVEVALUE   V184+,M1                                00032330
        SAVEVALUE   1200+,M1                                00032340
        SAVEVALUE   V195+,M1                                00032350
        SAVEVALUE   675+,M1                                 00032360
        SAVEVALUE   V194+,M1                                00032370
        SAVEVALUE   1275+,M1                                00032380
        TERMINATE                                           00032390
REAB    TABULATE    9                                       00032400
        SAVEVALUE   36+,M1                                  00032410
        SAVEVALUE   63+,M1                                  00032420
        TERMINATE                                           00032430
PMCB    TERMINATE                                           00032440
DATA    PRIORITY    0                                       00032450
        ADVANCE     K60                                     00032460
DATA1   ASSIGN      2,K4                                    00032470
DATA2   ADVANCE     230                                     00032480
        TEST E      V224,K0,DATA4                           00032490
DATA3   ADVANCE     K10                                     00032500
        LOOP        2,DATA2                                 00032510
        ADVANCE     K710                                    00032520
        TEST E      V224,K0,DATA6                           00032530
DATA5   ADVANCE     K10                                     00032540
        TRANSFER    ,DATA1                                  00032550
DATA4   SAVEVALUE   188-,V225                               00032560
        SAVEVALUE   187-,V227                               00032570
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      TRANSFER   ,DATA3                                                  00032580
DATA6 SAVEVALUE  188-,V226                                               00032590
      SAVEVALUE  187-,V228                                               00032600
      TRANSFER   ,DATA5                                                  00032610
      RMULT      ,,,,,,,,31                                              00032620
      START      1,,,1                                                   00032630
      REPORT                                                             00032640
      EJECT                                                              00032654
      SPACE      3                                                       00032660
 57   TEXT       ARMY R + M SIMULATION MODEL                             00032670
 57   TEXT       ------------------------                                00032680
      SPACE      2                                                       00032690
 2    TEXT       SCENARIO SIMULATED                                      00032700
      SPACE      1                                                       00032710
 4    TEXT       ONE PLATOON OF NINE CH-54B ARMY HELICOPTERS             00032720
      SPACE      1                                                       00032730
 4    TEXT       FLYING PROGRAM CONSISTED OF FIVE FLYING DAYS PER WEEK   00032740
      SPACE      1                                                       00032760
 4    TEXT       MISSION LENGTH IS 1.8 HOURS                             00032770
      SPACE      1                                                       00032790
 4    TEXT       LAUNCH SCHEDULE DURING EACH FLYING DAY                  00032800
 6    TEXT                                                               00032810
 6    TEXT                                                               00032820
 6    TEXT                                                               00032830
 6    TEXT                                                               00032840
 6    TEXT                                                               00032850
      SPACE      1                                                       00032860
 4    TEXT       OTHER FLIGHT CONSIDERATIONS                             00032870
      SPACE      1                                                       00032871
 6    TEXT       STANDBY AIRCRAFT READY AT ALL TIMES DURING THE SCHEDU*00032880
LED FLYING INTERVALS.                                                    00032890
      SPACE      1                                                       00032891
 6    TEXT       MISSION FLIGHT IS POSSIBLE UP TO THIRTY MINUTES AFTER*00032900
 SCHEDULED FLIGHT TIME. AFTER THIS INTERVAL, FLIGHT IS SCRUBBED.         00032910
      SPACE      2                                                       00032920
 2    TEXT       MAINTENANCE CONCEPT SIMULATED                           00032930
      SPACE      1                                                       00033000
 4    TEXT       PREVENTIVE MAINTENANCE DAILY (PMD) INSPECTIONS OCCUR *00033010
DAILY IF THE AIRCRAFT HAS FLOWN OR EVERY 72 HOURS IF NOT FLYING.         00033020
      SPACE      1                                                       00033030
 4    TEXT       INTERMEDIATE MAINTENANCE INSPECTIONS OCCUR EVERY 25 H*00033031
OURS.                                                                    00033032
      SPACE      1                                                       00033033
 4    TEXT       PERIODIC MAINTENANCE INSPECTIONS OCCUR EVERY 100 HOUR*00033034
S.                                                                       00033035
      SPACE      2                                                       00033036
 4    TEXT       MAINTENANCE PERSONNEL ARE AVAILABLE BETWEEN 0830 AND *00033040
1630 DURING THE FIVE DAY FLYING PERIOD PER WEEK.                         00033050
      SPACE      1                                                       00033060
      SPACE      1                                                       00033090
 4    TEXT       THE AIRCRAFT CONSISTS OF 296 ELEMENTS. THERE ARE 21 T*00033100
IME CHANGE COMPONENTS.                                                   00033110
      SPACE      1                                                       00033120
 4    TEXT       ORGANIZATIONAL MAINTENANCE INCLUDES AN INTEGRATED DIR*00033160
ECT SUPPORT MAINTENANCE CAPABILITY.                                      00033170
      SPACE      1                                                       00033180
 4    TEXT       OFF EQUIPMENT COMPONENT MAINTENANCE IS DUMMIED OUT.     00033190
      SPACE      1                                                       00033220
 4    TEXT       CONDEMNATION OR NRTS STATUS IS DUMMIED OUT.             00033230
      SPACE      1                                                       00033240
 4    TEXT       NORS AND CANNIBALIZATION ROUTINE IS ACTIVE.             00033241
      SPACE      2                                                       00033242
 2    TEXT       EVALUATION THIS SIMULATION RUN:                         00033250
      SPACE      1                                                       00033260
 10   TEXT       BASIC CH-54B MISSION AND MAINTENANCE PHILOSOPHY         00033270
 10   TEXT                                                               00033271
