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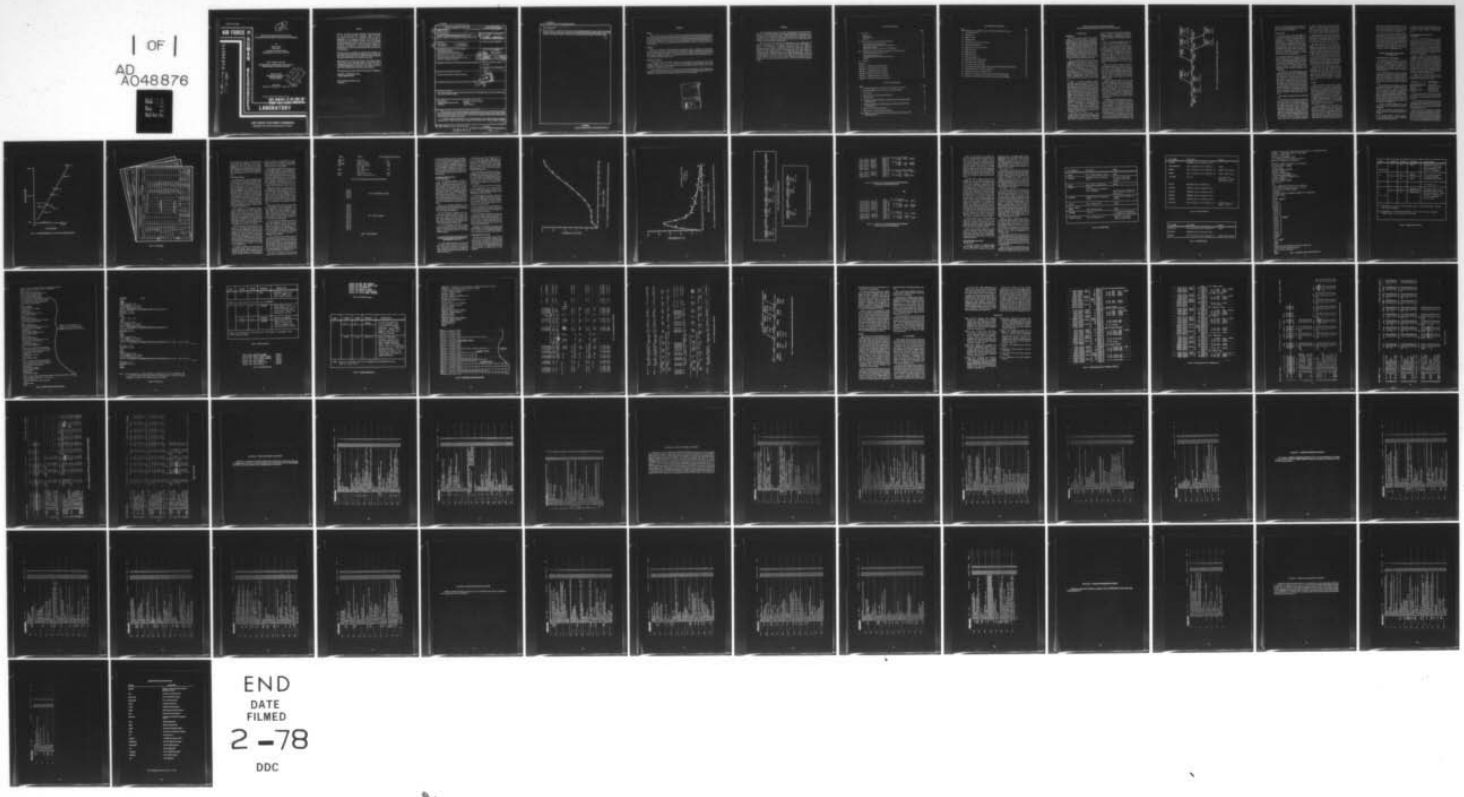

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AIR FORCE HUMAN RESOURCES LABORATORY

PREDICTING POWERED SUPPORT EQUIPMENT AND ASSOCIATED MAINTENANCE MANPOWER REQUIREMENTS

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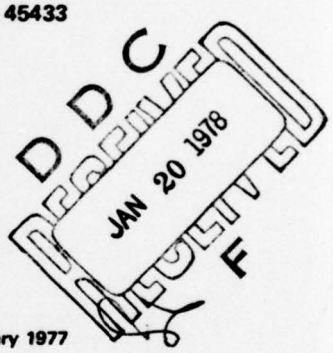

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This final report was submitted by Advanced Systems Division, Air Force Human Resources Laboratory, Wright-Patterson Air Force Base, Ohio 45433, under project 1124, with HQ Air Force Human Resources Laboratory (AFSC), Brooks Air Force Base, Texas 78235.

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This technical report has been reviewed and is approved for publication.

GORDON A. ECKSTRAND, Director
Advanced Systems Division

DAN D. FULGHAM, Colonel, USAF
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There is a need for a more responsive method for predicting the ground support equipment (SE) requirements and the related SE maintenance manpower requirements associated with newly developing weapon systems. A study was conducted whose purpose was to develop such a method by first establishing the basic analytical rationale, and then by creating a users' guide for the method.

A computer program was developed from an existing maintenance data collection program. It processes maintenance data on operational SE in order to produce the information needed to conduct a Logistics Composite

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Model simulation of proposed SE work centers for newly developing aircraft. Primary inputs are the standard 6-month maintenance tapes kept at base level, and completed AF Forms 864 which provide records of SE utilization. The program is currently in operation on the Aeronautical Systems Division's CDC 6600 computer.

SUMMARY

Problem

There is a need for a more responsive method for predicting the ground support equipment (SE) requirements and the related maintenance manpower requirements for aircraft systems during development. This method should provide early estimates for use in trade-offs and evaluations, and should be sensitive to the operational requirements of the aircraft. This report addresses a study effort whose purpose was to develop such a method by first establishing the basic analytical rationale, and then by creating a users' guide for the method.

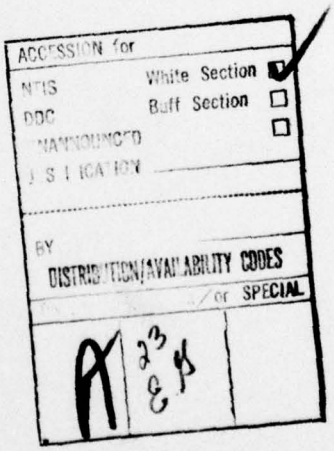
Approach

With the cooperation of many people and organizations involved in Logistics Composite Model (LCOM) studies, the necessary relationships between manpower, support requirements, and operational scenario were identified and verified. A computer program was developed from an existing maintenance data collection program to produce the information needed to conduct a LCOM simulation study of proposed support equipment work centers.

Results and Conclusions

The programs and methodologies developed were successfully used to simulate an A-7 powered support equipment work center, and to perform trade-offs between related manpower and support equipment requirements. It was demonstrated that this methodology provides the analyst with a next generation tool for addressing these factors.

This methodology has also been used to support the F-16 support equipment and the AMST support equipment LCOM simulation studies conducted by the Directorate of Equipment Engineering, Deputy for Engineering, Aeronautical Systems Division, Wright-Patterson Air Force Base, Ohio.



PREFACE

The methodology described in this report was developed by the Advanced Systems Division, Air Force Human Resources Laboratory, Wright-Patterson Air Force Base, Ohio. The effort was documented under task 11240405, Adaptation of Operations Research Techniques to Air Force Human Resources Problems, with Mr. Frank Maher as task scientist. Dr. Ross L. Morgan is project scientist for project 1124, Human Resources in Aerospace System Development and Operations.

The study effort was supported by individuals from many organizations. In addition to the listed authors, they include Lt Col Donald Tetmeyer and Mr. William D. Moody of the Directorate of Equipment Engineering, Deputy for Engineering, Aeronautical Systems Division, Wright-Patterson Air Force Base, Ohio; TSgt N. A. Meireis, and TSgt Samuel Stevens of the Maintenance and Supply Management Engineering Team, Wright-Patterson Air Force Base, Ohio; Mr. Tom Cuff of the Aeronautical Systems Division Computer Center; MSgt Ward, MSgt Witchby, SSgt Ward and SSgt Robbins of the Myrtle Beach Air Force Base, South Carolina, A-7 powered support equipment work center; and Ms. Linda K. Hammen of the Advanced Systems Division, Air Force Human Resources Laboratory, who did the final draft typing and editing.

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I. INTRODUCTION

Background

This report outlines efforts which address weapon system maintenance manpower requirements as a function of support equipment (SE) requirements and operational requirements. Support equipment (SE) was previously referred to as aerospace ground equipment (AGE). The Logistics Composite Model (LCOM) has been used successfully in the recent past to accurately predict maintenance manpower requirements for the weapon systems themselves. This study addresses the feasibility of using LCOM to predict the maintenance manpower requirements for the SE; and then to determine the influence of the numbers and types of SE upon manpower requirements.

The term LCOM has gained wide acceptance throughout the Air Force as a reference to all LCOM related models. However, the LCOM model itself is just one of three or four models that can be used in a LCOM study. For this technical report, the term LCOM will refer to the LCOM model itself; the term MMM (Maintenance Manpower Models) will refer to all LCOM associated models. A full discussion of these models may be found in AFHRL-TR-74-97, Volumes I through VI. The full list and description of these models are:

1. *LCOM* – A computer simulation program based upon queuing processes and network analysis. When used for simulating a weapon system, branching networks are developed which represent the maintenance and flying activities associated with an operational scenario. The individual tasks within these networks have average completion times and completion time standard deviations. In addition, the servicing and maintenance tasks also demand specific manpower and SE resources. There are two types of maintenance activities represented by the networks: scheduled and unscheduled. The simulation of a given unscheduled activity is controlled by a clock associated with that activity. The clocks are set individually for the unscheduled activity to be simulated based upon the distribution parameters (mean, standard deviation) of the number of sorties between the unscheduled activity of interest.

2. *Maintenance Data Collection (MDC)* – These programs process weapon system maintenance data recorded in accordance with AF TO 00–20. The data are recorded on Air Force Technical Order (AFTO) Form 349 and then transferred to magnetic computer tapes designated ABD64-A. The MDC programs use ABD64-A tapes for input. Output provides data for the LCOM branching networks.

3. *Phase I* – This program processes input data for ready acceptance into the LCOM program.

Figure 1 is a typical LCOM branching network showing the various paths the courses of action may take, and also showing the supporting data. *The development of a complete set of such networks which would reflect all relevant operational activities is usually considered the climax of an LCOM study.* However, this is by no means a routine accomplishment. For example, there are approximately 300 such networks needed for an up-to-date LCOM simulation of the A-7 weapon system.

The network, depicted in Figure 1, deals with unscheduled maintenance on the gas turbine engine which is on the AM32-60 SE. This network presents task names (AAAE00), occurrence probabilities (e), personnel (AFSCs) required (423X5), mean task times (T), and SE (D-60) required for each task. Much of this type of data is usually obtained from the maintenance data collection (MDC) programs.

Although network development is the high point of an LCOM study, there would still remain much to be accomplished after this. Manning and SE requirements and/or associated sensitivity studies would come afterward. The LCOM model itself may be thought of as a mechanical tool which processes the network information in order to project final manning/SE recommendations. However, the utilization of the LCOM model is rote compared to the research required to develop the networks.

The MDC model was developed to process aircraft maintenance data. However, SE maintenance data are recorded on the ABD64-A tape also. It appeared feasible to obtain initial network insight and information for a proposed SE operational work center by processing this SE MDC data via the MDC model. The acquisition of this network information would bring closer to reality the LCOM simulation of a proposed SE work center for a newly developing weapon system. As is the case for weapon system network development, this initial SE network insight and information would

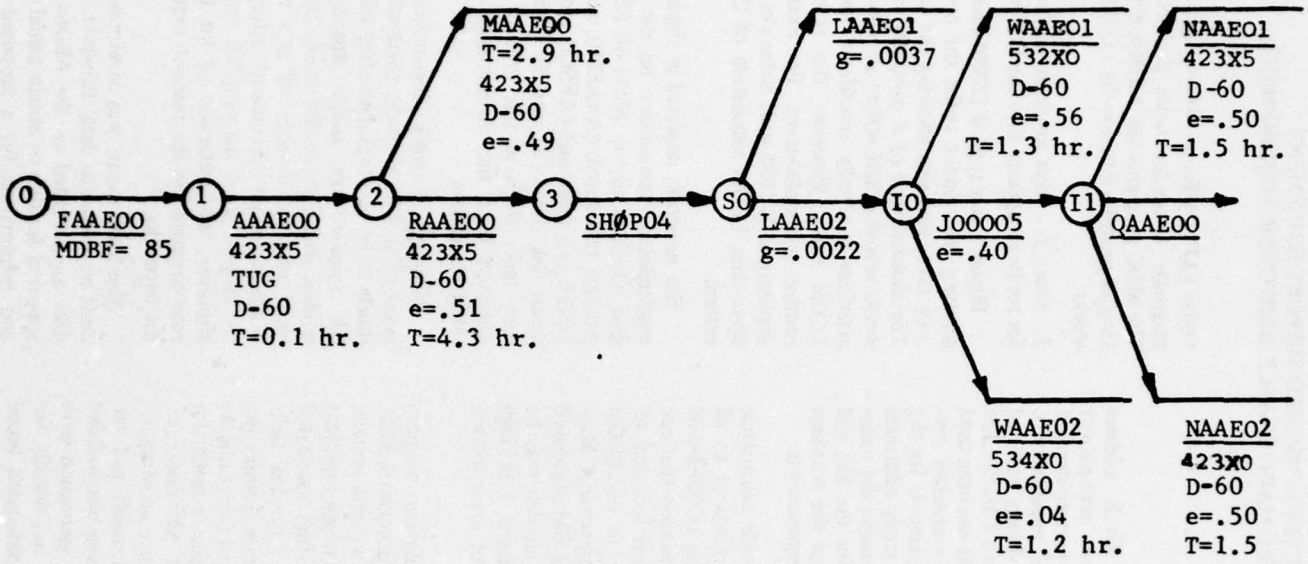


Figure 1. **Unscheduled maintenance, AM32-60 gas turbine engine, task networks.**

need to be discussed, adjusted, and verified via visits to the various SE operational work centers from whence came the MDC data.

Study Approach

It was first necessary to assure that MDC data for SE could be processed through the MDC programs with no more than a reasonable amount of modification to the programs needed. Second, a thorough study of typical powered SE work centers at Myrtle Beach AFB, South Carolina, and at Wright-Patterson AFB, Ohio, was completed before attempting to model an SE work center via the MMM models. Third, several modeling techniques were investigated in order to further identify and clarify the optimum manner in which an SE work center may be simulated.

New computer programs to process the MDC SE maintenance data were developed. This was done by modifying the existing MDC programs. The new programs process this data so that the SE network data for unscheduled maintenance activities are outputted in the same manner that the original programs outputted aircraft data. Appendices A thru F present the listings of these new programs.

Visits were made to the Wright-Patterson AFB powered SE work center and to the Myrtle Beach AFB powered SE work center to obtain insight into their system of operations and also to ascertain whether or not the centers would lend themselves to MMM modeling with only a reasonable amount of model revision. It was discovered that maintenance activities on SE are recorded in a very similar manner to that in which aircraft maintenance activities are recorded (i.e., in accordance with AF TO 00-20-2). The dispatching activity of SE was studied, and relationships were noted between SE dispatch activity and aircraft sortie rates.

The modeling was approached in two different ways:

1. *First Approach:* The networks and supporting data were developed for the SE work center in the same manner that they are usually developed for the parent weapon system; that is, by processing the ABD64-A tape data in order to gain initial insight and supporting information concerning the unscheduled maintenance networks. These networks were then verified by discussing them with skilled and experienced maintenance personnel at the work centers. Next the SE work centers' activities (dispatch rates by equipment type and number, and dispatch durations) were investigated in order to develop a work center scenario which "drives" the LCOM simulation model in the same manner that a weapon system's activities (sortie rate by aircraft type and number, and sortie durations) "drive" a weapon system LCOM simulation.

2. *Second Approach:* The SE networks and supporting data developed per the *first approach* were incorporated into the parent weapon system's (in this case the A-7) LCOM model so that the weapon system's scenario drove the simulation.

An initial LCOM model of the A-7D had previously been constructed at Advanced Systems Division, Air Force Human Resources Laboratory (AFHRL), Wright-Patterson AFB, Ohio. This model was updated, expanded and revalidated by AFHRL personnel and by maintenance specialists at Myrtle Beach AFB. The SE work center networks were first developed for an LCOM simulation of the Myrtle Beach SE work center per the *first approach*. Various simulations were accomplished in order to determine the relationships between SE maintenance manpower requirements, operational requirements, and SE requirements.

These SE work center networks were then incorporated into the A-7D LCOM model in accordance with the *second approach*. It was found that the *second approach* was more accurate than the *first approach*. However, the *first approach* is much less demanding in terms of run time, complexity and turn around time; and therefore, lends itself more readily to sensitivity analysis.