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        SPACE   1                                                       00033272
 10     TEXT                                                            00033273
        SPACE   1                                                       00033274
        EJECT                                                           00033280
 19     TEXT                          MISSION                           00033290
        SPACE   1                                                       00033300
 19     TEXT                        INFORMATION                         00033310
*                                   -----------                         00033320
        SPACE   3                                                       00033330
 10     TEXT    AIRCRAFT              MISSIONS          MISSIONS        *00033340
    MISSION                                                             00033350
 10     TEXT    TAIL NUMBER           CALLED            FLOWN           *00033360
    FLYING HOURS                                                        00033370
        SPACE   3                                                       00033380
 10     TEXT        1                 #X201,2/XXX#              #X226*00033390
,2/XXX#             #X251,2/1LXXX.X#                                    00033400
*                                                                       00033410
        SPACE   3                                                       00033420
 10     TEXT        2                 #X202,2/XXX#              #X227*00033430
,2/XXX#             #X252,2/1LXXX.X#                                    00033440
        SPACE   3                                                       00033450
 10     TEXT        3                 #X203,2/XXX#              #X228*00033460
,2/XXX#             #X253,2/1LXXX.X#                                    00033470
        SPACE   3                                                       00033480
 10     TEXT        4                 #X204,2/XXX#              #X229*00033490
,2/XXX#             #X254,2/1LXXX.X#                                    00033500
        SPACE   3                                                       00033510
 10     TEXT        5                 #X205,2/XXX#              #X230*00033520
,2/XXX#             #X255,2/1LXXX.X#                                    00033530
        SPACE   3                                                       00033540
 10     TEXT        6                 #X206,2/XXX#              #X231*00033550
,2/XXX#             #X256,2/1LXXX.X#                                    00033560
        SPACE   3                                                       00033570
 10     TEXT        7                 #X207,2/XXX#              #X232*00033580
,2/XXX#             #X257,2/1LXXX.X#                                    00033590
        SPACE   3                                                       00033600
 10     TEXT        8                 #X208,2/XXX#              #X233*00033610
,2/XXX#             #X258,2/1LXXX.X#                                    00033620
        SPACE   3                                                       00033630
 10     TEXT        9                 #X209,2/XXX#              #X234*00033640
,2/XXX#             #X259,2/1LXXX.X#                                    00033650
 10     TEXT        ------------------------------------------------*00034110
-------------------------------------                                   00034120
        SPACE   2                                                       00034130
 10     TEXT          TOTALS          #X225,2/XXXX#             #X250*00034140
,2/XXXX#             #X275,2/1LXXXX.X#                                  00034150
        EJECT                                                           00034160
 19     TEXT                        SCHEDULED                           00034170
        SPACE   1                                                       00034180
 19     TEXT                  INSPECTION INFORMATION                    00034190
*                             ----------------------                    00034200
        SPACE   3                                                       00034210
 4      TEXT    AIRCRAFT      PREFLIGHT       PREFLIGHT       DAILY     *00034220
     DAILY        PMI             PMI             PMP             PMP   00034230
 4      TEXT    TAIL          NUMBER OF       MAINT.          NUMBER OF *00034240
     MAINT.       NUMBER OF       MAINT           NUMBER OF       MAINT 00034250
 4      TEXT    NUMBER        INSPECTION      MAN HRS.        INSPECTION*00034260
     MAN HRS.     INSPECTION      MAN HRS.        INSPECTION      MAN HR 00034270
        SPACE   3                                                       00034280
 3      TEXT        1           #X276,2/XXX#            #X301,2/2LXXX.X*00034290
X#          #X326,2/XXX#            #X351,2/2LXXX.XX#                  00034300
 78     TEXT    #X376,2/XXX#            #X401,2/2LXXX.XX#           #X*00034310
426,2/XXX#          #X451,2/2LXXX.XX#                                   00034320
        SPACE   3                                                       00034330
 3      TEXT        2           #X277,2/XXX#            #X302,2/2LXXX.X*00034340
X#          #X327,2/XXX#            #X352,2/2LXXX.XX#                  00034350
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 76     TEXT        #X377,2/XXX#              #X402,2/2LXXX.XX#              #X*00034360
427,2/XXX#           #X452,2/2LXXX.XX#                                          00034370
        SPACE       3                                                          00034380
 3      TEXT          3             #X278,2/XXX#             #X303,2/2LXXX.X*00034390
X#           #X328,2/XXX#              #X353,2/2LXXX.XX#                      00034400
 78     TEXT        #X378,2/XXX#              #X403,2/2LXXX.XX#              #X*00034410
428,2/XXX#           #X453,2/2LXXX.XX#                                          00034420
        SPACE       3                                                          00034430
 3      TEXT          4             #X279,2/XXX#             #X304,2/2LXXX.X*00034440
X#           #X329,2/XXX#              #X354,2/2LXXX.XX#                      00034450
 78     TEXT        #X379,2/XXX#              #X404,2/2LXXX.XX#              #X*00034460
429,2/XXX#           #X454,2/2LXXX.XX#                                          00034470
        SPACE       3                                                          00034480
 3      TEXT          5             #X280,2/XXX#             #X305,2/2LXXX.X*00034490
X#           #X330,2/XXX#              #X355,2/2LXXX.XX#                      00034500
 78     TEXT        #X380,2/XXX#              #X405,2/2LXXX.XX#              #X*00034510
430,2/XXX#           #X455,2/2LXXX.XX#                                          00034520
        SPACE       3                                                          00034530
 3      TEXT          6             #X281,2/XXX#             #X306,2/2LXXX.X*00034540
X#           #X331,2/XXX#              #X356,2/2LXXX.XX#                      00034550
 78     TEXT        #X381,2/XXX#              #X406,2/2LXXX.XX#              #X*00034560
431,2/XXX#           #X456,2/2LXXX.XX#                                          00034570
        SPACE       3                                                          00034580
 3      TEXT          7             #X282,2/XXX#             #X307,2/2LXXX.X*00034590
X#           #X332,2/XXX#              #X357,2/2LXXX.XX#                      00034600
 78     TEXT        #X382,2/XXX#              #X407,2/2LXXX.XX#              #X*00034610
432,2/XXX#           #X457,2/2LXXX.XX#                                          00034620
        SPACE       3                                                          00034630
 3      TEXT          8             #X283,2/XXX#             #X308,2/2LXXX.X*00034640
X#           #X333,2/XXX#              #X358,2/2LXXX.XX#                      00034650
 78     TEXT        #X383,2/XXX#              #X408,2/2LXXX.XX#              #X*00034660
433,2/XXX#           #X458,2/2LXXX.XX#                                          00034670
        SPACE       3                                                          00034680
 3      TEXT          9             #X284,2/XXX#             #X309,2/2LXXX.X*00034690
X#           #X334,2/XXX#              #X359,2/2LXXX.XX#                      00034700
 78     TEXT        #X384,2/XXX#              #X409,2/2LXXX.XX#              #X*00034710
434,2/XXX#           #X459,2/2LXXX.XX#                                          00034720
 16     TEXT        ------------------------------------------------------*00035490
-------------------------------------                                       00035500
*                                                                           00035510
*                                                                           00035520
 4      TEXT        TOTALS        #X300,2/XXXX#          #X325,2/2LXXXX.XX*00035540
#          #X350,2/XXXX#             #X375,2/2LXXXX.XX#                     00035550
 76     TEXT        #X400,2/XXX#              #X425,2/2LXXXX.XX#             #X*00035560
450,2/XXX#           #X475,2/2LXXXX.XX#                                         00035570
        EJECT                                                                  00035580
        SPACE       3                                                          00035590
 19     TEXT                          MAINTENANCE                            00035600
        SPACE       1                                                          00035610
 19     TEXT                          INFORMATION                            00035620
        SPACE       3                                                          00035630
 4      TEXT        AIRCRAFT      NUMBER OF MAINT ACTIONS        MAINTENANC*00035640
E MAN HOURS          ELAPSED MAINT. DOWNTIME                                   00035650
 4      TEXT        TAIL                                                       00035660
 4      TEXT        NUMBER        UNSCHEDULED     SCHEDULED       UNSCHEDULE*00035670
D      SCHEDULED     UNSCHEDULED     SCHEDULED                                00035680
        SPACE       3                                                          00035690
 5      TEXT        1           #X476,2/XXXX#          #X501,2/XXXX#     *00035700
        #X551,2/2LXXXX.XX#          #X526,2/2LXXXX.XX#                     00035710
 77     TEXT        #X601,2/1LXXXX.X#         #X576,2/1LXXXX.X#              00035720
        SPACE       3                                                          00035730
 5      TEXT        2           #X477,2/XXXX#          #X502,2/XXXX#     *00035740
        #X552,2/2LXXXX.XX#          #X527,2/2LXXXX.XX#                     00035750
 77     TEXT        #X602,2/1LXXXX.X#         #X577,2/1LXXXX.X#              00035760
        SPACE       3                                                          00035770
 5      TEXT        3           #X478,2/XXXX#          #X503,2/XXXX#     *00035780
```

```
      #X553,2/2LXXXX.XX#          #X528,2/2LXXXX.XX#                                00035790
77    TEXT        #X603,2/1LXXXX.X#          #X578,2/1LXXXX.X#                     00035800
      SPACE       3                                                                 00035810
5     TEXT        4           #X479,2/XXXX#          #X504,2/XXXX#                 *00035820
      #X554,2/2LXXXX.XX#          #X529,2/2LXXXX.XX#                                00035830
77    TEXT        #X604,2/1LXXXX.X#          #X579,2/1LXXXX.X#                     00035840
      SPACE       3                                                                 00035850
5     TEXT        5           #X480,2/XXXX#          #X505,2/XXXX#                 *00035860
      #X555,2/2LXXXX.XX#          #X530,2/2LXXXX.XX#                                00035870
77    TEXT        #X605,2/1LXXXX.X#          #X580,2/1LXXXX.X#                     00035880
      SPACE       3                                                                 00035890
5     TEXT        6           #X481,2/XXXX#          #X506,2/XXXX#                 *00035900
      #X556,2/2LXXXX.XX#          #X531,2/2LXXXX.XX#                                00035910
77    TEXT        #X606,2/1LXXXX.X#          #X581,2/1LXXXX.X#                     00035920
      SPACE       3                                                                 00035930
5     TEXT        7           #X482,2/XXXX#          #X507,2/XXXX#                 *00035940
      #X557,2/2LXXXX.XX#          #X532,2/2LXXXX.XX#                                00035950
77    TEXT        #X607,2/1LXXXX.X#          #X582,2/1LXXXX.X#                     00035960
      SPACE       3                                                                 00035970
5     TEXT        8           #X483,2/XXXX#          #X508,2/XXXX#                 *00035980
      #X558,2/2LXXXX.XX#          #X533,2/2LXXXX.XX#                                00035990
77    TEXT        #X608,2/1LXXXX.X#          #X583,2/1LXXXX.X#                     00036000
      SPACE       3                                                                 00036010
5     TEXT        9           #X484,2/XXXX#          #X509,2/XXXX#                 *00036020
      #X559,2/2LXXXX.XX#          #X534,2/2LXXXX.XX#                                00036030
77    TEXT        #X609,2/1LXXXX.X#          #X584,2/1LXXXX.X#                     00036040
16    TEXT        ----------------------------------------------------------------*00036660
-------------------------------                                                     00036670
4     TEXT        TOTALS      #X500,2/XXX#           #X525,2/XXX#                  *00036690
      #X575,2/2LXXXXX.XX#         #X550,2/2LXXXXX.XX#                               00036700
77    TEXT        #X625,2/1LXXXX.X#          #X600,2/1LXXXX.X#                     00036710
      EJECT                                                                         00036720
      SPACE       3                                                                 00036730
19    TEXT                          AIRCRAFT                                        00036740