Overview

Section II outlines the revised MDC program development. Also, the feasibility of simulating an SE work center using LCOM is established. Significant data and data analysis results which support this feasibility contention are also presented. *A review and familiarity with Sections I through IV of AFHRL-TR-74-97(III) (which documents the original MDC program) are recommended in order to obtain a full understanding of the analytical rationale presented. Review is also recommended for the individual who intends to use this revised MDC program for processing SE data.*

A full-scale MMM study of a powered SE work center for the AM32-60 Generator and the NF-2 Light Stand is addressed in Section III. These two pieces of SE were used to exemplify, and further verify the proposed modeling techniques developed during this study. Sensitivity analyses were performed for: (a) maintenance and servicing manpower requirements, (b) SE requirements, and (c)

operational requirements. *Section III is also intended as the user's portion of this report. All of the information required of a user's guide to the proposed modeling techniques is in Section III.*

Section IV outlines the conclusions and insights obtained from this study. It was concluded that SE dispatching activity was directly related to servicing, pickup and delivery, and unscheduled maintenance manhours. The other factors driving SE maintenance are the total number and different types of SE possessed by the work center. A final insight gained was that an SE work center can be modeled as a system in itself and that this system modeling lends itself to MMM application.

II. MODEL DEVELOPMENT, PROGRAMMING AND VERIFICATION

Powered SE Work Center Description

SE branches are composed of three work centers: (a) management, (b) repair and inspection, and (c) servicing/pickup and delivery. Of these three only two, repair and inspection and servicing/pickup and delivery actually perform AFTO Form 349 reportable work in accordance with AF TO-00-20.

The work centers have a mission of satisfying demands for SE initiated by aircraft servicing and unscheduled maintenance. To complete these SE missions, SE is dispatched to parked aircraft and returned again after use. This dispatching activity may involve several types of SE over a 24-hour period.

After an SE mission, the equipment is serviced and operationally checked. If found operative, the equipment is returned to a ready line. If inoperative, it is placed in a waiting for maintenance status until parts and manpower are available for repair. A scheduled maintenance activity called a periodic inspection (PE) is also performed on the SE. This maintenance task is similar to an aircraft phase inspection. A typical PE may consist of 16 man-hours of maintenance performed twice a year on a given piece of equipment.

In order to attempt an MMM effort of an SE work center, the following questions must first be investigated:

1. What are the factors which significantly influence SE failures and likewise SE maintenance activities?

2. Are the data available, or feasibly attainable, for the branching networks which outline the unscheduled maintenance on SE?

3. What are the factors which influence the operational scenario of an SE work center, and are the supporting data available or feasibly attainable?

Criteria Influencing SE Maintenance Requirements

In order to attempt SE modeling, the failure factor(s) that cause SE to fail must be determined. The hypothesis concerning SE is that the flying schedule generates unscheduled SE maintenance. That is, as the sortie rate for a given unit equipment (UE) configuration increases, demands on the SE increase; similarly as demands on SE increase, unscheduled maintenance in the SE branch increases. This hypothesis is supported by two independent investigations.

Figure 2 is a plot of A-7D sorties/month vs. SE unscheduled maintenance man-hours (MMH) expended furing the corresponding month. The data in Figure 2 were obtained from Myrtle Beach AFB. Two unique factors enabled the analysis to be made. First, the A-7D is the major aircraft system present at Myrtle Beach which relates SE maintenance directly to the aircraft's demand for SE (also noted that a linear relationship exists). Secondly, during the months shown, the A-7D experienced a broad range flying schedule.

A further look at the Myrtle Beach SE work center allows the work in the SE branch to be divided into the following five activities.

Activity	Work Generator
Unscheduled Maintenance	Aircraft Sorties
Periodic Inspection	Equipment on Hand
Servicing	Aircraft Sorties
Pickups and Delivery	Sorties/Distances
Supervision	Work Center Size

The work generators were determined through observations of the work center's operations and by discussions with experienced work center personnel.

It is noted that the SE maintenance activities of major interest are generated by aircraft sorties, which adds further verification to the contention that aircraft sortie rate is the prime factor influencing maintenance on SE.

The next task was to establish a relationship between aircraft sorties and SE demands. This consisted of determining an SE demand per sortie for the weapon system of interest and for each type of SE in the work center. Data were obtained from AF Form 864 (Daily Requirement and Dispatch Record) (Figure 3) maintained by Job Control or

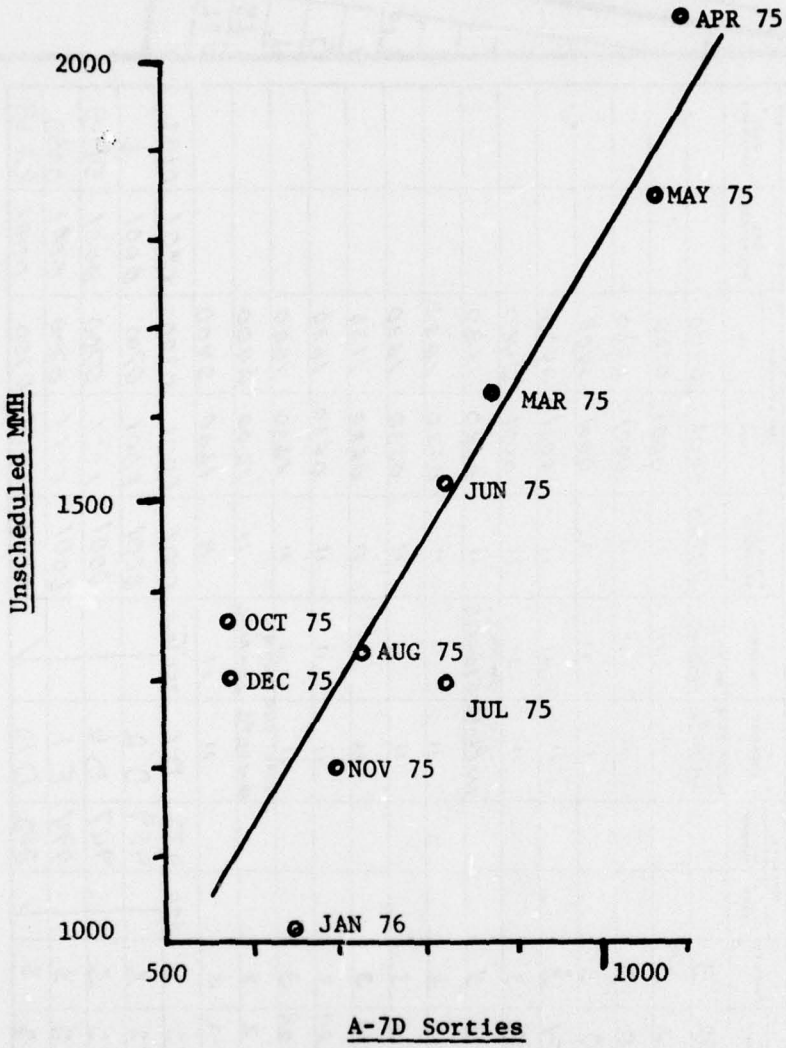
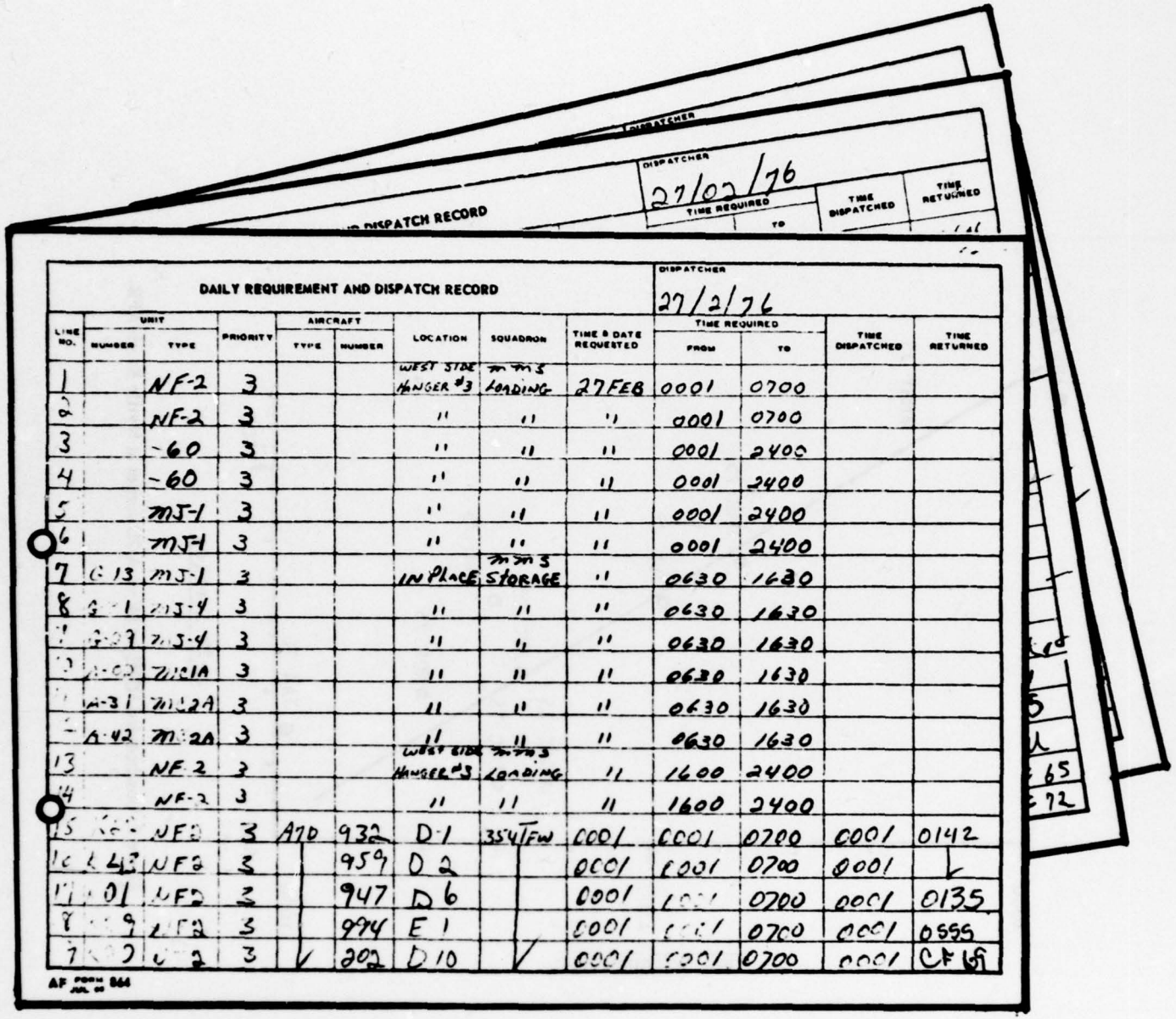


Figure 2. **Unscheduled MMH on SE vs. A-7D sorties at Myrtle Beach AFB.**



DAILY REQUIREMENT AND DISPATCH RECORD

DISPATCHER 27/2/76

LINE NO.	UNIT NUMBER	UNIT TYPE	PRIORITY	AIRCRAFT TYPE	AIRCRAFT NUMBER	LOCATION	SQUADRON	TIME & DATE REQUESTED	TIME REQUIRED FROM	TIME REQUIRED TO	TIME DISPATCHED	TIME RETURNED
1		NF-2	3			WEST SIDE HANGER #3	354 TFS LOADING	27FEB	0001	0700		
2		NF-2	3			"	"	"	0001	0700		
3		-60	3			"	"	"	0001	2400		
4		-60	3			"	"	"	0001	2400		
5		MJ-1	3			"	"	"	0001	2400		
6		MJ-1	3			"	"	"	0001	2400		
7	G-13	MJ-1	3			IN PLACE	354 TFS STORAGE	"	0630	1630		
8	G-1	MJ-4	3			"	"	"	0630	1630		
9	G-9	MJ-4	3			"	"	"	0630	1630		
10	A-09	MJ-1A	3			"	"	"	0630	1630		
11	A-31	MJ-2A	3			"	"	"	0630	1630		
12	A-42	MJ-2A	3			"	"	"	0630	1630		
13		NF-2	3			WEST SIDE HANGER #3	354 TFS LOADING	"	1600	2400		
14		NF-2	3			"	"	"	1600	2400		
15	[illegible]	NF-2	3	A7D	932	D-1	354 TFW	0001	0001	0700	0001	0142
16	L-43	NF-2	3		959	D 2		0001	0001	0700	0001	↓
17	01	NF-2	3		947	D 6		0001	0001	0700	0001	0135
18	9	NF-2	3		994	E 1		0001	0001	0700	0001	0555
19	[illegible]	NF-2	3	✓	202	D 10	✓	0001	0001	0700	0001	CF 65

AF FORM [illegible] 864

Figure 3. **AF Form 864.**

the SE Branch, and compared with sorties flown for the same time periods to arrive at these demands rates per sortie. Figure 4 summarizes demands per sortie for various pieces of SE at Myrtle Beach. These demand rates per sortie are quite significant for LCOM networking because they are the same as the occurrence probability that a particular piece of SE will be needed for a sortie.

MDC Program Revision

It was necessary to obtain unscheduled maintenance data on SE equipment in a manner similar to that whereby aircraft unscheduled maintenance data are obtained; and then establish SE component failure rates per sortie. An investigation into the availability of a data base for SE revealed that the maintenance data collection system contained data suitable for networking purposes. The data base, however, is different from aircraft data in several respects. Contained on every ABD69A tape obtained from base level are AFTO Form 349 records of every piece of equipment worked on at this location. To avoid the cumbersomeness of making individual runs on individual equipment types it is necessary to sort SE records into like units before processing through a modified version of the aircraft data base run.

The procedure for distinguishing between various equipment types is in some cases straightforward and in other cases quite complex. For engine or motor driven generators (Federal Stock Class 6115) and munitions handling equipment, identification is straightforward. These equipment types can be identified by the equipment class code (EQ/CL) found in the same position on the AFTO Form 349 records as the mission design series (MDS) for an aircraft (see TO-00-20-2).

All other SE such as hydraulic mules, air conditioners, air compressors, light stands and others are not so easily distinguished. Equipment class codes in this area do little more than separate the equipment into general categories. For example, hydraulic test stands fall under equipment class code AE. This code signifies a class of equipment known as Inspection and Maintenance Equipment. This class includes large work stands, engine stands and hydraulic mules. Obviously this does not help in the construction of a network for a specific type of hydraulic mule.

To identify a particular type of SE such as the TTU-228E hydraulic mule, the National Item Identification Number (NIIN) designator must be utilized. The NIIN designator is a three-digit alphanumeric character that is part of the registration number of every piece of registered SE. An equipment type such as a TTU-228E may have several NIINs that need to be obtained so that all like equipment can be processed together.

It is necessary to obtain from the work center a list of all NIINs that pertain to the particular piece of SE in question. Figure 5 gives the NIINs for all the TTU-228E Hydraulic Mules, and for all the NF-2 Light Stands at Myrtle Beach AFB. This is necessary if maintenance data are to be processed on these pieces of SE. This list may be compiled from information obtained from the TO 35-1 series, *Application of AF Registration Numbers*; or it may be obtained from the work card for the particular piece of equipment at the work center.

Besides the difference in the use of equipment class codes, there are some other differences in the records. The most obvious difference is the work unit code scheme. All SE equipment work unit codes can be found in either TO-0025-06-2-2 or TO 35C2-3-1-06. The work unit codes are 5-digit alphanumeric codes. Because the first two characters are always alpha, the data base programs had to be modified to accommodate this difference.

Other codes contained on the record are similar to codes utilized by aircraft maintenance. The How Malfunctioned codes are identical to the codes utilized for aircraft maintenance. Action Taken codes are also identical. The Type Maintenance and When Discovered codes are slightly different. This difference in these two codes must be accounted for to make proper modification to the data base processing programs.

To accommodate the difference in the SE data base some modifications of the MDC program were required. The entire listings for all programs, unique or modified for SE processing, are contained in the appendices. The major changes to the data base processing scheme was the introduction of the pre-processor, modification to GETDATA, now GETAGE, and the modification of COMBINE, now COMBAGE.

The pre-processor is a new program required to select and sort only those pieces of equipment required for networking. The pre-processor provides the user with the ability to select by card input those equipment class codes and NIIN designators desired. The pre-processor then inputs these separate SE files into the data base programs to be processed sequentially by rewinding the data base program tapes while files are resident in core.

The GETAGE program is a result of modifications made to accommodate the differences in

Type	Name	A-7D Demand Rate/Sortie
AM32-60	Generator	1.27
NF-2	Light Stand	1.06
TTV228E	Hydraulic Mule	.045
MC1	Air Compressor (Hi Pac)	.090
MC2A	Air Compressor (Lo Pac)	.080
MJ-1	Bomb Lift Truck	.080
MB-1	Cabin Leakage Tester	.032

Figure 4. **Powered support equipment demand rate/sortie.**

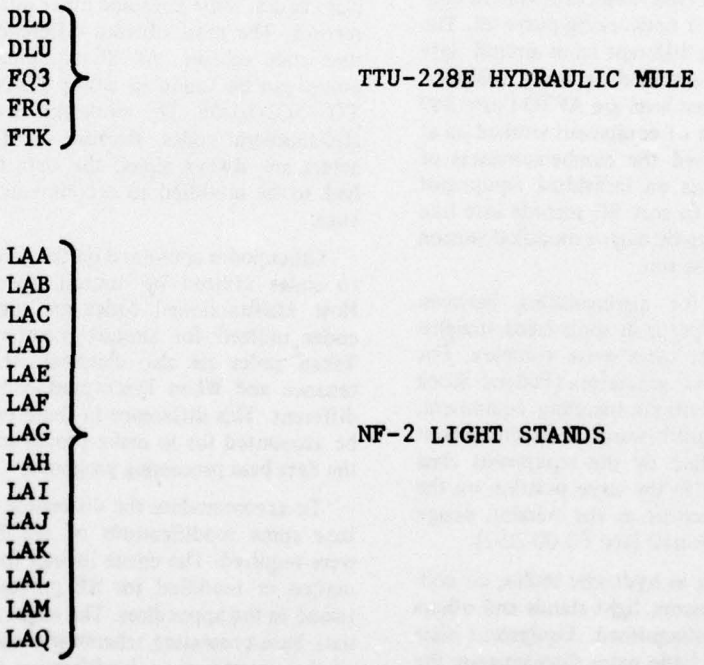


Figure 5. **NIIN equipment.**

the data base as discussed previously. The addition of a service file was the major change with respect to the user. Because most maintenance in the SE branch is done within a relatively small work area, the general support codes (01000 to 09000) take on more significant meaning. Such codes as 03114 (Periodic) provide meaningful information to those concerned with SE maintenance. Thus, these general support codes have been included in the processing runs.