      SPACE       1                                                                 00036750
19    TEXT                        CHARACTERISTICS                                   00036760
*                               ------------------                                00036770
      SPACE       2                                                                 00036780
4     TEXT        AIRCRAFT      DIRECT          NOT              NOT              *00036790
            AVAILABILITY                                                            00036800
4     TEXT        TAIL          MAINT. MAN      OPERATIONALLY    OPERATIONA*00036810
LLY   ------------------------------                                               00036820
4     TEXT        NUMBER        HOURS PER       READY-           READY-           *00036830
    UP TIME/      MISSIONS FLOWN/         MISSIONS COMP/                          00036840
4     TEXT                      FLIGHT HR.      MAINTENANCE      SUPPLY           *00036850
    TOTAL TIME    MISSIONS CALLED         MISSIONS CALLED                         00036860
*---------------------------------------------------------------------------------*00036870
-------------------------------                                                     00036880
      SPACE       2                                                                 00036890
5     TEXT        1           #X626,2/2LXX.XX#          #X651,2/1LXXXX.*00036900
X#          #X1401,2/1LXXXX.X#        #X676,2/2LXX.XX#                            00036910
7o    TEXT        #X701,2/2LXXX.XX#                  #X726,2/2LXXX.XX#            00036920
      SPACE       2                                                                 00036930
5     TEXT        2           #X627,2/2LXX.XX#          #X652,2/1LXXXX.*00036940
X#          #X1402,2/1LXXXX.X#        #X677,2/2LXX.XX#                            00036950
76    TEXT        #X702,2/2LXXX.XX#                  #X727,2/2LXXX.XX#            00036960
      SPACE       2                                                                 00036970
5     TEXT        3           #X628,2/2LXX.XX#          #X653,2/1LXXXX.*00036980
X#          #X1403,2/1LXXXX.X#        #X678,2/2LXX.XX#                            00036990
7o    TEXT        #X703,2/2LXXX.XX#                  #X728,2/2LXXX.XX#            00037000
      SPACE       2                                                                 00037010
5     TEXT        4           #X629,2/2LXX.XX#          #X654,2/1LXXXX.*00037020
X#          #X1404,2/1LXXXX.X#        #X679,2/2LXX.XX#                            00037030
76    TEXT        #X704,2/2LXXX.XX#                  #X729,2/2LXXX.XX#            00037040
      SPACE       2                                                                 00037050
5     TEXT        5           #X630,2/2LXX.XX#          #X655,2/1LXXXX.*00037060
```

```
X#           #X1405,2/1LXXXX.X#       #X680,2/2LXX.XX#                          00037070
 76     TEXT        #X705,2/2LXXX.XX#                  #X730,2/2LXXX.XX#      00037080
        SPACE       2                                                         00037090
 5      TEXT        6            #X631,2/2LXX.XX#          #X656,2/1LXXXX.*00037100
X#           #X1406,2/1LXXXX.X#       #X681,2/2LXX.XX#                          00037110
 76     TEXT        #X706,2/2LXXX.XX#                  #X731,2/2LXXX.XX#      00037120
        SPACE       2                                                         00037130
 5      TEXT        7            #X632,2/2LXX.XX#          #X657,2/1LXXXX.*00037140
X#           #X1407,2/1LXXXX.X#       #X682,2/2LXX.XX#                          00037150
 76     TEXT        #X707,2/2LXXX.XX#                  #X732,2/2LXXX.XX#      00037160
        SPACE       2                                                         00037170
 5      TEXT        8            #X633,2/2LXX.XX#          #X658,2/1LXXXX.*00037180
X#           #X1408,2/1LXXXX.X#       #X683,2/2LXX.XX#                          00037190
 76     TEXT        #X708,2/2LXXX.XX#                  #X733,2/2LXXX.XX#      00037200
        SPACE       2                                                         00037210
 5      TEXT        9            #X634,2/2LXX.XX#          #X659,2/1LXXXX.*00037220
X#           #X1409,2/1LXXXX.X#       #X684,2/2LXX.XX#                          00037230
 76     TEXT        #X709,2/2LXXX.XX#                  #X734,2/2LXXX.XX#      00037240
 16     TEXT          ----------------------------------------------------*00037850
---------------------------------------------------------------------------- 00037860
 4      TEXT        TOTALS       #X650,2/2LXX.XX#          #X675,2/1LXXXX*00037880
X.X#          #X1425,2/1LXXXXX.X#        #X700,2/2LXX.XX#                       00037890
 77     TEXT        #X725,2/2LXX.XX#                   #X750,2/2LXX.XX#       00037900
        EJECT                                                                 00037910
        SPACE       3                                                         00037920
 30     TEXT         PLATOON STATISTICS                                       00037930
        SPACE       3                                                         00037940
 15     TEXT        TOTAL FLYING HOURS                          #X183,2/1LX*00037950
XXX.X#                                                                        00037960
        SPACE       2                                                         00037970
 18     TEXT        FLYING HOURS-COMPLETED MISSIONS             #X275,2/1LX*00037980
XXX.X#                                                                        00037990
        SPACE       1                                                         00038000
 18     TEXT        FLYING HOURS-ABORTED MISSIONS               #X1475,2/1L*00038010
XXX.X#                                                                        00038020
        SPACE       1                                                         00038030
 18     TEXT        FLYING HOURS-TEST HOPS                      #X800,2/1LX*00038040
XX.X#                                                                         00038050
        SPACE       3                                                         00038060
 15     TEXT        THE SERVICE PLATOON PERFORMED #X176,2/XXX# ON AIRCRAF*00038070
T REPAIRS.                                                                    00038080
        SPACE       2                                                         00038090
 15     TEXT        THE SERVICE PLATOON ALSO REMOVED AND REPLACED #X175,2*00038100
/XXX# PARTS ON THE AIRCRAFT.                                                  00038110
        OUTPUT                                                                00038290
        END                                                                   00038300
```

APPENDIX V

FACTORIAL APPROACH TO SIMULATION MODEL SENSITIVITY ANALYSIS

The factorial approach incorporated into this study is a powerful method of optimizing the number of test simulation runs to provide the output statistics required for analysis.