Adaptability of SE Work Centers for the LCOM Models

The first modeling technique outlined in Section I, whereby only the SE work center is simulated, requires an operational scenario for the SE work center. That is, a description of SE missions, duration, and departure times must be estimated. AF Form 864 (see Figure 3) is a source for such data. Figure 6 is a cumulative probability distribution for the dispatch of AM32-60s at Myrtle Beach during the spring of 1976. Figure 6 was produced from data obtained from AF Forms 864, other such illustrations for other pieces of SE could likewise be produced. Such distributions are input into the LCOM model to generate departure times.

Figure 7 is a probability distribution of the AM32-60 dispatch durations. This distribution was also plotted from data obtained from AF Forms 864, and is needed as LCOM input.

The data depicted in Figures 6 and 7 are needed only for simulation of an SE work center per the *first approach* outlined in Section I. In such cases, dummy sorties are generated which then generate demands for various types of SE. These demands would reflect the dispatch times and durations depicted in Figures 6 and 7.

If the SE maintenance networks are incorporated into the parent weapon system's LCOM model in accordance with the *second approach*, dispatch times and durations for SE are automatically generated.

III. PREDICTING POWERED SE REQUIREMENTS VS. MANPOWER REQUIREMENTS AND OPERATIONAL REQUIREMENTS FOR THE A-7D

A full-scale MMM simulation of a powered SE work center for the AM32-60 Generator and the NF-2 Light Stand is addressed in this section. These two pieces of SE are used to exemplify and further verify the proposed modeling techniques outlined in Section II.

The scenario used reflects the support of a 72 UE A-7D wing flying about 1,000 hours per month. To support this operation and deployment requirement, 24 AM32-60s (–60) were on hand. The NF-2 was selected because it was utilized almost as heavily as the –60. The NF-2 provides night lighting and 120 volts AC power for support of flight line maintenance.

Both approaches as described in Section I, paragraph B are exemplified. In order to conduct an LCOM study using either the *first approach* or the *second approach*, all information that would be required to process the original MDC program is needed. (See Section IV of AFHRL-TR-74-97(III)). In addition the following information is needed:

1. Support equipment work unit code manuals.

2. The equipment class code for SE pieces that are of Federal Stock Class 6115 (motor driven generators or munitions handling equipment). (See TO-00-20-2 or TO 35C2-3-1-06.)

3. The NIIN designator for pieces of SE other than those classified as Federal Stock Class 6115. (See TO 35-1), *Application of Air Force Registration Numbers.*) The NIINs may also be obtained from the work card for the particular piece of equipment at the work center.

4. A set of completed AF Forms 864 (Figure 3) for the 6-month period of interest. These forms are obtained from Job Control or the SE Branch at the operational unit of interest.

5. The unscheduled maintenance networks are obtained by processing the SE data obtained from the ABD64-A tapes through the MDCAGE programs in order to obtain initial insight and information for these networks. These networks are then verified by discussion with experienced maintenance personnel in the field.

Paragraph A and Figures 8 through 10b of this section apply to the *first approach*. Paragraphs B and C and the rest of the illustrations apply to both the *first approach* and the *second approach*.

Main Dispatch Network for SE

Dispatch times and dispatch duration distributions, means, and standard deviations were developed from completed AF Forms 864 (Figure 3). As mentioned in Section II, Figures 6 and 7 present these data. In the dispatching network, the –60 and the NF-2 are "used" based upon their average utilization (or dispatch) time, not operating time.

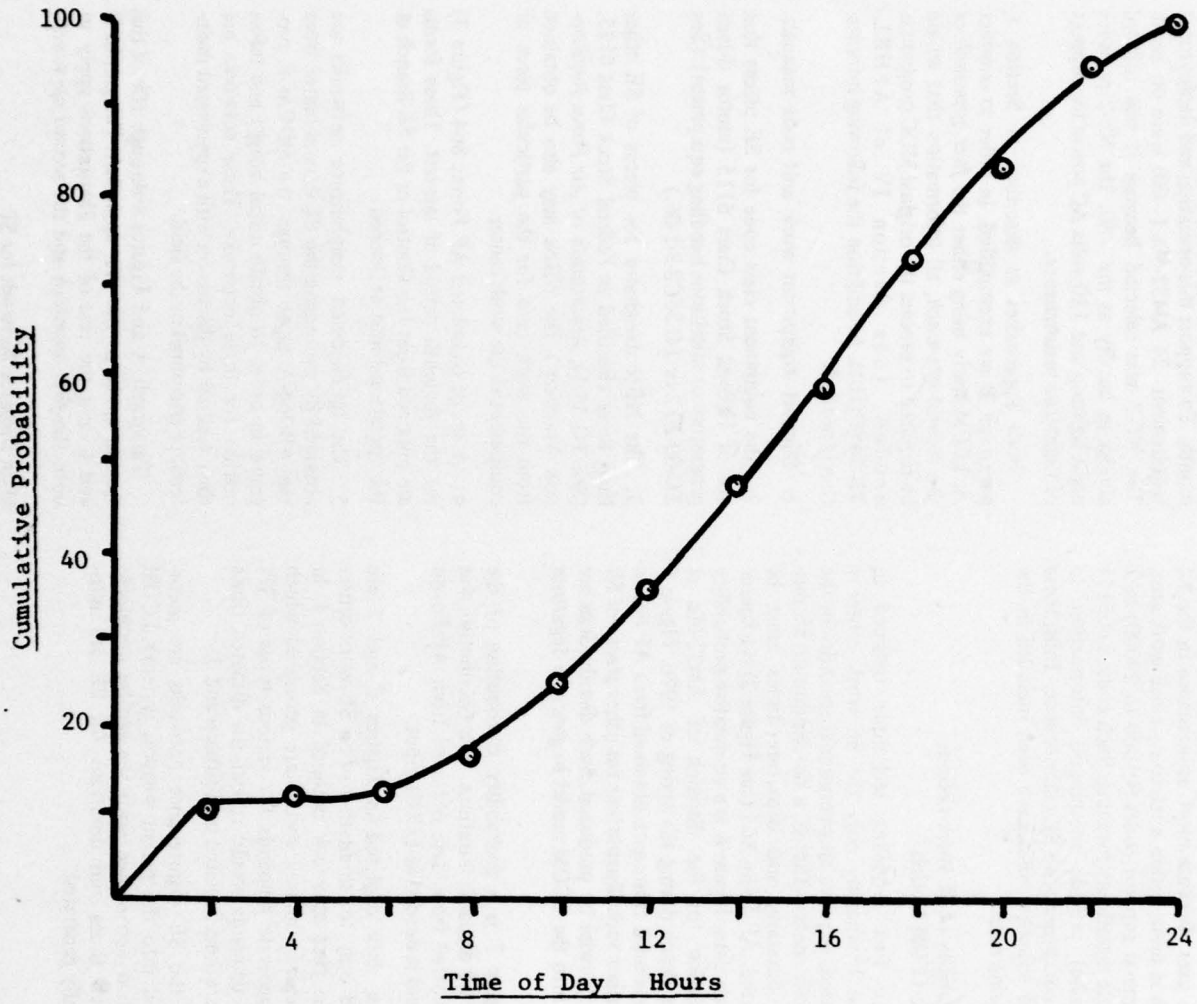


Figure 6. **Cumulative probability distribution of AM32-60 dispatch times Myrtle Beach AFB, spring 1976.**

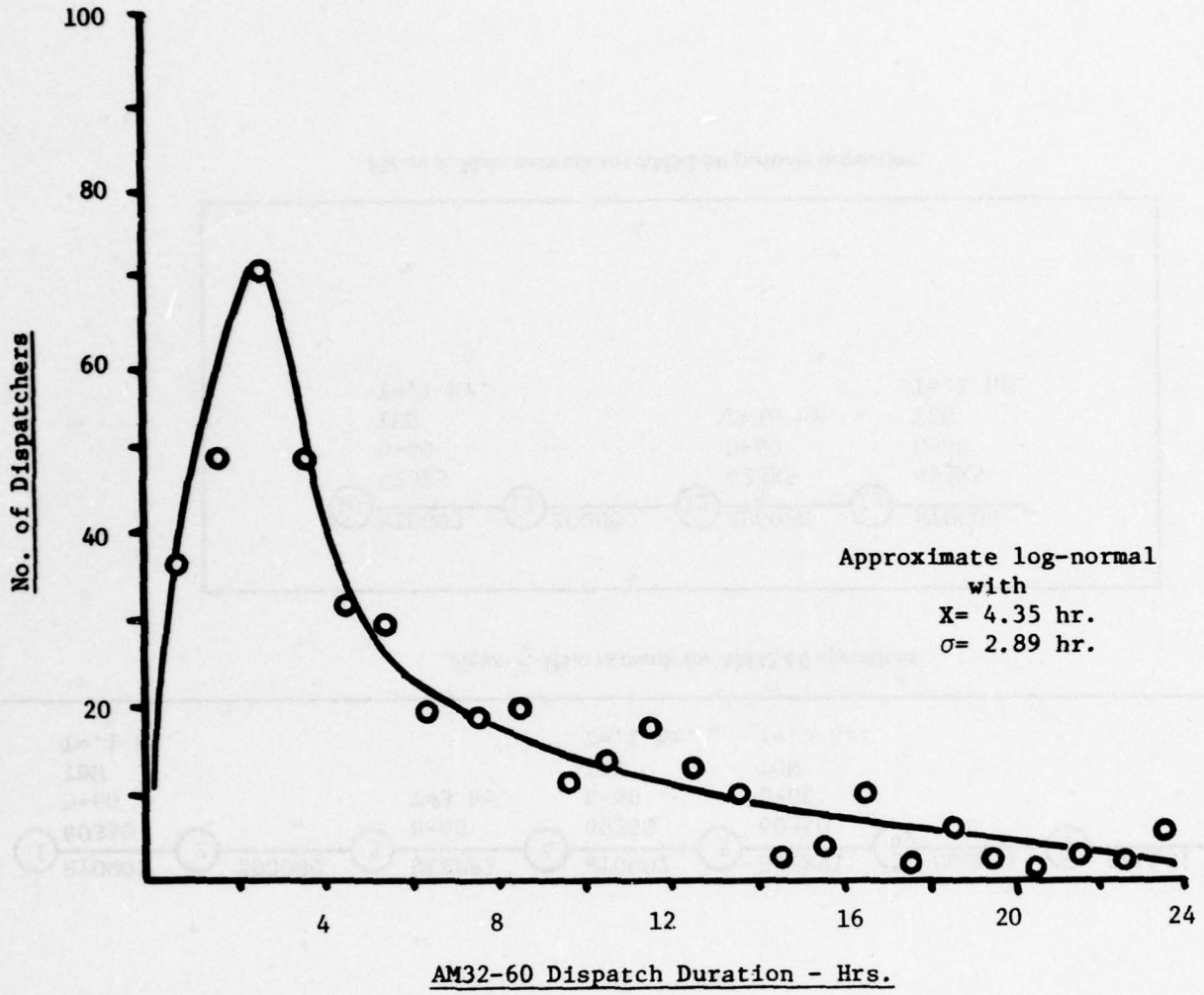


Figure 7. **Probability distribution of AM32-60 dispatch duration-hours, Myrtle Beach AFB, spring 1976.**

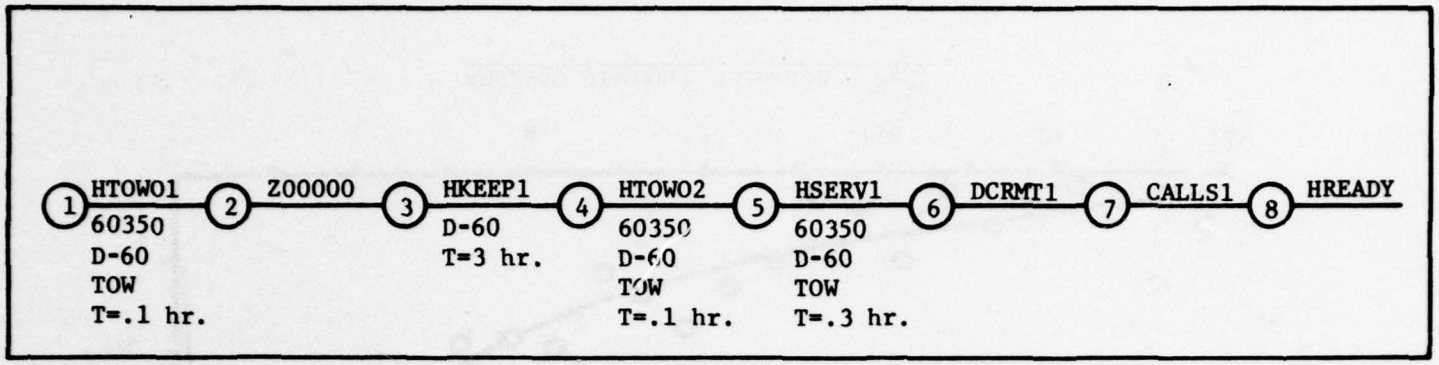


Figure 8. **Main network for AM32-60 operations.**

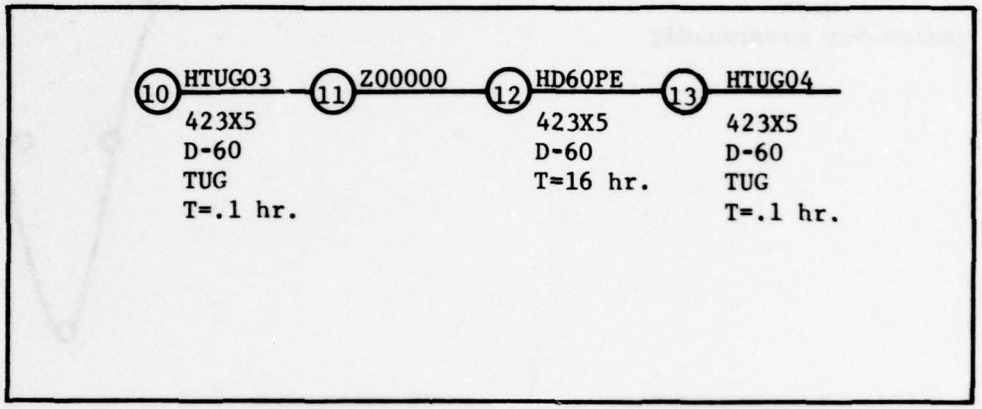


Figure 9. **Main network for AM32-60 periodic inspection.**

```
                          H          00010 AM32-60(D60) MAIN NETWORK
J0001 HTOW01  J0002  D     00010 31      1    C 1D60    1TOW    1603X0
J0002 Z00000  J0003  S     00010 11
J0003 HKEEP1  J0004  D     00010 31     30 30L 1D60
J0004 HTOW02  J0005  D     00010 31      1    C 1D60    1TOW    1603X0
J0005 HSERV1  J0006  D     00010 31      1    C 1D60    1TOW    1603X0
J0006 DORMT1  J0007  D     00010 31
J0007 CALLS1  J0008  C     00010 31
J0008 HREADY          D    00010 31
                          H  00010 AM32 60 PERIODIC INSPECTION(PE)
J0010 HTVR03  J0011  D     00010 31      1    C 1D60    1TUG    1423X5
J0011 Z00000  J0012  S     00010 11
J0012 HD6IPE  J0013  D     00010 31    160 29L 1D60    1423X5
J0013 HTUG04          D    00010 31      1    C 1D60    1423X5  1TUG
```

Figure 10a. **LCOM Form 11 (extended) listing for AM32-60 generator (main network and periodic inspection).**

```
                          H          00010    NF-2 MAIN NETWORK
J0020 HTOW04  J0021  D     00010 31      1    C 1NF2    1TOW    1603X0
J0021 Z00000  J0023  S     00010 11
J0023 HKEEP2  J0024  D     00010 31     30 30L 1NF2
J0024 HTOW05  J0025  D     00010 31      1    C 1NF2    1TOW    1603X0
J0025 HSERV2  J0026  D     00010 31      1    C 1NF2    1TOW    1603X0
J0026 DORMT2  J0027  D     00010 31
J0027 CALLS1  J0028  C     00010 31
J0028 HREAD2          D    00010 31
                          H  00010    NF-2 PERIODIC
J0030 HTOW06  J0031  D     00010 31      1    C 1NF2    1TUG    1423X5
J0031 Z00000  J0032  D     00010 11
J0032 HNF2PE  J0034  D     00010 31     80 29L 1NF2    1423X5
J0034 HTOW07          D    00010 31      1    C 1NF2    1TUG    1423X5
```

Figure 10b. **LCOM Form 11 (extended) listing for NF-2 light stand (main network and periodic inspection).**

Figures 8 and 9 outline the main dispatch networks for the AM32-60. The networks for the NF-2 are analogous. Figure 8 depicts a dummy sortie rate that generates requirements for the –60. Figure 9 presents an operational network for a dummy sortie that is driven by the –60 periodic inspection schedule. Note that there is a KEEP task in the main networks. This task represents the dispatch duration for the piece of SE equipment demanded. This duration is a random variable that follows the distribution outlined in Figure 7, and it also has the distribution parameters indicated in Figure 7.