The purposes of this appendix are to give the statistical background upon which the factorial analysis is based and to provide the tables and statistical evidence of significant effects observed in other output parameters studied and referred to in the main body of this report.

The first step is to develop an independent estimate of simulation or experimental error. Table III in this appendix and Table VIII in the main body of the report, show four separate computer runs under identical conditions, except that the random number seed was changed. The variation, or simulation error, associated with operational availability was computed from these four runs by the following formula:

$$\text{Variance} = \frac{\Sigma (x_i - \bar{x})^2}{N - 1}$$

where x_i is the individual observations, $\bar{x}$ is the mean of the observations, and N is the number of observations.

Therefore, the variance associated with the output statistic of operational availability is

$$\frac{(55.98 - 56.62)^2 + (58.48 - 56.62)^2 + (54.06 - 56.62)^2 + (57.95 - 56.62)^2}{4 - 1}$$

$$\frac{.410 + 3.460 + 6.554 + 1.769}{3} = \frac{12.193}{3} = 4.06$$

The second step is to see if the variation that occurs when a factor level is changed is consistent with this simulation variation, in which case there is no reason to believe that the change in the level of the factor produced any change in the output value. If the variation that occurs when a factor level is changed is significantly larger than the simulation variation, then there is sufficient statistical evidence to conclude that the change in the level of the factor has caused the observed change in the output parameter.

Consider the change in NORS level vs. the observed change in operational availability as shown in the following case. Note that these values are the ones recorded in Table XII.

TABLE XII. FACTORIAL ANALYSIS WORKSHEET FOR OPERATIONAL AVAILABILITY

x_1	x_2	x_3	Yates Algorithm				Average Effect		Effect Nomenclature	
Low NORS (-)	Low Fail.Rate (-)	Low Util. (-)	Avail. Values			Effects Isolated		Value of Each Effect		Mean Square
-	-	-	70.63	131 62	253.49	485.21	$\frac{485.21}{8}$	60.65	Average Response	29428.59
+	-	-	60.99	121.87	231.72	-36.63	$\frac{-36.63}{4}$	-9.16	x_1 (NORS) Effect	167.73
-	+	-	66.90	123.77	-21.57	-25.57	$\frac{-25.57}{4}$	-6.39	x_2 (F.R.) Effect	81.73
+	+	-	54.97	107.95	-15.06	-3.05	$\frac{-3.05}{4}$	-.76	x_1 x_2 Interaction	1.16
-	-	+	65.46	-9.64	-9.75	-21.77	$\frac{-21.77}{4}$	-5.44	x_3 (Util.) Effect	59.14
+	-	+	58.31	-11.93	-15.82	6.51	$\frac{6.51}{4}$	1.63	x_1 x_3 Interaction	5.30
-	+	+	57.93	-7.15	-2.29	-6.07	$\frac{-6.07}{4}$	1.52	x_2 x_3 Interaction	4.61
+	+	+	50.02	-7.91	-.76	1.53	$\frac{1.53}{4}$	.38	x_1 x_2 x_3 Interaction	.29
Reported Center Points			55.98	58.48	54.06	57.95	Mean = 56.62%		St. Dev. = 2.016	(3 Degrees of Freedom)

Critical Values For $F_{1,3}$ is 10.1 for $\alpha = .05$ Variance For Center Points = $(2.016)^2 = 4.06$

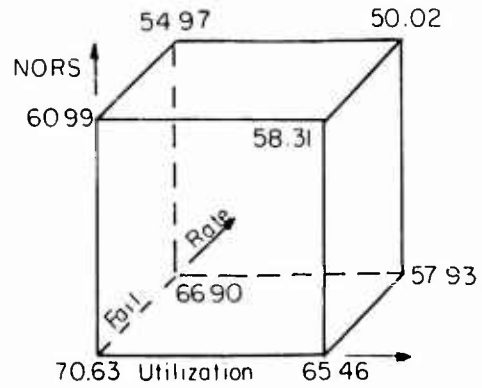

Figure 8. Observed Operational Availability Values

The Yates algorithm shown in Table XII is simply a mathematical procedure to facilitate the computation of effects. Using the availability values shown in Table XII and illustrated in Figure 8, the average effect on changing NORS level is

$$\frac{(60.99 - 70.63) + (54.97 - 66.90) + (58.31 - 65.46) + (50.02 - 57.93)}{4}$$

$$= \frac{-36.63}{4} = -9.16\% \text{ in operational availability}$$

Now the variation associated with this estimate is

$$\frac{(36.63)^2}{8} = 167.72$$

If there is no real change in operational availability caused by the change in NORS level, then this variability reflects simply the variability associated with simulation error, i.e., it is simply another estimate of simulation error.

The distribution generated by taking the quotient of two independent estimates of the same simulation error is given by the F distribution. The appropriate F distribution is dependent on the number of degrees of freedom associated with the numerator estimate and the denominator estimate.

Table XII shows that eight test points were used in generating the eight mean square values. There are eight separate bits of information used in the analysis; therefore, the data contains eight degrees of freedom. There are eight independent mean square outputs; therefore, there is one degree of freedom associated with each. In the case of the independent estimate of simulation error, there are four bits of data and therefore four degrees of freedom associated with the data; one is associated with estimating the

mean, $\bar{x}$, and the other three are associated with the estimate of error.

The NORS effect shows a variation value of 167.72 with df = 1, and the simulation variation value is 4.06 with df = 3. The $F_{1,3}$ distribution shows that at the $\alpha = .05$ level of significance, given two independent estimates of the same error, the quotient of these two estimates should not exceed 10.1.

$$\frac{167.72}{4.06} = 41.31$$

Since this exceeds 10.1, we must conclude that the deviation or difference observed in operational availability when changing from a low to a high level of NORS is not simply a manifestation of simulation error, but in actuality is a true effect caused by this change in NORS level. The best estimate of this change is a -9.16% in operational availability.

The factorial analyses are performed for the following computer output values. Significant effects are asterisked in the table showing the factorial analyses, and these effects are summarized and discussed in the main body of the report.

1) Unscheduled Elapsed Maintenance Down Hours

2) NORS Plus Unscheduled Elapsed Maintenance Down Hours

3) Percentage of Intrinsic Availability for Flight Hours Divided by Flight Hours Plus Unscheduled Down Hours

4) Percentage of Intrinsic Availability for Flight Hours Divided by Flight Hours Plus Scheduled and Unscheduled Down Hours

5) Direct Maintenance Man-Hours Per Flight Hour

6) Percentage of Mission Accomplishment

7) NORS Down Hours

Table XII has been included to show the factorial analysis in detail. Table VIII in the main body of the report summarizes the factorial analysis findings for operational availability. Tables XIII through XIX summarize the findings for each of the seven model output statistics stated above.

TABLE XIII. FACTORIAL ANALYSIS OF UNSCHEDULED ELAPSED MAINTENANCE MAN HOURS WITH NORS, FAILURE RATE, AND UTILIZATION AS FACTORS

x_1	x_2	x_3	Yates Algorithm				Average Effect		Effect Nomenclature		
Low NORS (-)	Low Fail.Rate (-)	Low Util. (-)				Effects Isolated		Value of Each Effect			Mean Square
-	-	-	4730	9511	20789	47969	[illegible]	5996	Average Response		-
+	-	-	4781	11275	27180	- 219	$\frac{-219}{8}$	- 27	x_1 (NORS) Effect		[illegible]
-	+	-	5707	12256	- 55	4435	$\frac{4435}{8}$	1109	x_2 (F.R.) Effect	**	[illegible]
+	+	-	5571	14924	- 134	311	$\frac{311}{8}$	78	x_1 x_2 Interaction		[illegible]
-	-	+	6286	51	1767	6391	$\frac{6391}{8}$	1598	x_3 (Util.) Effect	***	[illegible]
+	-	+	5970	- 136	2668	- 49	$\frac{-49}{8}$	- 12	x_1 x_3 Interaction		[illegible]
-	+	+	7371	- 316	- 187	901	$\frac{901}{8}$	225	x_2 x_3 Interaction		[illegible]
+	+	+	7553	182	- 98	685	$\frac{685}{8}$	171	x_1 x_2 x_3 Interaction		[illegible]
Reported Center Points			6989.3	6960.3	6869.5	7581.0	Mean = 7105.500		St. Dev. = [illegible]		* Degrees of Freedom

Critical Values For $F_{1,3}$: 5.54 for $\alpha = .10$; 10.1 for $\alpha = .05$; 34.1 for $\alpha = .01$

Variance For Center Points = [illegible]

** Highly Significant
*** Very Highly Significant

TABLE XIV. FACTORIAL ANALYSIS OF NORS PLUS UNSCHEDULED ELAPSED MAINTENANCE DOWN HOURS WITH NORS, FAILURE RATE, AND UTILIZATION AS FACTORS

x_1	x_2	x_3	Yates Algorithm				Average Effect		Effect Nomenclature	
Low NORS (-)	Low Fail.Rate (-)	Low Util. (-)				Effects Isolated		Value of Each Effect		Mean Square
-	-	-	19384	45973	100092	221350	$\frac{221350}{8}$	27669	Average Response	-
+	-	-	26589	54119	121258	32928	$\frac{32928}{4}$	8232	x_1 (NORS Effect	***
-	+	-	22304	53281	16716	22842	$\frac{22842}{4}$	5711	x_2 (F.R.) Effect	**
+	+	-	31815	67977	16212	2792	$\frac{2792}{4}$	698	x_1 x_2 Interaction	
-	-	+	22709	7205	8146	21166	$\frac{21166}{4}$	5292	x_3 (Util., Effect	**
+	-	+	30572	9511	14696	-504	$\frac{-504}{4}$	-126	x_1 x_3 Interaction	
-	+	+	29814	7863	2306	6550	$\frac{6550}{4}$	1638	x_2 x_3 Interaction	
+	+	+	38163	8349	486	-1820	$\frac{-1820}{4}$	-455	x_1 x_2 x_3 Interaction	
Reported Center Points			31298.8	28281.4	32390.4	31872.7	Mean = 30960.825 St. Dev. = 1841.080			Degrees of Freedom
Critical Values For $F_{1,3}$			5.54 for α = .10 10.1 for α = .05 34.1 for α = .01				Variance For Center Points = $(1841.080)^2$ = 3,389,570			