The TOW tasks in Figures 8 and 9 are self-explanatory – so is the service task (SERV1). The DCRMT tasks decrement all of the failure clocks on the various significant components on the various pieces of SE considered. The clocks were decremented right after the SERV tasks because the investigations into the work center operations revealed that essentially all unscheduled maintenance tasks are discovered here. This is because essentially none of the SE failures would prevent the particular piece of SE from completing its mission. That is, it could go ahead and complete its mission with a faulty or "less than 100%" component, and the malfunction or damaged part would not be discovered or corrected until the mission was completed and the SE was being serviced. Also, should the piece of SE become inoperative during its mission performance (e.g., run out of gas), a second identical piece is dispatched so rapidly (one to five minutes) that the "SE mission" is essentially not delayed. These extra dispatches are accounted for by the demand per sortie rates that are greater than one in Figure 4.

CALLS1 checks to see if there has been a failure since the last dispatch (or sortie). If so, actions are completed in accordance with the appropriate networks in order to repair the component that failed. The READY task places the SE piece back in the operationally ready pool.

Figures 10a and 10b are listings from LCOM Form 11 (extended). These forms are used to describe the networks for input to the PHASE I model. Figure 10a represents the –60 operational networks and Figure 10b represents the NF-2 main operational networks.

Unscheduled Maintenance Tasks Networks for SE

The primary computer run efforts associated with the MDC program are TRN9T07, BASIC RUN, and PRINTOUT. Analogous efforts are now associated with the revised MDC program (MDCAGE). They are TRNAGE, BASIC AGE, and PRINTAGE. In addition, a new program AGEPREP, was needed to account for the unique characteristics the SE data have for aircraft data. The AGEPREP run was incorporated into the TRNAGE effort. Pertinent files are described in Figures 11a, 11b, and 11c.

The ABD64-A tapes are processed through the MDCAGE programs in somewhat the same manner that they are processed through the original MDC programs. Figure 12 shows a typical deck setup to process the TRNAGE run. Figure 13 further clarifies this setup routine. The nine track ABD64-A tapes are used as input. Also NIINs and the EQ/CL are specified at this time and inputted into TRNAGE. The particular types of SE whose maintenance data are to be processed are indicated by their EQ/CL or their NIINs.

The EQ/CL is identical for all pieces of SE which are of the same type. (e.g., all AM32-60s have EQ/CLs of BJ) (Columns 1 and 2 of Figure 12). The NIIN is unique for each piece of SE, therefore, "dummy" EQ/CLs are assigned to those types of SE that must be identified by their NIINs in order to group all individual pieces of one type of SE into one group. Consider Figure 12 and Figure 5 and note that all TTU-28E Hydraulic Mules are grouped under a "dummy" EQ/CL of OA (columns 4 and 5 of Figure 12 also indicates that all NF-2 Light Stands were grouped under an EQ/CL of OG; and that all maintenance data on the UJ-1 Bomblift Truck (whose EQ/CL is YK), all maintenance data on the Hydraulic Mule, on the Light Stand, and on the AM32-60 will be processed for this computer run effort.

Figure 14 shows a typical deck set-up to process BASIC AGE and Figure 15 further clarifies this set-up routine. Note that BASIC AGE is processed more than one time per run, (4 times in the example) in order to process more than one piece of SE per run. Figures 16a and 16b depict the input data for BASIC AGE and PRINTAGE. Figures 17 and 18 deal with PRINTAGE in an analogous manner.

Figures 19 and 20 present typical output from the revised MDC program. This output results in the data needed for the unscheduled maintenance on SE; or more specifically, the unscheduled maintenance on various components of the SE. Figure 19 is the on-equipment file, and Figure 20 is the off-equipment file.

Figure 21 depicts the unscheduled maintenance network for the chasis on the –60. Data for this network were obtained from Figures 19 and 20.

FILE-NAME(S)	TYPE-FILE	USAGE
ABD64A	Data 9-TRK Magnetic Tape	INPUT
BTRNAGE	FORTRAN Binary Permanent File	Converts 9-TRK Tape To Create Data File T7DATA
TYPE	Data (Acft Identifier)	INPUT
T7DATA	System Data Temporary Permanent File LFN=TAPE 7	Contains Acft Elimination Data - Purge As Soon As Possible
BAGEPREP	FORTRAN Binary Permanent File	Create Final OUTPUT for TRNAGE
EQPCLS	Data System File	INPUT
MFLIN, MSUF1 MSUF2	Data System File	INPUT
SORTMRG	Utility	Sorts Records Dependent on INPUT Sort Directives
LIMEQPCLASAGE	Data Permanent File	OUTPUT From TRNAGE INPUT To BASIC AGE

Figure 11a. **TRNAGE files.**

FILE-NAME	TYPE-FILE	USAGE
BGETAGE	FORTRAN Binary Permanent File	
LIMEQCLASAGE	Data Permanent File LFN=Tape 7	INPUT
NOMAF1	Data Permanent File LFN=Tape 40	INPUT (AFSC Nomen)
NOMAF2	Data Permanent File LFN=Tape 50	INPUT (AFSC Nomen)
SORT MRG	Utility	Sorts Records Dependent on INPUT Sort Directives
ADJUST	FORTRAN Binary LFN=Adjust	
BAGEBIN	FORTRAN Binary Permanent File	
COLLECT	FORTRAN Binary Permanent File	
BREPAGE	FORTRAN Binary Permanent File	
BTHRAGE	FORTRAN Binary Permanent File	
AGEQCLAS	Data Permanent File LFN-Tape 19	OUTPUT From Part 2 INPUT To Part 3

Figure 11b. **BASIC AGE files.**

FILE-NAME	TYPE-NAME	USAGE
AGEQCLAS	Data Permanent File LFN=Tape 8	INPUT
BPRTAGE	FORTRAN Binary Permanent File	
NOMAF2	Data Permanent File LFN=Tape 10	INPUT (AFSC Nomen)

Figure 11c. **PRINTAGE files.**

```
Z1VBH,STCSB,T1000,CM100000,IO2000,NT1. H710375/53771
COMMENT. INTERCOM BATCH **NO DECK
REQUEST,TAPE7,*PF.
ATTACH,BT,BTRNAGE,CY=2.
VSN,TAPE8=L00738/L00827/L00828.
REQUEST,TAPE8,NT,S,NORING.
BT.
CATALOG,TAPE7,T7DATA,CY=1,RP=999.
RETURN,TAPE7,TAPE8.
LIMIT,3072.
COPYBR,INPUT,TAPE20.
REWIND,TAPE20.
REQUEST,TAPE27,*PF.
ATTACH,BA,BASEPREP,CY=1.
ATTACH,TAPE27,T7DATA,CY=1.
REWIND,TAPE27.
REWIND,TAPE8,TAPE7.
RFL,70000.
BA.
FILE,TAPE8,BT=C,RT=Z,FL=71,FO=SQ.
FILE,TAPE7,BT=C,RT=Z,FL=71,FO=SQ.
LDSET,FILES=TAPE8/TAPE7.
SORTMRG.
CATALOG,TAPE7,LIMEQPCLASAGE,CY=1,RP=999.
RETURN,TAPE7.
*EOR
FA ← input
*EOR
DLD0A
DLU0A
FQ30A
FRC0A
FTK0A
LAA0G
LAB0G
LAC0G
LAD0G
LAE0G
LAF0G
LAG0G
LAH0G
LAI0G
LAJ0G
LAK0G
LAL0G
LAM0G
LAQ0G
} input
*EOR
BJ
YK
} input
*EOR
SORT
FILE,INPUT=TAPE8(R),OUTPUT=TAPE7(R)
FIELD,LSUF(70,2,DISPLAY)
KEY,LSUF(A,DISPLAY)
END
*EOF
```

Figure 12. **TRNAGE control cards and input deck.**

CARD	COLUMN	FORMAT	VARIABLE	DESCRIPTION
*1 unlimited	1-3	R3	MFIIN	Indicates data to be kept for processing FIIN designator for piece of equipment
**	4	R1	MSUF1	1st & 2nd characters of assigned dummy equipment class code.
	5	R1	MSUF2	
2				7/8/9 EOR card
3 N 1 N 25	1	R1	EQPCLS1(N)	Indicates data to be processed thru the SE data bank series. First and second character of real equipment class codes.
	2	R1	EQPCLS2(N)	

* This deck is to be in sorted order based on the MFIIN where letters come before numbers.

** A maximum of 4 different equipment class codes (either assigned "dummy" codes or real ones) is allowed.

Figure 13. **Program TRNAGE setup.**

```
Z1A6,STCSB,T777,ID500,CM70000. H710375 HICKS/53771
COMMENT. INTERCOM BATCH JOB ** NO DECK***
LIMIT,3072.
ATTACH,GA,BGETAGE,CY=10.
ATTACH,TAPE7,LIMEDPCLASAGE,CY=1.
ATTACH,TAPE40,NOMAF1,CY=1.
ATTACH,TAPE50,NOMAF2,CY=1.
REWIND,TAPE7,TAPE40,TAPE50.
FILE,TAPE1,FD=SQ,BT=C,RT=Z,FL=150.
FILE,TAPE4,FD=SQ,BT=C,RT=Z,FL=150.
FILE,TAPE7,FD=SQ,BT=C,RT=Z,FL=71.
LDSET,FILES=TAPE7/TAPE1.
GA.
REWIND,TAPE40.
REWIND(TAPE1)
LDSET(FILES=TAPE1/TAPE4)
SORTMR6(6C)
REWIND,TAPE4.
ATTACH,ADJUST,ADJUST,CY=1.
LDSET,PRESET=ZERO.
ADJUST.
RETURN,ADJUST.
REWIND,TAPE1,TAPE2.
FILE,TAPE1,FD=SQ,BT=C,RT=Z,FL=150.
ATTACH,AB,BASEBIN,CY=10.
AB.
REWIND,TAPE50.
REWIND(TAPE1,TAPE2)
FILE,TAPE2,FD=SQ,BT=C,RT=Z,FL=33.
LDSET(FILES=TAPE1/TAPE2)
SORTMR6(6C)
REWIND(TAPE1,TAPE2)
ATTACH,COLLECT,COLLECT,CY=1.
LDSET,PRESET=ZERO.
COLLECT.
RETURN,COLLECT.
REWIND(TAPE1,TAPE2)
FILE,TAPE2,FD=SQ,BT=C,RT=Z,FL=41.
LDSET(FILES=TAPE1/TAPE2)
SORTMR6(6C)
REWIND(TAPE1,TAPE2)
ATTACH,BR,BREPAGE,CY=1.
BR.
REWIND,TAPE8,TAPE9,TAPE10,TAPE12.
FILE,TAPE12,FD=SQ,BT=C,RT=Z,FL=150.
FILE,TAPE2,FD=SQ,BT=C,RT=Z,FL=41.
LDSET(FILES=TAPE1/TAPE2)
SORTMR6(6C)
REWIND(TAPE1,TAPE2)
REWIND,BR.
LDSET,PRESET=ZERO.
BR.
REWIND,TAPE8,TAPE9,TAPE10,TAPE12.
FILE,TAPE12,FD=SQ,BT=C,RT=Z,FL=150.
FILE,TAPE3,FD=SQ,BT=C,RT=Z,FL=33.
LDSET(FILES=TAPE3/TAPE12)
SORTMR6(6C)
REWIND,TAPE3,TAPE12.
COPYCF,TAPE3,TAPE19.
REWIND,TAPE3.
REWIND,TH.
LDSET,PRESET=ZERO.
TH.
REWIND,TAPE1,TAPE2,TAPE3,TAPE4,TAPE8,TAPE9,TAPE10,TAPE11,TAPE17.
CATALOG,TAPE19,AGEQCLAS,CY=1,RP=999.
RETURN,THRELVL.
RETURN,TAPE8,TAPE9,TAPE10,TAPE19.
EXIT.
REWIND,TAPE4.
*EOR
```

Repeat this sequence of cards for each time BASIC GETAGE processes an SE type.

Figure 14. **BASIC AGE control cards and input.**

```
BJ1516              5714
000
◆EOR
SORT(1,1,45,,4)
FILE(TAPE1,S,D,,R,N)
FILE(TAPE4,O,D,,R,N)
SEQ(37,ABCDEFGHIJKLMNOPQRSTUVWXYZ0123456789 )
KEY(A,C,1,29)
RECORD(I,U,45)
END
◆EOR
  500  600  600
◆EOR
SORT(1,1,33,,4)
FILE(TAPE1,S,D,,R,N)
FILE(TAPE2,O,D,,R,N)
SEQ(37,ABCDEFGHIJKLMNOPQRSTUVWXYZ0123456789 )
KEY(A,C,1,17)
RECORD(I,U,33)
END
◆EOR
SORT(1,1,41,,4)
FILE(TAPE1,S,D,,R,N)
FILE(TAPE2,O,D,,R,N)
SEQ(63 ,ABCDEFGHIJKLMNOPQRSTUVWXYZ0123456789+-◆/()$= ,.#[ ]%"←!&'?
                                                          <>@\↑;)
KEY(A,C,1,15)
RECORD(I,U,41)
END
◆EOR
SORT(1,1,33,,4)
FILE(TAPE12,S,D,,R,N)
FILE(TAPE3,O,D,,R,N)
SEQ(63 ,ABCDEFGHIJKLMNOPQRSTUVWXYZ0123456789+-◆/()$= ,.#[ ]%"←!&'?
                                                          <>@\↑;)
KEY(A,C,1,5)
RECORD(I,U,33)
END
◆EOR
```

NOTE: This sequence of cards should be repeated for each time BASIC AGE is processed with only the first two characters of the first card changed to reflect the EQ/CL being processed.

Figure 14 (*Continued*)

CARD	COLUMN	FORMAT	VARIABLE	DESCRIPTION
1	1-2	R2	MDS	Equipment class code (real or dummy) for data being processed.
Additional input which is the same as for GETDATA				
1	1-5	15	LIMONEQ	Upper limit for the on-equipment file of the ratio of elapsed time (in 1/10 hr. units) and maintenance actions
	6-10	15	LIMOFEQ	Same as in COMBINE
	11-15	15	LIMSERV	Upper limit for the service file of the ratio of elapsed time and maintenance actions.
Repeat this sequence of card inputs for the number of equipment class codes being processed.				

Figure 15. **BASIC AGE setup.**

```
23110 FMS MACHINE SHOP              531X0
23120 FMS METAL PROCESSING          532X0
23130 FMS STRUCTURAL REPAIR         534X0
23410 FMS AGE REPAIR                421R3
23420 FMS AGE SERVICING             421S3
23330 FMS ELECTRICAL                423X0
```

Figure 16a. **BASIC AGE input.**

```
421R3 FM FMS AGE REPAIR
421S3 FM FMS AGE SERVICING
423X0 FM ELECTRICAL
531X0 FM MACHINE SHOP
532X0 FM METAL PROCESSING
534X0 FM STRUCTURAL REPAIR
```

Figure 16b. **PRINTAGE input.**

CARD	COLUMN	FORMAT	VARIABLE	DESCRIPTION
1	23	R1	IEQPCL1	1st and 2nd characters of the equipment class code for the SE being processed. If a "dummy" code (i.e., EQPCL1 is a number), then only the FIINs are printed.
	25-28	1X,R3	IFIIN (I)	List of FIINs where $0 \leq I \leq 14$. This is for printout purposes only, when a dummy equipment code is given in Columns 23-24. If I > 14, place ETC in last position. The first character of each 4 col. block is not read, so the 3 characters FIIN must be right justified.
NOTE: Be sure to include cards for on-engine file although the data bank is a null file.				

Figure 17. **Program printage setup.**

```
Z1PA,T900,CM75000,STCSB,ID900. H710375 HICKS 53771
COMMENT. INTERCOM BATCH ◆◆◆ NO DECK
ATTACH,TAPE8,AGEQCLAS,CY=2.
COPYCF,TAPE8,TAPE9.
REWIND,TAPE9.
ATTACH,TAPE10,NOMAF2,CY=1.
REWIND,TAPE10.
ATTACH,BP,BPRTAGE,CY=1.
BP,PL=40000.
REWIND,TAPE10,BP,TAPE9.
COPYCF,TAPE8,TAPE9.
REWIND,TAPE9.
BP,PL=40000.
REWIND,TAPE10,BP,TAPE9.
COPYCF,TAPE8,TAPE9.
REWIND,TAPE9.
BP,PL=40000.
REWIND,TAPE10,BP,TAPE9.
COPYCF,TAPE8,TAPE9.
REWIND,IAPE9.
BP,PL=40000.
◆EOR
```

```
5714.00    10519.0  15RJ
(R5,R8/(F8.1,5(I6,F6.1)))
5714.00    10519.0  45RJ
(R5,R8/(F8.1,5(I6,F6.1)))
5714.00    10519.0  25RJ
(R5,R8,F8.1,4(I6,F6.1)/(F8.1,4(I6,F6.1),F8.1,4(I6,F6.1)))
5714.00    10519.0  35RJ
(R5,R8/(F8.1,5(I6,F6.1)))
5714.00    10519.0  15YK
(R5,R8/(F8.1,5(I6,F6.1)))
5714.00    10519.0  45YK
(R5,R8/(F8.1,5(I6,F6.1)))
5714.00    10519.0  25YK
(R5,R8,F8.1,4(I6,F6.1)/(F8.1,4(I6,F6.1),F8.1,4(I6,F6.1)))
5714.00    10519.0  35YK
(R5,R8/(F8.1,5(I6,F6.1)))
5714.00    10519.0  150A DLD DLU F03 FRC FTK
(R5,R8/(F8.1,5(I6,F6.1)))
5714.00    10519.0  450A DLD DLU F03 FRC FTK
(R5,R8/(F8.1,5(I6,F6.1)))
5714.00    10519.0  250A DLD DLU F03 FRC FTK
(R5,R8,F8.1,4(I6,F6.1)/(F8.1,4(I6,F6.1),F8.1,4(I6,F6.1)))
5714.00    10519.0  350A DLD DLU F03 FRC FTK
(R5,R8/(F8.1,5(I6,F6.1)))
5714.00    10519.0  150G LAA LAB LAC LAD LAE LAF LAG LAH LAI LAJ LAK LAL LAM LAQ
(R5,R8/(F8.1,5(I6,F6.1)))
5714.00    10519.0  450G LAA LAB LAC LAD LAE LAF LAG LAH LAI LAJ LAK LAL LAM LAQ
(R5,R8/(F8.1,5(I6,F6.1)))
5714.00    10519.0  250G LAA LAB LAC LAD LAE LAF LAG LAH LAI LAJ LAK LAL LAM LAQ
(R5,R8,F8.1,4(I6,F6.1)/(F8.1,4(I6,F6.1),F8.1,4(I6,F6.1)))
5714.00    10519.0  350G LAA LAB LAC LAD LAE LAF LAG LAH LAI LAJ LAK LAL LAM LAQ
(R5,R8/(F8.1,5(I6,F6.1)))
```

EOR card

EOR card

EOR card

Input

Figure 18. **PRINTAGE control cards and input.**

```
WUC=AA2     AFSC=   421X3   NOM= FM AGE                          CREW= 1     1.6 HR     5 R ACTIONS      93.2 MMH     16.85 MMH/1000FH
WUC=AA2     AFSC=   421X3   NOM= FM AGE                          CREW= 2     2.3 HR     7 R ACTIONS
WUC=AA2     AFSC=   421X3   NOM= FM AGE                          CREW= 3     1.7 HR     7 R ACTIONS
WUC=AA2     AFSC=   421X3   NOM= FM AGE                          CREW= 4      .5 HR     2 R ACTIONS
WUC=AA2     AFSC=   421X3   NOM= FM AGE                          CREW= 1      .3 HR     2 W ACTIONS       .6 MMH      .11 MMH/1000FH
WUC=AA2     AFSC=   421X3   NOM= FM AGE                          CREW= 1     7.1 HR     1 T ACTIONS      22.2 MMH     3.82 MMH/1000FH
WUC=AA2     AFSC=   421X3   NOM= FM AGE                          CREW= 2      .9 HR     1 T ACTIONS
WUC=AA2     AFSC=   421X3   NOM= FM AGE                          CREW= 3     2.3 HR     2 T ACTIONS
                    FOR WUC AAC  ,AFSC    421X3,MEAN M JOB TIME=  2.6, MEAN R JOB TIME=  1.8

WUC=AA2     AFSC=   423X0   NOM= FM ELECTRICAL                   CREW= 1     2.0 HR     1 M ACTIONS       2.0 MMH      .34 MMH/1000FH
                    FOR WUC AAC  ,AFSC    423X0,MEAN M JOB TIME=  2.0, MEAN R JOB TIME=  0.0

WUC=AA2     AFSC=   534X0   NOM= FM STRUCTURAL REPAIR            CREW= 2     1.6 HR     1 M ACTIONS       3.2 MMH      .55 MMH/1000FH
                    FOR WUC AAC  ,AFSC    534X0,MEAN M JOB TIME=  1.6, MEAN R JOB TIME=  0.0
                    WUC=AAC     UNIT MSBMA=    282.    QPA=   1

••••••••••••••••••••

                    WUC= AAC      AFSC     R ELAP    RMA     RPROB     M ELAP     MMA     MPROB
                                  421X3      1.45     28        78       2.20       6       .17
                                  423X0      0.00      0      0.00       2.00       1       .03
                                  534X0      0.00      0      0.00       1.60       1       .03

WUC=AADDF   AFSC=   421X3   NOM= FM AGE                          CREW= 1     2.7 HR     2 M ACTIONS       5.3 MMH      .91 MMH/1000FH

WUC=AADD    AFSC=   421X3   NOM= FM AGE                          CREW= 1     2.7 HR     2 M ACTIONS       5.3 MMH      .91 MMH/1000FH
                    WUC=AADD    UNIT MSBMA=    3629.    QPA=   1

••••••••••

                    WUC= AADD     AFSC     R ELAP    RMA     RPROB     M ELAP     MMA     MPROB
                                  421X3      0.00      0      0.00       2.65       2      1.00

WUC=AADEG   AFSC=   421X3   NOM= FM AGE                          CREW= 1      .5 HR     1 M ACTIONS       .5 MMH      .09 MMH/1000FH

WUC=AADE    AFSC=   421X3   NOM= FM AGE                          CREW= 1      .5 HR     1 M ACTIONS       .5 MMH      .09 MMH/1000FH
                    WUC=AADE    UNIT MSBMA=    7257.    QPA=   1

••••••••••

                    WUC= AADE     AFSC     R ELAP    RMA     RPROB     M ELAP     MMA     MPROB
                                  421X3      0.00      0      0.00        .50       1      1.00

WUC=AADGD   AFSC=   421X3   NOM= FM AGE                          CREW= 1     1.5 HR     1 R ACTIONS       1.5 MMH      .25 MMH/1000FH

WUC=AADGE   AFSC=   421X3   NOM= FM AGE                          CREW= 1     3.5 HR     1 M ACTIONS       3.5 MMH      .68 MMH/1000FH
WUC=AADGE   AFSC=   421X3   NOM= FM AGE                          CREW= 1     1.5 HR     1 R ACTIONS      13.5 MMH     2.33 MMH/1000FH
WUC=AADGE   AFSC=   421X3   NOM= FM AGE                          CREW= 3     4.0 HR     1 R ACTIONS

WUC=AADGJ   AFSC=   421X3   NOM= FM AGE                          CREW= 1     1.0 HR     1 M ACTIONS       5.5 MMH      .95 MMH/1000FH
WUC=AADGJ   AFSC=   421X3   NOM= FM AGE                          CREW= 3     1.5 HR     1 M ACTIONS
WUC=AADGJ   AFSC=   421X3   NOM= FM AGE                          CREW= 1     1.5 HR     1 R ACTIONS       1.5 MMH      .25 MMH/1000FH
```

Figure 19. **On-equipment file for AM32-60.**

```
MUC=AA3FL   AFSC=   423X0   NOM=  FM ELECTRICAL                    CREW= 1   5.0 HR     1 N5 ACTIONS      5.9 MMH        .65 MMH/100FH
  FOR MUC=AA3FL   REMOVALS=   2   ADJUSTED COUNT=   2   Q FACTOR=1.000   TOTAL IN SHOP=   1.   G PROB NO SHOP=  .0741
  MUC=AA3FL   UNIT MSBF=  7257.   G PROB= .00014   OPA=  1


MUC=AA3F    AFSC=   423X0   NOM=  FM ELECTRICAL                    CREW= 1   3.0 HR     2 N5 ACTIONS      5.9 MMH       1.02 MMH/100FH
  FOR MUC=AA3F    REMOVALS=   6   ADJUSTED COUNT=   6   Q FACTOR=1.000   TOTAL IN SHOP=   2.   G PROB NO SHOP=  .0935
  MUC=AA3F    UNIT MSBF=  3629.   G PROB= .00028   OPA=  1


*****IF REMOVED ITEM REPLACED FROM SUPPLY WHEN AVAILABLE:
      MUC=AA3F
   AFSC     W ELAP    WMA      WPROB     K ELAP     KMA     KPROB     N ELAP4    NMA4    NPROB4    N ELAP5    NMA5    NPROB5
   423X0      0.00      0       0.00       0.00       0      0.00        0.00       0       0.00       2.95       2      1.00

*****IF REMOVED ITEM ALWAYS BENCH CHECKED BEFORE REPLACEMENT:
      MUC=AA3F
   AFSC     PROB K4A   KWA ELAP   PROB NOT KWA   COND PROB WF   ELAP WF   COND PROB N4   ELAP N4   COND PROB N5   ELAP N5
   423X0        0.00       0.00           1.00           0.00      0.00           0.00      0.00           1.00      2.95


MUC=AA3     AFSC=   423X0   NOM=  FM ELECTRICAL                    CREW= 1   1.4 HR    14 C  ACTIONS    322.7 MMH       55.58 MMH/100FH
MUC=AA3     AFSC=   423X0   NOM=  FM ELECTRICAL                    CREW= 2   5.6 HR    26 C  ACTIONS
MUC=AA3     AFSC=   423X0   NOM=  FM ELECTRICAL                    CREW= 3  10.5 HR     1 C  ACTIONS
MUC=AA3     AFSC=   423XC   NOM=  FM ELECTRICAL                    CREW= 1   4.5 HR    22 WA ACTIONS    530.9 MMH       91.44 MMH/100FH
MUC=AA3     AFSC=   423X0   NOM=  FM ELECTRICAL                    CREW= 2   7.2 HR    27 WA ACTIONS
MUC=AA3     AFSC=   423X0   NOM=  FM ELECTRICAL                    CREW= 3  14.3 HR     2 WA ACTIONS
MUC=AA3     AFSC=   423X0   NOM=  FM ELECTRICAL                    CREW= 1   2.0 HR     4 N5 ACTIONS      7.8 MMH        1.34 MMH/100FH

MUC=AA3     AFSC=   534X0   NOM=  FM STRUCTURAL REPAIR             CREW= 1   1.8 HR     1 WA ACTIONS      1.8 MMH         .31 MMH/100FH
  FOR MUC=AA3     REMOVALS=  29   ADJUSTED COUNT=  28   Q FACTOR=1.036   TOTAL IN SHOP=  56.
  MUC=AA3     UNIT MSBF=   130.   G PROB= .00772   OPA=  1

**********IF REMOVED ITEM REPLACED FROM SUPPLY WHEN AVAILABLE:
      MUC=AA3
   AFSC     W ELAP    WMA      WPROB     K ELAP     KMA     KPROB     N ELAP4    NMA4    NPROB4    N ELAP5    NMA5    NPROB5
   423X0      6.28     51       .91 }.93  0.00       0      0.00        0.00       0       0.00       1.95       4       .97
   534X3      1.80      1       .02 }     0.00       0      0.00        0.00       0       0.00       0.00       0      0.00

**********IF REMOVED ITEM ALWAYS BENCH CHECKED BEFORE REPLACEMENT:
      MUC=AA3
   AFSC     PROB K4A   KWA ELAP   PROB NOT KWA   COND PROB WF   ELAP WF   COND PROB N4   ELAP N4   COND PROB N5   ELAP N5
   423X0         .91       6.28            .07           0.00      0.00           0.00      0.00           1.00      1.95
   534X0         .02       1.80           0.00           0.00      0.00           0.00      0.00           0.00      0.00


MUC=AA3MG   AFSC=   421X3   NOM=  FM AGE                          CREW= 1   1.0 HR     1 N5 ACTIONS      1.0 MMH         .17 MMH/100FH
  FOR MUC=AA3MG   REMOVALS=   0   ADJUSTED COUNT=   0   Q FACTOR=0.000   TOTAL IN SHOP=   1.
  MUC=AA3MG   UNIT MSBF=  7257.   G PROB= .00014   OPA=  1
```

Figure 20. **Off-equipment file for AM32-60.**

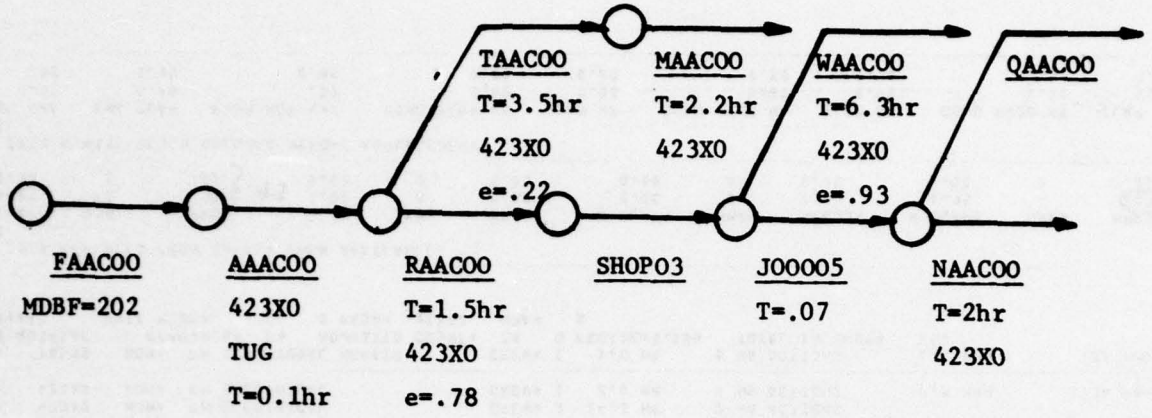


Figure 21. **Unscheduled maintenance AM32-60 generator general engine system task networks.**

The networks for the other components of the –60 and the NF-2 are analogous.

The first task depicted in Figure 21 is a failure clock with mean dispatches between failures (MDBF) indicated. The MDBF values were obtained from data obtained from the MDCAGE program and data from Figure 4. The rest of the network is developed in the same manner that unscheduled maintenance tasks are developed for airplanes; i.e., obtaining data and insight from the MDCAGE programs to develop an initial network and then checking and verifying these networks with maintenance specialists in the field.

Figures 22 and 23 are listings from LCOM Form 11s (extended). These illustrations represent all of the unscheduled maintenance tasks networks for the –60 and the NF-2, respectively. Normally, the unscheduled maintenance networks would not remove SE equipment from being operationally ready. The LCOM program assumes that they are associated with the aircraft, not the SE. Therefore, in order to get accurate statistics about the amount of time that the individual pieces of SE are down for maintenance, it is necessary to demand the appropriate piece of SE for every task in the unscheduled maintenance networks.

Results

Figures 24 and 25 are results obtained from an LCOM simulation of the A-7D SE work center. They address sensitivity studies performed for SE authorization levels, and personnel authorization levels. Both illustrations depict work centers that are performing over 99% of their missions. (Note the Operations Performance Summary.) Figure 24 represents a work center with an optimum level of manning. (Note the 60%-plus utilization of the 423X5s and the 603X0s in the Personnel Performance Summary. All other AFSCs are constrained by the necessity to have at least one of them assigned to the work center. However, Figure 24 also shows a low level of utilization of the SE. (Note the 60%-plus non-use of the –60 and the NF-2.) The apparent over-authorization of SE is necessary in order to assure that sufficient SE is operationally ready to perform 99%-plus of the missions of the SE work center.

Figure 25 represents an SE work center with an optimum authorization of SE. (Note the less than 34% non-use of the –60 and the NF-2.) However, the 423X5 and the 603X0 people are utilized less than 16% of the time. The excessive number of people are needed in order to assure that a large portion of the reduced amount of equipment is operationally ready a very large percentage of the time.

Thus, a tool has been developed and demonstrated whereby trade-offs between people and equipment can be investigated.

Figures 24 and 25 represent results obtained from the *first approach* recommended in Section I, Paragraph B. The primary advantages of the *first approach* over the *second approach* have been demonstrated; e.g., (a) the relative speed and simplicity with which initial answers may be obtained concerning manning and equipment authorizations for an SE work center as a function of operational demands on the center, and (b) the ease of conducting sensitivity analysis over the parameters just mentioned.

An LCOM simulation of the A-7D with the SE unscheduled maintenance networks incorporated per the *second approach* was performed. This approach gives more accurate results than does the *first*. It is recommended that the final answers be obtained via the *second approach* after the *first approach* is utilized to debug the SE unscheduled maintenance network, to obtain "ball park" answers, and to perform any sensitivity studies that may be needed.

IV. CONCLUSIONS

Various insights were obtained from this study effort. In the past, the whole concept of predicting manpower for SE has been obscured because the work centers have not been reviewed as a system in themselves. This study demonstrated that SE work centers can be treated thusly, and that they lend themselves quite readily to MMM modeling. The work centers respond to demands in a manner similar to the way aircraft maintenance responds to a flying schedule; e.g., SE dispatch activity drives the consumption of unscheduled maintenance, servicing, and pickup and delivery manhours in the same manner that aircraft sorties drives the consumption of unscheduled maintenance and servicing of aircraft.

It was also demonstrated that the interaction between the number of pieces of SE equipment on hand and the sortie rate of the weapon system and the manpower requirements can be accounted for. A new methodology has been developed which allows the analyst to investigate these interactions, and to attain a clearer understanding of the complexities that demands from various aircraft and equipment types place on the SE work center.