** Highly Significant
*** Very Highly Significant

TABLE XV. FACTORIAL ANALYSIS OF % INTRINSIC AVAILABILITY (FLIGHT HOURS/FLIGHT HOURS + UNSCHEDULED DOWN HOURS) WITH NORS, FAILURE RATE, AND UTILIZATION AS FACTORS

x_1	x_2	x_3	Yates Algorithm				Average Effect		Effect Nomenclature		
Low NORS (-)	Low Fail.Rate (-)	Low Util. (-)				Effects Isolated		Value of Each Effect			Mean Square
-	-	-	9.20	16.40	30.24	61.20	$\frac{61.20}{8}$	7.65	Average Response		-
+	-	-	7.20	13.84	30.96	-8.34	$\frac{-8.34}{4}$	-2.09	x_1 (NORS) Effect	***	8.69
-	+	-	7.99	17.33	-4.14	-6.26	$\frac{-6.26}{4}$	-1.57	x_2 (F.R.) Effect	**	4.90
+	+	-	5.85	13.63	-4.20	.76	$\frac{.76}{4}$	.19	x_1 x_2 Interaction		.07
-	-	+	9.94	-2.00	-2.56	.72	$\frac{.72}{4}$	.18	x_3 (Util.) Effect		.06
+	-	+	7.39	-2.14	-3.70	- .06	$\frac{-.06}{4}$	- .02	x_1 x_3 Interaction		.00
-	+	+	7.64	-2.55	- .14	-1.14	$\frac{-1.14}{4}$	- .29	x_2 x_3 Interaction		.16
+	+	+	5.99	-1.65	.90	1.04	$\frac{1.04}{4}$	.26	x_1 x_2 x_3 Interaction		.14
Reported Center Points			6.66	7.43	6.52	6.45	Mean = 6.7650, St. Dev. = .4518		(3 Degrees of Freedom)		
Critical Values For $F_{1,3}$			5.54 for α = .10 10.1 for α = .05 34.1 for α = .01				Variance For Center Points = $(.4518)^2$ = .2041				

** Highly Significant
*** Very Highly Significant

TABLE XVI. FACTORIAL ANALYSIS OF I INTRINSIC AVAILABILITY (FLIGHT HOURS/FLIGHT HOURS + UNSCHEDULED & SCHEDULED DOWN HOURS) WITH N MC, FAILURE RATE, AND UTILIZATION AS FACTORS

x_1	x_2	x_3	Yates Algorithm				Average Effect		Effect Nomenclature		
Low NORS (-)	Low Fail.Rate (-)	Low Util. (-)				Effects Isolated		Value of Each Effect			Mean Square
-	-	-	8.38	15.10	27.98	50.39	$\frac{50.39}{5}$	7.05	Average Response		-
+	-	-	6.72	12.88	22.41	-7.05	$\frac{-7.05}{4}$	-1.76	x_1 (NORS) Effect	***	6.21
-	+	-	7.37	15.78	-3.52	-5.37	$\frac{-5.37}{4}$	-1.34	x_2 (F.R.) Effect	**	3.60
+	+	-	5.51	12.63	-3.53	.47	$\frac{.47}{4}$	.12	$x_1 x_2$ Interaction		.03
-	-	+	8.94	-1.66	-2.22	.43	$\frac{.43}{4}$	.11	x_3 (Util.) Effect		.02
+	-	+	6.84	-1.86	-3.15	- .01	$\frac{-.01}{4}$	.00	$x_1 x_3$ Interaction		.00
-	+	+	7.03	-2.10	- .20	- .93	$\frac{-.93}{4}$	- .23	$x_2 x_3$ Interaction		.11
+	+	+	5.60	-1.43	.67	.87	$\frac{.87}{4}$	- .22	$x_1 x_2 x_3$ Interaction		.09
Reported Center Points			6.17	6.89	6.10	6.03	Mean = 6.2875, St. Dev. = .3999 (3 Degrees of Freedom)				
Critical Values For $F_{1,3}$			5.54 for α = .10 10.1 for α = .05 34.1 for α = .01				Variance For Center Points = $(.3999)^2$ = .1599				

** Highly Significant
*** Very Highly Significant

TABLE XVII. FACTORIAL ANALYSIS OF DIRECT MAINTENANCE MAN HOURS/FLIGHT HOUR WITH N R/S, FAILURE RATE, AND UTILIZATION AS FACTORS

x_1	x_2	x_3	Yates Algorithm				Average Effect		Effect Nomenclature		
Low NORS (-)	Low Fail.Rate (-)	Low Util. (-)				Effects Isolated		Value of Each Effect			Mean Square
-	-	-	7.67	15.67	31.47	60.65	$\frac{60.65}{8}$	7.58	Average Response		-
+	-	-	7.80	15.80	29.18	.01	$\frac{.01}{4}$	.00	x_1 (NORS) Effect		.01
-	+	-	7.91	14.10	- .09	1.11	$\frac{1.11}{4}$	.28	x_2 (F.R.) Effect	*	.19
+	+	-	7.89	15.08	.10	- .29	$\frac{-.29}{4}$	-.07	x_1 x_2 Interaction		.01
-	-	+	6.94	- .07	.13	-2.29	$\frac{-2.29}{4}$	-.57	x_3 (Util.) Effect	***	.65
+	-	+	7.16	- .02	.98	.19	$\frac{.19}{4}$	.05	x_1 x_3 Interaction		.00
-	+	+	7.60	.22	.05	.85	$\frac{.85}{4}$	.21	x_2 x_3 Interaction		.04
+	+	+	7.48	- .12	- .34	- .39	$\frac{-.39}{4}$	-.10	x_1 x_2 x_3 Interaction		.01
Reported Center Points			7.69	7.95	7.77	7.65	Mean = 7.7650, St. Dev. = .13300				3 Degrees of Freedom
Critical Values For $F_{1,3}$			5.54 for α = .10 10.1 for α = .05 34.1 for α = .01				Variance For Center Points = $(.13300)^2$ = .01769				

* Significant
*** Very Highly Significant

TABLE XVIII. FACTORIAL ANALYSIS OF [illegible] MISSION ACCOMPLISHMENT (MISSIONS COMPLETED/MISSIONS CALLED) WITH NORS, FAILURE RATE, AND UTILIZATION AS FACTORS

x_1	x_2	x_3	Yates Algorithm				Average Effect		Effect Nomenclature	
Low NORS (-)	Low Fail.Rate (-)	Low Util. (-)				Effects Isolated		Value of Each Effect		Mean Square