AF Form 864, *Daily Requirement and Dispatch Record*, is a key element in the analysis, and has been completely ignored in past SE work center study efforts. These records provide data as to when, how long, and by what aircraft or organization SE is used. It also provides a basis for computing failure rates for SE, which would be based upon mean demands on SE before maintenance actions. However, it should also be recognized that AF Form 864 may produce a very ill-defined dispatch activity if care is not taken. Such factors as pre-plants, sub-pools and multiple aircraft utilization of SE may come into play many times and they must be dealt with.

Differences between air bases, possibly reflecting differences in operational utilization and environment, can also be a factor influencing the dispatch and/or failure rates of SE. When selecting an air base from which to obtain completed AF Forms 864 upon which failures per demand are to be based, it would be wise to select a base that has operational and environmental conditions similar to those proposed at the work center being modeled. Further research is suggested to identify relevant environmental and operational factors, and establish procedures for taking the significant variables into account. The total answer will not be available until an intensive future effort is made to identify an improved measure for predicting SE failures which accounts for all significant factors.

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Tetmeyer, D.C., Nichols, S.R., & Deem, R.N. *Simulating maintenance manning for new weapon systems: Maintenance data analysis programs.* AFHRL-TR-74-97(III), AD-A025 342. Wright-Patterson AFB, OH: Advanced Systems Division, Air Force Human Resources Laboratory, May 1976.

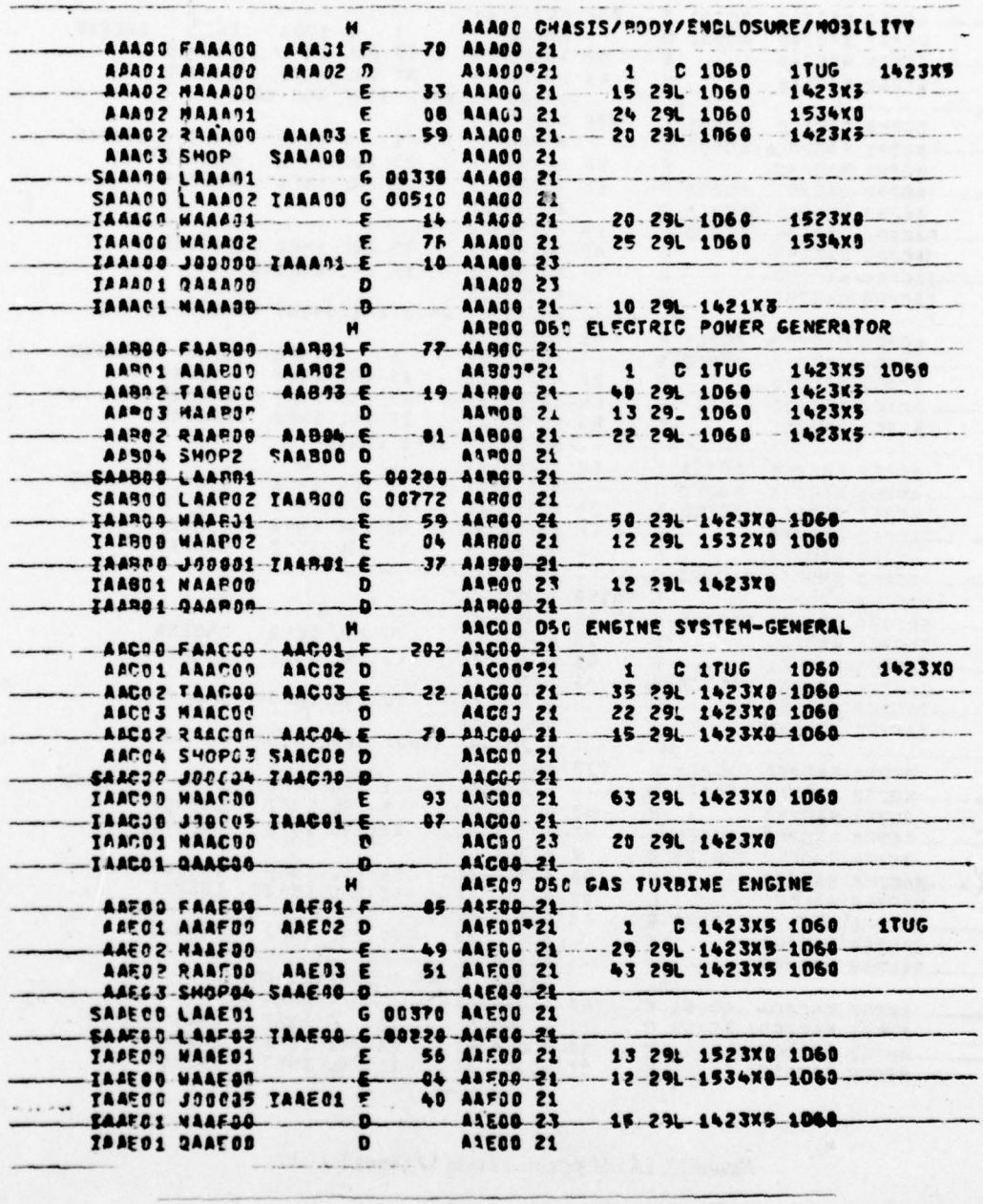
Tetmeyer, D.C., Nichols, S.R., Hart, W.L., & Maher, F.A. *Simulating maintenance manning for new weapon systems: Maintenance manpower matrix program.* AFHRL-TR-74-97(VI), AD-A025 311. Wright-Patterson AFB, OH: Advanced Systems Division, Air Force Human Resources Laboratory, May 1976.

TO 00-20 2, *The maintenance data collection system.*

TO 0025-06-2-2, *Support equipment work unit code manual.*

TO 35C2-3-1-06, *FSC 6115 electrical generator sets, engine.*

TO 35-1, *Application of Air Force registration numbers.*



```
                          M              AAA00 CHASIS/BODY/ENCLOSURE/MOBILITY
    AAA00 FAAA00  AAA01 F    70 AAA00 21
    AAA01 AAAA00  AAA02 D       AAA00*21     1   C 1060   1TUG    1423X5
    AAA02 MAAA00          E    33 AAA00 21    15 29L 1060   1423X5
    AAA02 MAAA01          E    08 AAA00 21    24 29L 1060   1534X0
    AAA02 RAAA00  AAA03 E    59 AAA00 21    20 29L 1060   1423X5
    AAA03 SHOP    SAAA00 D       AAA00 21
SAAA00 LAAA01         G 00336 AAA00 21
SAAA00 LAAA02 IAAA00  G 00510 AAA00 21
IAAA00 MAAA01         E    14 AAA00 21    20 29L 1060   1523X0
IAAA00 MAAA02         E    76 AAA00 21    25 29L 1060   1534X0
IAAA00 J00000 IAAA01  E    10 AAA00 23
IAAA01 QAAA00         D       AAA00 23
IAAA01 MAAA00         D       AAA00 21    10 29L 1421X5
                          M              AAB00 D50 ELECTRIC POWER GENERATOR
    AAB00 FAAB00  AAB01 F    77 AAB00 21
    AAB01 AAAB00  AAB02 D       AAB00*21     1   C 1TUG   1423X5 1D60
    AAB02 TAAB00  AAB03 E    19 AAB00 21    40 29L 1D60   1423X5
    AAB03 MAAB00          D       AAB00 21    13 29L 1D60   1423X5
    AAB02 RAAB00  AAB04 E    81 AAB00 21    22 29L 1060   1423X5
    AAB04 SHOP2   SAAB00 D       AAB00 21
SAAB00 LAAB01         G 00280 AAB00 21
SAAB00 LAAB02 IAAB00  G 00772 AAB00 21
IAAB00 MAAB01         E    59 AAB00 21    50 29L 1423X0 1D60
IAAB00 MAAB02         E    04 AAB00 21    12 29L 1532X0 1D60
IAAB00 J00001 IAAB01  E    37 AAB00 21
IAAB01 MAAB00         D       AAB00 23    12 29L 1423X0
IAAB01 QAAB00         D       AAB00 21
                          M              AAC00 D50 ENGINE SYSTEM-GENERAL
    AAC00 FAAC00  AAC01 F   202 AAC00 21
    AAC01 AAAC00  AAC02 D       AAC00*21     1   C 1TUG   1D60    1423X0
    AAC02 TAAC00  AAC03 E    22 AAC00 21    35 29L 1423X0 1D60
    AAC03 MAAC00          D       AAC00 21    22 29L 1423X0 1D60
    AAC02 RAAC00  AAC04 E    78 AAC00 21    15 29L 1423X0 1D60
    AAC04 SHOP03  SAAC00 D       AAC00 21
SAAC00 J00004 IAAC00  D       AAC00 21
IAAC00 MAAC00         E    93 AAC00 21    63 29L 1423X0 1D60
IAAC00 J00005 IAAC01  E    87 AAC00 21
IAAC01 MAAC00         D       AAC00 23    20 29L 1423X0
IAAC01 QAAC00         D       AAC00 21
                          M              AAE00 D50 GAS TURBINE ENGINE
    AAE00 FAAE00  AAE01 F    85 AAE00 21
    AAE01 AAAE00  AAE02 D       AAE00*21     1   C 1423X5 1D60   1TUG
    AAE02 MAAE00          E    49 AAE00 21    29 29L 1423X5 1D60
    AAE02 RAAE00  AAE03 E    51 AAE00 21    43 29L 1423X5 1D60
    AAE03 SHOP04  SAAE00 D       AAE00 21
SAAE00 LAAE01         G 00370 AAE00 21
SAAE00 LAAE02 IAAE00  G 00220 AAE00 21
IAAE00 MAAE01         E    56 AAE00 21    13 29L 1523X0 1D60
IAAE00 MAAE00         E    04 AAE00 21    12 29L 1534X0 1D60
IAAE00 J00035 IAAE01  E    40 AAE00 21
IAAE01 MAAE00         D       AAE00 23    15 29L 1423X5 1D60
IAAE01 QAAE00         D       AAE00 21
```

Figure 22. **LCOM extended Form 11 listing for AM32-60.**

```
                        H           AC2A0     NF-2 RUNNING GEAR
    AC2A0 FAC2A0  AC2A1 F   202 AC2A0 21
    AC2A1 AAC2A0  AC2A2 D       AC2A0*21      1   C 1TUG   1NF2   1423X5
    AC2A2 MAC2A0        E    57 AC2A0 21     12 29L 1NF2   1423X5
    AC2A2 RAC2A0        E    43 AC2A0 21     37 29L 1NF2   1423X5
                        H           AC2B0     NF-2 BODY AND BASE
    AC2B0 FAC2B0  AC2B1 F   275 AC2B0 21
    AC2B1 AAC2B0  AC2B2 D       AC2B0*21      1   C 1TUG   1NF2   1423X5
    AC2B2 MAC2B0        E    50 AC2B0 21     20 29L 1NF2   1423X5
    AC2B2 RAC2B0  AC2B3 E    50 AC2B0 21     15 29L 1NF2   1423X5
    AC2B3 SHOP10 SAC2B0 D       AC2B0 21
   SAC2B0 J000B6 IAC2B0 E    13 AC2B0 21
    SAC2B0 MAC2B0       E    07 AC2B0 21     35 29L 1NF2   1423X5
    IAC2B0 MAC2B0       D       AC2B0 21     17 29L 1423X5
    IAC2B0 QAC2B0       D       AC2B0 23
                        H           AC2C0     NF-2 INSTUMENT PANEL
    AC2C0 FAC2C0  AC2C1 F   551 AC2C0 21
    AC2C1 AAC2C0  AC2C2 D       AC2C0*21      1   C 1NF2   1TUG   1423X5
    AC2C2 MAC2C0        E    27 AC2C0 21     10 29L 1NF2   1423X5
    AC2C2 RAC2C0        E    64 AC2C0 21     13 29L 1NF2   1423X5
    AC2C2 RAC2C1        E    09 AC2C0 21     25 29L 1NF2   1532X0
                        H           AC2E0     NF-2 ENGINE
    AC2E0 FAC2E0  AC2E1 F    88 AC2E0 21
    AC2E1 AAC2E0  AC2E2 D       AC2E0*21      1   C 1NF2   1TUG   1423X5
    AC2E2 RAC2E1  AC2E3 E    29 AC2E0 21     50 29L 1NF2   1531X0
    AC2E2 MAC2E0        E    67 AC2E0 21     40 29L 1NF2   1423X5
    AC2F2 MAC2E1        E    04 AC2E0 21     18 29L 1NF2   1531X0
    AC2F3 SHOP11 SAC2E0 D       AC2F0 21
   SAC2F0 LAC2E0        G 00199 AC2E0 21
   SAC2E0 LAC2E1 IAC2E1 G 00182 AC2E0 21
    IAC2E1 MAC2E0       E    09 AC2E0 21      5 29L 1NF2   1423X5
    IAC2E1 MAC2E1       E    55 AC2E0 21     13 29L 1NF2   1532X0
    IAC2E1 J00030 IAC2E2 E    35 AC2E0 21
    IAC2E2 MAC2E0       D       AC2E0 23     20 29L 1NF2   1423X5
    IAC2E2 QAC2E0       D       AC2E0 21
                        H           AC2F0     NF-2  GENERATOR
    AC2F0 FAC2F0  AC2F2 F   212 AC2F0 21
    AC2F2 AAC2F0  AC2F3 D       AC2F0*21      1   C 1NF2   1TUG   1423X5
    AC2F3 MAC2F0        E    63 AC2F0 21      8 29L 1NF2   1423X5
    AC2F3 RAC2F0  AC2F4 E    37 AC2F3 21     22 29L 1NF2   1423X5
    AC2F4 SHOP12 SAC2F0 D       AC2F0 21
   SAC2F0 MAC2F0        E    92 AC2F0 21     24 29L 1NF2   1423X5
    SAC2F0 MAC2F1       E    03 AC2F0 21     12 29L 1NF2   1532X0
   SAC2F0 JAC2F0 IAC2F0 E    85 AC2F0 21
    IAC2F0 MAC2F0       D       AC2F0 23     55 29L 1NF2   1423X5
    IAC2F0 QAC2F0       D       AC2F0 21
                        H           AC2G0     NF-2 CONTROL BOX
    AC2G0 FAC2G0  AC2G1 F   757 AC2G0 21
    AC2G1 AAC2G0  AC2G2 D       AC2G0 21      1   C 1NF2   1423X5 1TUG
    AC2G2 MAC2G0        E    63 AC2G0 21     07 29L 1NF2   1423X5
    AC2G2 RAC2G0        E    37 AC2G0 21     10 29L 1NF2   1423X5
```

Figure 23. **LCOM extented Form 11 listing for NF-2.**

RUN NUMBER A7DAGE — PERFORMANCE SUMMARY — PERIOD FROM 60.00 TO 120.00

	OPERATIONS	TOTAL	DSPD60	DSPNF2	PED60	PENF2	
1	NUMBER OF MISSIONS REQUESTED	4409.00	2400.00	1980.00	9.00	20.00	0.00
2	NUMBER ACCOMPLISHED	4399.00	2397.00	1973.00	9.00	20.00	0.00
3	PERCENT ACCOMPLISHED	99.77	99.87	99.65	100.00	100.00	0.00
4	NUMBER OF SORTIES REQUESTED	4409.00	2400.00	1980.00	9.00	20.00	0.00
5	NUMBER ACCOMPLISHED	4399.00	2397.00	1973.00	9.00	20.00	0.00
6	PERCENT ACCOMPLISHED	99.77	99.87	99.65	100.00	100.00	0.00

	AIRCRAFT	TOTAL	XD60	XNF2							
7	NUMBER OF AIRCRAFT AUTH. (EOP)	19998.00	9999.00	9999.00	0.00						
8	NUMBER OF AIRCRAFT-DAYS AVAIL.	1199880.00	599940.00	*9940	0.00						
9	PCT SORTIES (INCL ALERT)	0.00	0.00	0.00	0.00						
10	PCT UNSCHED MAINTENANCE	0.00	0.00	0.00	0.00						
11	PCT SCHED MAINTENANCE	0.05	0.06	0.05	0.00						
12	PCT NORS	0.00	0.00	0.00	0.00						
13	PCT SERVICE + MSN. WAIT	0.01	0.01	0.01	0.00						
14	PCT OPERATIONALLY READY	99.93	99.92	99.94	0.00						
15	AVG. AIRCRAFT TURNAROUND TIME	4.07	4.26	3.84	0.00						
16	AVG. NO. OF SORTIES/ A/C /DAY	0.00	0.00	0.00	0.00						

	PERSONNEL	TOTAL	421X3	423X0	423X5	523X0	531X0	532X0	534X0	603X0	
17	MANHOURS AUTHORIZED (100)	17318.37	2879.99	2879.99	9.60	2879.99	2879.99	2879.99	2879.99	28.80	0.00
18	MANHOURS AVAILABLE (100)	17318.37	2879.99	2879.99	9.60	2879.99	2879.99	2879.99	2879.99	28.80	0.00
19	PERCENT UTILIZATION	0.16	0.00	0.07	66.79	0.00	0.01	0.00	0.01	64.16	0.00
20	MANHOURS USED (100)	27.54	0.03	1.93	6.41	0.07	0.27	0.03	0.32	18.48	0.00
21	PCT UNSCHED. MAINTENANCE	24.08	100.00	100.00	62.10	100.00	100.00	100.00	100.00	0.00	0.00
22	PCT SCHED. MAINTENANCE	75.92	0.00	0.00	37.90	0.00	0.00	0.00	0.00	100.00	0.00
23	NUMBER OF MEN DEMANDED	13630.00	3.00	66.00	421.00	4.00	6.00	2.00	14.00	13114.00	0.00
24	PCT AVAILABLE (PRIME)	57.91	100.00	100.00	58.67	100.00	100.00	100.00	100.00	57.47	0.00
25	PCT AVAILABLE (SUBST.)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
26	PCT PROV. BY EXPEDITE	17.36	0.00	0.00	0.95	0.00	0.00	0.00	0.00	18.01	0.00
27	PCT PROV. BY PREEMPTION	0.69	0.00	0.00	1.66	0.00	0.00	0.00	0.00	0.66	0.00
28	PCT DEMANDS NOT SATIS.	24.15	0.00	0.00	38.72	0.00	0.00	0.00	0.00	23.85	0.00
29	OVERTIME MANHOURS USED (100)	0.01	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00
30	MANHOURS PER FLYING HOUR	6.26	0.01	0.44	1.46	0.02	0.06	0.01	0.07	4.20	0.00
31	MOST TROUBLESOME PERS. ITEMS	0.00	3.01	3.02	3.03	4.01	4.02	4.03	5.01	5.02	5.03

Figure 24. **Results from A-7D SE work center simulation with optimum manning.**

RUN NUMBER A7DAGE — PERFORMANCE SUMMARY — PERIOD FROM 60.00 TO 120.00

	SHOP REPAIR	TOTAL	OTHERS	AAA00	AAB00	AAC00	AAE00	AC2B0	AC2E0	AC2F0	
32	NO. OF REPARABLE GENERATIONS	14.00	0.00	3.00	7.00	2.00	1.00	0.00	1.00	0.00	0.00
33	PCT BASE REPAIR	100.00	0.00	100.00	100.00	100.00	100.00	0.00	100.00	0.00	0.00
34	PCT DEPOT REPAIR	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
35	AVERAGE BASE REPAIR CYCLE	27.75	0.00	30.04	30.06	0.00	0.14	0.00	0.00	0.00	0.00
36	PCT ACTIVE REPAIR	100.00	0.00	100.00	100.00	0.00	100.00	0.00	0.00	0.00	0.00
37	PCT WHITE SPACE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
38	NO. OF ITEMS IN REPAIR (EOP)	7.00	0.00	2.00	2.00	2.00	0.00	0.00	1.00	0.00	0.00
39	NO. OF ITEMS BACKLOGGED (EOP)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	SUPPLY	TOTAL	OTHERS	AAA00	AAB00	AAC00	AAE00	AC2B0	AC2E0	AC2F0	
40	TOT DOLLAR INVEST.(1000)(EOP)	1050.00	0.00	150.00	150.00	150.00	150.00	150.00	150.00	150.00	0.00
41	FILL RATE PERCENT	100.00	0.00	100.00	100.00	100.00	100.00	0.00	100.00	0.00	0.00
42	NUMBER OF BACKORDER-DAYS	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
43	NUMBER OF UNITS DEMANDED	14.00	0.00	3.00	7.00	2.00	1.00	0.00	1.00	0.00	0.00
44	PCT OFF-THE-SHELF	100.00	0.00	100.00	100.00	100.00	100.00	0.00	100.00	0.00	0.00
45	PCT EXPEDITED REPAIR	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
46	PCT PREEMPTION	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
47	PCT DEMANDS NOT SATIS.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
48	NUMBER OF CANNIBALIZATIONS	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
49	NO. ITEMS ON BACKORDER (EOP)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
50		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
51	MOST TROUBLESOME SUPPLY ITEMS	0.00	15.00	16.00	17.00	18.00	19.00	20.00	21.00	0.00	0.00
	EQUIPMENT	TOTAL	D60	NF4	TOW	TUG					
52	TOT DOLLAR INVEST.(1000)(EOP)	4640.00	360.00	280.00	2000.00	2000.00	0.00				
53	EQUIPMENT HOURS AUTH. (100)	3340.80	259.20	201.60	1440.00	1440.00	0.00				
54	EQUIPMENT HOURS AVAIL. (100)	3340.80	259.20	201.60	1440.00	1440.00	0.00				
55	PCT USED - UNSCHED MAINT	0.20	1.85	0.85	0.00	0.01	0.00				
56	PCT USED - SCHED MAINT	5.11	32.89	33.25	1.28	0.00	0.00				
57	PCT UNUSED	94.69	65.25	65.91	98.72	99.98	0.00				
58	NUMBER OF BACKORDER-DAYS	0.36	0.15	0.21	0.00	0.00	0.00				
59	NUMBER OF UNITS DEMANDED	31338.00	9916.00	8071.00	3114.00	237.00	0.00				
60	PCT AVAILABLE	99.99	99.99	99.99	100.00	100.00	0.00				
61	PCT PROV. BY EXPEDITE	0.00	0.01	0.00	0.00	0.00	0.00				
62	PCT PROV. BY PREEMPTION	0.00	0.00	0.00	0.00	0.00	0.00				
63	PCT DEMANDS NOT SATIS.	0.00	0.00	0.01	0.00	0.00	0.00				
64	EQUIP. HOURS BACKLOG(100)(EOP)	0.03	0.03	0.00	0.00	0.00	0.00				
65	MOST TROUBLESOME EQUIP. ITEMS	0.00	11.00	12.00	13.00	14.00	0.00				

Figure 24. (*Continued*)

RUN NUMBER A7DAGE — P E R F O R M A N C E — S U M M A R Y — PERIOD FROM 61.00 TO 120.00

	O P E R A T I O N S	TOTAL	DSPD60	DSPNF2	PED60	PENF2	
1	NUMBER OF MISSIONS REQUESTED	4419.00	2400.00	1983.00	9.00	28.00	0.00
2	NUMBER ACCOMPLISHED	4339.00	2338.00	1968.00	9.00	23.00	0.00
3	PERCENT ACCOMPLISHED	98.32	97.42	99.39	100.00	100.00	0.00
4	NUMBER OF SORTIES REQUESTED	4419.00	2400.00	1983.00	9.00	28.00	0.00
5	NUMBER ACCOMPLISHED	4339.00	2338.00	1968.00	9.00	23.00	0.00
6	PERCENT ACCOMPLISHED	98.32	97.42	99.39	100.00	100.00	0.00

	A I R C R A F T	TOTAL	XD60	XNF2			
7	NUMBER OF AIRCRAFT AUTH. (EOP)	13998.00	9999.00	9999.00	0.00		
8	NUMBER OF AIRCRAFT-DAYS AVAIL.	1199994.00	599946.00	599948.00	0.00		
9	PCT SORTIES (INCL ALERT)	0.00	0.00	0.00	0.00		
10	PCT UNSCHED MAINTENANCE	0.00	0.00	0.00	0.00		
11	PCT SCHED MAINTENANCE	0.05	0.06	0.05	0.00		
12	PCT NORS	0.00	0.00	0.00	0.00		
13	PCT SERVICE + MSN. WAIT	0.00	0.00	0.00	0.00		
14	PCT OPERATIONALLY READY	99.94	99.93	99.95	0.00		
15	AVG. AIRCRAFT TURNAROUND TIME	3.67	3.76	3.56	0.00		
16	AVG. NO. OF SORTIES/ A/C /DAY	0.00	0.00	0.00	0.00		

	P E R S O N N E L	TOTAL	421X3	423X1	423X5	523X0	531X0	532X0	534X0	603X0	
17	MANHOURS AUTHORIZED (100)	17452.77	2879.99	2879.99	57.60	2879.99	2879.99	2879.99	2879.99	115.20	0.00
18	MANHOURS AVAILABLE (100)	17452.77	2879.99	2879.99	57.60	2879.99	2879.99	2879.99	2879.99	115.20	0.00
19	PERCENT UTILIZATION	0.15	0.00	0.06	11.63	0.00	0.01	0.00	0.01	15.35	0.00
20	MANHOURS USED (100)	26.67	0.01	1.61	6.72	0.09	0.32	0.02	0.22	17.53	0.00
21	PCT UNSCHED. MAINTENANCE	24.66	100.00	1.00	64.02	100.00	100.00	100.00	100.00	0.00	0.00
22	PCT SCHED. MAINTENANCE	75.34	0.00	99.00	35.98	0.00	0.01	0.00	0.00	100.00	0.00
23	NUMBER OF MEN DEMANDED	13410.00	1.00	60.00	406.00	6.00	8.00	2.00	9.00	12918.00	0.00
24	PCT AVAILABLE (PRIME)	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	0.00
25	PCT AVAILABLE (SURST.)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
26	PCT PROV. BY EXPEDITE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
27	PCT PROV. BY PREEMPTION	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
28	PCT DEMANDS NOT SATIS.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
29	OVERTIME MANHOURS USED (100)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
30	MANHOURS PER FLYING HOUR	6.15	0.00	0.37	1.55	0.02	0.07	0.01	0.05	4.04	0.00
31	MOST TROUBLESOME PERS. ITEMS	0.00	3.01	3.02	3.03	4.01	4.02	4.03	5.01	5.02	5.03

Figure 25. **Results from A-7D SE work center simulation with optimum SE assigned.**

RUN NUMBER A7DAGE — P E R F O R M A N C E — S U M M A R Y — PERIOD FROM 60.00 TO 120.00

	S H O P R E P A I R	TOTAL	OTHERS	AAAJJ	AABLJ	AACJJ	AAEGJ	AC2BJ	AC2EJ	AC2FJ	
32	NO. OF REPARABLE GENERATIONS	17.00	0.00	1.00	7.00	0.00	6.00	1.00	2.00	0.00	0.00
33	PCT BASE REPAIR	100.00	0.00	100.00	100.00	0.00	100.00	100.00	100.00	0.00	0.00
34	PCT DEPOT REPAIR	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
35	AVERAGE BASE REPAIR CYCLE	26.07	0.00	30.05	30.03	0.00	0.00	36.07	30.09	0.00	0.00
36	PCT ACTIVE REPAIR	100.00	0.00	100.00	100.00	0.00	100.00	100.00	100.00	0.00	0.00
37	PCT WHITE SPACE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
38	NO. OF ITEMS IN REPAIR (EOP)	3.00	0.00	1.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00
39	NO. OF ITEMS BACKLOGGED (EOP)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

	S U P P L Y	TOTAL	OTHERS	AAAJJ	AABLJ	AACJJ	AAEGJ	AC2BJ	AC2EJ	AC2FJ	
4	TOT DOLLAR INVEST.(1000)(EOP)	1650.00	0.00	150.00	150.00	150.00	150.00	150.00	150.00	150.00	0.00
41	FILL RATE PERCENT	100.00	0.00	100.00	100.00	0.00	100.00	100.00	100.00	0.00	0.00
42	NUMBER OF BACKORDER-DAYS	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
43	NUMBER OF UNITS DEMANDED	17.00	0.00	1.00	7.00	0.00	6.00	1.00	2.00	0.00	0.00
44	PCT OFF-THE-SHELF	100.00	0.00	100.00	100.00	0.00	100.00	100.00	100.00	0.00	0.00
45	PCT EXPEDITED REPAIR	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
46	PCT PREEMPTION	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
47	PCT DEMANDS NOT SATIS.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
48	NUMBER OF CANNIBALIZATIONS	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
49	NO. ITEMS ON BACKORDER (EOP)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
50		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
51	MOST TROUBLESOME SUPPLY ITEMS	0.00	15.00	16.00	17.00	18.00	19.00	20.00	21.00	0.00	0.00

	E Q U I P M E N T	TOTAL	D6L	NF4	TOW	TUG					
52	TOT DOLLAR INVEST.(1000)(EOP)	4320.00	180.00	140.00	2000.00	2000.00	0.00				
53	EQUIPMENT HOURS AUTH. (100)	3117.40	129.60	100.80	1440.00	1440.00	0.00				
54	EQUIPMENT HOURS AVAIL. (100)	3117.40	129.60	100.80	1440.00	1440.00	0.00				
55	PCT USED - UNSCHED MAINT	1.21	3.44	1.98	0.00	0.21	0.00				
56	PCT USED - SCHED MAINT	5.28	62.95	64.30	1.23	0.00	0.00				
57	PCT UNUSED	94.51	33.61	33.72	98.77	99.96	0.00				
58	NUMBER OF BACKORDER-DAYS	54.36	25.53	28.83	0.00	0.00	0.00				
59	NUMBER OF UNITS DEMANDED	3455.00	9639.00	8068.00	12918.00	23000.00	0.00				
60	PCT AVAILABLE	91.21	83.61	82.14	100.00	100.00	0.00				
61	PCT PROV. BY EXPEDITE	4.12	7.53	6.77	0.00	0.00	0.00				
62	PCT PROV. BY PREEMPTION	0.80	0.73	2.19	0.00	0.00	0.00				
63	PCT DEMANDS NOT SATIS.	4.87	8.13	8.92	0.00	0.00	0.00				
64	EQUIP. HOURS BACKLOG(100)(EOP)	0.00	0.00	0.00	0.00	0.00	0.00				
65	MOST TROUBLESOME EQUIP. ITEMS	0.00	11.00	12.00	13.00	14.00	0.00				

Figure 25. (*Continued*)

APPENDIX A: TRNAGE DISCUSSION AND LISTING

TRNAGE is a modification of TRN9T07 (AFHRL-TR-74-97(III)) which extracts SE data only from the ABD64-A tapes. It also pulls off specific equipment classes as restrained by card input. Equipment class codes AA-AZ have dummy equipment class codes assigned based on their NIIN's.

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      PROGRAM TRNSTO7  76/74  OPT=1                    FTN 4.5+414     01/03/77  16.32.54     PAGE     1