-	-	-	97.33	193.08	386.37	771.88	$\frac{771.88}{8}$	96.49	Average Response	-
+	-	-	95.75	193.29	385.51	- 1.50	$\frac{-1.50}{4}$	- .38	x_1 (NORS) Effect	.28
-	+	-	95.93	193.74	- .15	- 1.76	$\frac{-1.76}{4}$	- .44	x_2 (F.R.) Effect	.39
+	+	-	97.36	191.77	- 1.35	2.18	$\frac{2.18}{4}$	.55	x_1 x_2 Interaction	.61
-	-	+	97.30	- 1.58	.21	- .86	$\frac{-.86}{4}$	- .22	x_3 (Util.) Effect	.09
+	-	+	96.74	1.43	- 1.97	- 1.20	$\frac{-1.20}{4}$	- .30	x_1 x_3 Interaction	.18
-	+	+	96.43	- .26	3.01	- 2.18	$\frac{-2.18}{4}$	- .55	x_2 x_3 Interaction	.61
+	+	+	95.34	- 1.09	- .83	- 3.84	$\frac{-3.84}{4}$	- .96	x_1 x_2 x_3 Interaction *	1.84
Reported Center Points			96.09	96.77	97.01	96.17	Mean = 96.5100, St. Dev. = .4508		3 Degrees of Freedom	
Critical Values For $F_{1,3}$			5.54 for α = .10 10.1 for α = .05 34.1 for α = .01				Variance For Center Points = $(.4508)^2$ = .2032			

* Significant

TABLE XIX. FACTORIAL ANALYSIS OF WORK HOURS WITH WORK COMPLEXITY, WAITING TIME, FAILURE RATE, AND UTILIZATION AS FACTORS

x_1	x_2	x_3	Yates Algorithm				Average Effect		Effect Nomenclature	
Low WORK (-)	Low Fail.Rate (-)	Low Util. (-)				Effects Isolated		Value of each Effect		Mean Square
-	-	-	17158	43175	97954	210169	$\frac{210169}{8}$	26271	Average Response	-
+	-	-	26017	54779	112215	39551	$\frac{39551}{4}$	9888	x_1 (WORK) Effect ***	[illegible]
-	+	-	20613	49174	22412	25471	$\frac{25471}{4}$	6368	x_2 (F.R.) Effect **	[illegible]
+	+	-	34166	63041	17139	2761	$\frac{2761}{4}$	690	x_1 x_2 Interaction	[illegible]
-	-	+	19819	8859	11604	14261	$\frac{14261}{4}$	3565	x_3 (Util.) Effect	[illegible]
+	-	+	29355	13553	13867	-5273	$\frac{-5273}{4}$	-1318	x_1 x_3 Interaction	[illegible]
-	+	+	27719	9536	4694	2263	$\frac{2263}{4}$	566	x_2 x_3 Interaction	[illegible]
+	+	+	35322	7603	-1933	-6627	$\frac{-6627}{4}$	-1657	x_1 x_2 x_3 Interaction	[illegible]
Reported Center Points			29774.8	27571.2	32641.9	28698.8	Mean = 29671.675 St. Dev. = 2174.960 (3 Degrees of Freedom)			

Critical Values For $F_{1,3}$: 5.54 for $\alpha = .10$; 10.1 for $\alpha = .05$; 34.1 for $\alpha = .01$

Variance For Center Points = $(2174.960)^2$ = 4,730,451

** Highly Significant
*** Very Highly Significant

LIST OF SYMBOLS AND ABBREVIATIONS

α	level of significance
θ	mean of distribution
σ	standard deviation of distribution
A/C	aircraft
act.	action
admin.	administrative
AFCS	automatic flight control system
APP	auxiliary power plant
avail.	availability
coll.	collective
cont.	control
corr.	corrective
cum.	cumulative
discrep.	discrepancy
EAPS	engine air particle separator
EMT	elapsed maintenance time
eng.	engine
flt.	flight
F.R.	failure rate
GSE	ground support equipment
HS	highly significant
hyd.	hydraulic
IGB	intermediate gearbox
Insp.	inspection
land	landing

LIST OF SYMBOLS AND ABBREVIATIONS (CONTINUED)

lat.	lateral
L.H.	left hand
Lt.	left
M.A.	maintenance action
Math.	mathematical
Mech.	mechanism
M.G.B.	main gearbox
M.L.G.	main landing gear
MMH	maintenance man-hours
MMH/FH	maintenance man-hours per flight hour
MOS	military occupational speciality
MR	main rotor
MRH	main rotor head
MTBF	mean time between failures
MTBMA	mean time between maintenance actions
MTBR	mean time between removals
MTTR	mean time to repair
No.	number
NORM	not operationally ready - maintenance
NORS	not operationally ready - spares
ORME	operations reliability/maintainability engineering program
PMD	preventive maintenance - daily inspection
PMI	preventive maintenance - intermediate inspection
PMP	preventive maintenance - periodic inspection
Press.	pressure

Prevent.	preventive
Prim	primary
Prob.	probability
Pwr.	power
R&M	reliability and maintainability
Req.	required
Rec.-Trans	receiver - transmitter
R.H.	right hand
Rt.	right
R&R	remove and replace
S	significant
Sta.	station
Stabil.	stabilizer
St. Dev.	standard deviation
Tach.	tachometer
TBO	time between overhauls (scheduled)
Tech.	technician
TOE	table of organization and equipment
T.R.	tail rotor
Trans.	transmission
Util.	utility
VHS	very highly significant
W.C.	work center