                      PROGRAM TRNSTO7(INPUT,OUTPUT,TAPE5=INPUT,TAPE6=OUTPUT,TAPE7,TAPE8)  TRNAGE     2
                      DIMENSION A(200),B(507)                                             TRNAGE     3
                      INTEGER ACFT,      OUTPUTR,RECORD,EOF,PARITY,TYPE,REJECTS,A,B       TRNAGE     4
                      REJECTS=0                                                           TRNAGE     5
                    5 READ (5,1) TYPE                                                     TRNAGE     6
                    1 FORMAT(R2)                                                          TRNAGE     7
                      NTYPE=0                                                             TRNAGE     8
                      OUTPUTR=0                                                           TRNAGE     9
                      RECORD=0                                                            TRNAGE    10
                   10 PARITY=0                                                            TRNAGE    11
                      EOF=0                                                               TRNAGE    12
                      K1=1                                                                TRNAGE    13
                    2 BUFFER IN (8,0) (A(1),A(200))                                       TRNAGE    14
                      RECORD=RECORD+1                                                     TRNAGE    15
                   15 IF (UNIT(8)) 3,4,5                                                  TRNAGE    16
                    4 EOF=EOF+1                                                           TRNAGE    17
                      WRITE (6,6) EOF,RECORD                                              TRNAGE    18
                    6 FORMAT (12H0END OF FILE,I10,12H   IN RECORD,I10)                    TRNAGE    19
                      IF (EOF-2) 2,41,40                                                  TRNAGE    20
                   20 41 BUFFER IN (8,0) (A(1),A(200))                                    TRNAGE    21
                      IF (UNIT(8)) 42,40,40                                               TRNAGE    22
                   42 LEN=LENGTH(8)                                                       TRNAGE    23
                      IF (LEN.NE.0) GO TO 50                                              TRNAGE    24
                   17 DECODE (80,49,A(1)) IENDTAP,NUMDATA                                 TRNAGE    25
                   25 49 FORMAT(T40,R1,T46,R7)                                            TRNAGE    26
                      PRINT 48,IENDTAP,NUMDATA,RECORD                                     TRNAGE    27
                   48 FORMAT(* END OF TAPE INDICATOR WAS *,R1,*   NUMBER OF RECORDS IN D  TRNAGE    28
                     1ATA FILE GIVEN AS *,R7,*  RECORD COUNT = *,I10)                     TRNAGE    29
                      IF (IENDTAP.EQ.1R0) GO TO 2                                         TRNAGE    30
                   30 IF (IENDTAP.NE.1R1) GO TO 40                                        TRNAGE    31
                      CALL REMARK(65HOPERATOR, PLEASE PUT UP THE NEXT OF THE MULTI-REELS  TRNAGE    32
                     1 FOR LF TAPE8.)                                                     TRNAGE    33
                      REWIND 8                                                            TRNAGE    34
                      PAUSE 55727                                                         TRNAGE    35
                   35 EOF=0                                                               TRNAGE    36
                      RECORD=0                                                            TRNAGE    37
                      GO TO 2                                                             TRNAGE    38
                    C  16 WORDS PER LINE OF AIRCRAFT DATA INPUT                           TRNAGE    39
                    C  ONLY 13 WORDS KEPT FOR OUTPUT                                      TRNAGE    40
                   40 C   39 LINES * 13 WORDS = 507 WORDS PER OUTPUT RECORD              TRNAGE    41
                    40 LAST=507                                                           TRNAGE    42
                      K2=MOD(NTYPE*13,507)                                                TRNAGE    43
                      IF (K2.EQ.0) GO TO 21                                               TRNAGE    44
                      LAST=K2                                                             TRNAGE    45
                   45 OUTPUTR=OUTPUTR+1                                                   TRNAGE    46
                      BUFFER OUT (7,1) (B(1),B(K2))                                       TRNAGE    47
                      IF (UNIT(7)) 21,30,30                                               TRNAGE    48
                   21 WRITE (6,19) OUTPUTR,NTYPE,TYPE                                     TRNAGE    49
                   19 FORMAT(10H0THERE ARE,I7,28H   OUTPUT RECORDS CONTAINING,I10,14H     TRNAGE    50
                   50 1LINES OF   ,A10,16H   AIRCRAFT DATA)                               TRNAGE    51
                      WRITE (6,22) LAST                                                   TRNAGE    52
                   22 FORMAT(25H0THE LAST RECORD CONTAINS,I5,8H   WORDS)                  TRNAGE    53
                   24 WRITE (6,23) REJECTS,NTYPE,TYPE,OUTPUTR,RECORD,PARITY,EOF           TRNAGE    54
                   23 FORMAT (8HOREJECTS,I10,8H   NTYPE,I10,7H   TYPE,3XR2, 9H  OUTPUTR,  TRNAGE    55
                   55 1I10,9H   RECORD,I10,9H   PARITY,I10,6H   EOF,I10)                  TRNAGE    56
                      38 ENDFILE 7                                                        TRNAGE    57
                      STOP                                                                TRNAGE    58
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      5     PARITY=PARITY+1                                                  TRNAGE    59
            WRITE (6,7) PARITY,RECORD                                        TRNAGE    60
 60   7     FORMAT (13H0PARITY ERROR,I10,12H   IN RECORD,I10)                TRNAGE    61
            IF (PARITY.LE.15) GO TO 2                                        TRNAGE    62
            GO TO 24                                                         TRNAGE    63
      3     LEN=LENGTH(8)                                                    TRNAGE    64
            IF (RECORD-1) 8,16,8                                             TRNAGE    65
 65         C  WRITES OUT HEADER RECORD AND DROPS IT                         TRNAGE    66
      16    WRITE (6,9) RECORD,LEN,(A(I),I=1,LEN)                            TRNAGE    67
      9     FORMAT (7H0RECORD,I10,9H   LENGTH,I10/(1X,13A10))                TRNAGE    68
            GO TO 2                                                          TRNAGE    69
      8     IF (LEN.EQ.160) GO TO 13                                         TRNAGE    70
 70         WRITE (6,14) RECORD,LEN                                          TRNAGE    71
      14    FORMAT (7H0RECORD,I10,9H   LENGTH,I10)                           TRNAGE    72
            WRITE (6,23) REJECTS,NTYPE,TYPE,OUTPUTR,RECORD,PARITY,EOF        TRNAGE    73
      13    IF (LEN.EQ.8) GO TO 17                                           TRNAGE    74
            IF (MOD(LEN,16).NE.0) GO TO 50                                   TRNAGE    75
 75         LEN=LEN/16                                                       TRNAGE    76
            J=-15                                                            TRNAGE    77
            DO 10 I=1,LEN                                                    TRNAGE    78
            K=K1                                                             TRNAGE    79
            J=J+16                                                           TRNAGE    80
 80         I2=K                                                             TRNAGE    81
            I3=J                                                             TRNAGE    82
            C  ONLY WANT TO KEEP THE FIRST 130 CHARACTERS OUT OF THE 160 CHARACTER I TRNAGE    83
            C   ATTACH,CC6600,CC6600,ID=X654321,MR=1.   PLACE IN JOB STREAM IF  TRNAGE    84
            C   LIBRARY,CC6600.                         CALL STRING IS USED.     TRNAGE    85
 85         C     CALL STRING(130,A(J), 1,B(K),1)       THE FOLLOWING 5 CARDS REPLAC TRNAGE    86
            C                                           CALL STRING.  USE STRING FOR TRNAGE    87
            C                                           DEBLOCKING RECORDS WHEN NEED TRNAGE    88
            DO 99 I1=1,13                                                    TRNAGE    89
            B(I2)=A(I3)                                                      TRNAGE    90
 90         I3=I3+1                                                          TRNAGE    91
            I2=I2+1                                                          TRNAGE    92
      99    CONTINUE                                                         TRNAGE    93
            I4=K+1                                                           TRNAGE    94
            DECODE (10,53,B(I4)) LPRE                                        TRNAGE    95
 95   53    FORMAT(3X,R1,6X)                                                 TRNAGE    96
            IF(LPRE.NE.1RG) GO TO 52                                         TRNAGE    97
            M=I4+11                                                          TRNAGE    98
            DECODE (10,51,B(M)) LFORM,ACFT                                   TRNAGE    99
      51    FORMAT(2X,R1,R2,5X)                                              TRNAGE   100
100         IF(ACFT.EQ.TYPE) GO TO 52                                        TRNAGE   101
            IF ((LFORM.EQ.1R1).O.(LFORM.EQ.1R3)) GO TO 25                    TRNAGE   102
            IF ((LFORM.EQ.1R4).O.(LFORM.EQ.1R5).O.(LFORM.EQ.1R7)) GO TO 25   TRNAGE   103
            C  REJECTED RECORDS                                              TRNAGE   104
      52    REJECTS=REJECTS+1                                                TRNAGE   105
105         IF(REJECTS.GT.100) GO TO 18                                      TRNAGE   106
            K2=K+12                                                          TRNAGE   107
            WRITE(6,12) (B(J1),J1=K,K2)                                      TRNAGE   108
      12    FORMAT (1H0,13A10)                                               TRNAGE   109
            GO TO 18                                                         TRNAGE   110
110         C   GOOD RECORDS                                                 TRNAGE   111
      25    NTYPE=NTYPE+1                                                    TRNAGE   112
            K1=K1+13                                                         TRNAGE   113
            IF (MOD(NTYPE,39).NE.0) GO TO 18                                 TRNAGE   114
            OUTPUTR=OUTPUTR+1                                                TRNAGE   115
115         BUFFER OUT (7,1) (B(1),B(507))                                   TRNAGE   116
            IF (UNIT(7)) 32,30,30                                            TRNAGE   117
      32    K1=1                                                             TRNAGE   118
      18    CONTINUE                                                         TRNAGE   119
            GO TO 2                                                          TRNAGE   120
120   50    ENDFILE 7                                                        TRNAGE   121
            STOP 7777                                                        TRNAGE   122
            END                                                              TRNAGE   123
```

```
      PROGRAM AGEPREP(INPUT,OUTPUT,TAPE27,TAPE8,TAPE20,TAPE21=INPUT)      AGEP      2
      INTEGER B(507),EQPCLS1(25),EQPCLS2(25)                              AGEP      3
      DATA EQPCLS1,EQPCLS2/25*0,25*0/                                     AGEP      4
      DO 5 I=1,25                                                         AGEP      5
      READ (21,1) EQPCLS1(I),EQPCLS2(I)                                   AGEP      6
1     FORMAT(2R1)                                                         AGEP      7
      IF (EOF(21)).9,2                                                    AGEP      8
2     PRINT 3,I,EQPCLS1(I),EQPCLS2(I)                                     AGEP      9
3     FORMAT(10H           ,I2,4X,2R1)                                    AGEP     10
5     CONTINUE                                                            AGEP     11
      NUMEQP=25                                                           AGEP     12
      GO TO 39                                                            AGEP     13
9     NUMEQP=I-1                                                          AGEP     14
39    BUFFER IN (27,1) (B(1),B(507))                                      AGEP     15
      IF (UNIT(27)) 10,50,50                                              AGEP     16
10    II=1                                                                AGEP     17
      GO TO 20                                                            AGEP     18
25    II=II+13                                                            AGEP     19
      IF (II.GT.507) GO TO 30                                             AGEP     20
20    DECODE (130,10991,B(II)) JCN,LWC,LPRF,LTAIL,LT,LWUC,LATC,LDISC,MAL  AGEP     21
     1,MA,LSTRT,LDAY,LSTOP,LCREW,ITEM,ITM2,IFIIN,METI,IEND,MTH,LOTCLAS,   AGEP     22
     2IOPCD,LSUF1,LSUF2                                                   AGEP     23
10991 FORMAT(R7,R5,T14,R1,R4,T51,R1,T53,A5,2R1,R3,I2                      AGEP     24
     1,R4,I3,R4,R1,T87,A10,A1,R3,R6,T117,R1,I4,4R1)                       AGEP     25
C  LSUF1=B THROUGH E                                                      AGEP     26
      IF (LSUF1-53) 60,95,99                                              AGEP     27
C  LSUF1=A SETS UNIQUE EQP. CLASS CODE ASSIGNED LSUF1 AND LSUF2 BASED ON AGEP     28
60    IF (LSUF1-19) 25,65,95                                              AGEP     29
C  LSUF1=Y                                                                AGEP     30
97    IF (LSUF1-310) 25,95                                                AGEP     31
C CHECK FOR ACCEPTABLE EQUIPMENT CLASS CODES                              AGEP     32
95    DO 99 I=1,NUMEQP                                                    AGEP     33
      IF (LSUF1-EQPCLS1(I)) 25,96,99                                      AGEP     34
96    IF (LSUF2-EQPCLS2(I)) 25,40,99                                      AGEP     35
99    CONTINUE                                                            AGEP     36
      GO TO 25                                                            AGEP     37
C  CHECK FOR ACCEPTABLE FIINS FOR EQUIPMENT CLASS CODES OF AA-AZ.         AGEP     38
65    REWIND 20                                                           AGEP     39
66    READ (20,67) MFIIN,MSUF1,MSUF2                                      AGEP     40
67    FORMAT(R3,2R1)                                                      AGEP     41
      IF (EOF(20)) 25,70                                                  AGEP     42
70    IF (IFIIN-MFIIN) 25,75,66                                           AGEP     43
75    LSUF1=MSUF1                                                         AGEP     44
      LSUF2=MSUF2                                                         AGEP     45
40    WRITE (8,10992) JCN,LWC,LPRF,LTAIL,LT,LWUC,LATC,LDISC,MAL,MA,       AGEP     46
     1LSTRT,LDAY,LSTOP,LCREW,ITEM,ITM2,IFIIN,METI,IEND,MTH,LOTCLAS,       AGEP     47
     2IOPCD,LSUF1,LSUF2                                                   AGEP     48
10992 FORMAT(R7,R5,R1,R4,R1,A5,2R1,R3,I2,R4,I3,R4,R1,A10,A1,R3,R6,R1,     AGEP     49
     1I4,4R1)                                                             AGEP     50
      GO TO 25                                                            AGEP     51
   50 CONTINUE                                                            AGEP     52
      END                                                                 AGEP     53
```

APPENDIX B: GETAGE DISCUSSION AND LISTING

GETAGE is a version of GETDATA (AFHRL-TR-74-97(III)) for SE equipment. It uses a formatted READ on one record at a time rather than a buffer in of 39 records. It treats only one type of equipment class code data at a time; i.e., when a new code is encountered, it treats that like an end-of-file. Records which are dropped are printed out and labelled as "unacceptable record." Work Unit Codes (WUC) with the left-most character of a letter or of zero are kept. The AGE SERVICE file replaces the aircraft SCHEDULED file, NTYPE=3. It is split off from the other files by having a zero as the left-most character in the WUC. Since it has no action taken codes, a maintenance type code (variable name LT) of A is assigned a 1, D=2, P=3, and S=4. On=equipment (NTYPE=1) and off-equipment (NTYPE-0-6) files must have maintenance type codes of P, B, or S to be acceptable. In GETDATA for on-equipment data, the how malfunctioned code of 799 is only kept when it is accompanied by an action taken code of X. In GETAGE all 799 codes are kept. GETDATA for on-equipment data drops how malfunctioned codes of 800 and 805 for action taken codes of P and R. GETAGE keeps P's and R's with 800's and 805's. MA≥5 have records printed out for user to check but are not dropped. *NO ENGINE*, NTYPE=4 is split out for SE equipment.

```
      PROGRAM GETAGE (OUTPUT,TAPE7=2049,TAPE1,TAPE6=2049,INPUT,          GETAGE     2
     1TAPE4=INPUT,TAPE8,TAPE40)                                          11NOV6     1
      DIMENSION IWCID(98),IAFSC(98),NOM(3),MTRXDIS(5),PERCENT(5)         GETAGE     4
      INTEGER ATCS(17),ATCC(18),WUCLVL   ,SCOUNT,       WUCKEEP(10),CHEK GETAGE     5
     1WUC                                                                GETAGE     6
      DATA NTAPE/7/,MTRXDIS/5*0/,                                        GETAGE     7
     1ATCS/1R ,1RR,1RH,1RY,1RX,1RF,1RG,1RL,1RV,1RZ,1RJ,1RK,1RB,1RC,1RA, GETAGE     8
     21RM,1RN/,ATCC/5,4,2*3,2,7*1,2,3,4,2*5,6/                           GETAGE     9
     3,WUCKEEP/3R000,9*0/                                               GETAGE    10
      DATA       IMTAIL,IMPRE,IMLT,IMSUF,       IMWUC,IMATC,IMMAL,IMMA, GETAGE    11
     1IMDISC,IMMMM,IMWC,IMJCN,      IMDAY,      IMCREW/14*0/            GETAGE    12
      DATA IMSTOP,IMSTRT,IMIORCD,IMOTCLS/4*0/                            GETAGE    13
      IFOPCLS=0                                                          GETAGE    14
      L1 = 1                                                             GETAGE    15
      MMM = 0                                                            GETAGE    16
      IA=0                                                               GETAGE    17
      IC=0                                                               GETAGE    18
      IE=0                                                               GETAGE    19
      IG=0                                                               GETAGE    20
      ICNT=59                                                            GETAGE    21
C  COLUMN 6 IS VARIABLE  IADJUST  WHICH MUST BE 6 IF THE ADJUST PROGRAM   GETAGE    22
C  USED BEFORE COMBINE PROGRAM.  IF = 6, THEN  NTYPE = 6 FOR OFF-EQUIP.   GETAGE    23
C  THAN 6 NTYPE =2 AS USUAL.  ALSO, REMEMBER TO CHANGE THE SORTMRG OUTPU  GETAGE    24
C  CARD TO TAPE4  INSTEAD OF TAPE2  IF ADJUST IS USED.                    GETAGE    25
      READ (4,19992) MDS,M,WUCLVL,INDXDIS,IADJUST,ISCRTIE,ISORTCK        GETAGE    26
19992 FORMAT(R2,4I1,T20,I5,T20,R5)                                       GETAGE    27
      IF ((WUCLVL.NE.3).A.(WUCLVL.NE.4)) WUCLVL=5                        GETAGE    28
      INDXDIS=1                                                          GETAGE    29
      IF ((INDXDIS.LE.0).O.(INDXDIS.GT.5)) INDXDIS=5                     GETAGE    30
      PRINT 19996,MDS,M,WUCLVL,INDXDIS,IADJUST                           GETAGE    31
19996 FORMAT(* MDS = *,R2,*   # TAPES = *,I1,*   WUCLVL = *,I1,*   WHEN  GETAGE    32
     1DISCOVERED CHOICE = *,I1,*   AND IADJUST CHOICE =*,I2)              GETAGE    33
      M=8-M                                                              GETAGE    34
      DO 19993 I1=1,91                                                   GETAGE    35
      READ(40,19991) IWCID(I1),NOM,IAFSC(I1)                             11NOV6     2
      IF(EOF(40))19994,19993                                             11NOV6     3
19993 PRINT 19995,I1,IWCID(I1),NOM,IAFSC(I1)                             GETAGE    38
19995 FORMAT(10X,I2,5XR5,5X,2A10,A6,5XR5)                                GETAGE    39
19991 FORMAT(R5,2A10,A6,R5)                                              GETAGE    40
19994 IWCS=I1-1                                                          GETAGE    41
      DO 99995 I1=1,11                                                   GETAGE    42
      READ (4,99991) WUCKEEP(I1)                                         GETAGE    43
99991 FORMAT(R3)                                                         GETAGE    44
      IF (EOF(4)) 99996,99992                                            GETAGE    45
99992 IF (WUCKEEP(I1).EQ.3R000) GO TO 99994                              GETAGE    46
      PRINT 99993,I1,WUCKEEP(I1)                                         GETAGE    47
99993 FORMAT(* PROCESS WUC(*,I2,*) = *,R3,*--.*)                         GETAGE    48
      GO TO 99995                                                        GETAGE    49
99994 PRINT 99999                                                        GETAGE    50
99999 FORMAT(* PROCESS ALL GOOD WUC RECORDS.*)                           GETAGE    51
      WUCKEEP(1)=3R000                                                   GETAGE    52
      GO TO 99996                                                        GETAGE    53
99995 CONTINUE                                                           GETAGE    54
99996 CONTINUE                                                           GETAGE    55
10000 READ  (7,10991) JCN,LWC,LPRE,LTAIL,LT,LWUC,LATC,LDISC,LMAL,LMA,    GETAGE    56
     1LSTRT,LDAY,LSTOP,LCREW,ITEM,ITM2,IFIIN,METI,IEND,MMM,LOTCLAS,      GETAGE    57
     2IORCD,LSUF                                                         GETAGE    58
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                10991 FORMAT(R7,R5,R1,R4,R1,A5,2R1,R3,I2,R4,I3,R4,R1,A10,A1,R3,R6,R1,      GETAGE    59
                     1I4,R1,R1,R2)                                                        GETAGE    60
           60        IF (EOF(7)) 10900,10180                                              GETAGE    61
                10180 IF((IORGO.NE.1R1).A.(IORGO.NE.1R3)) GO TO 10380                     GETAGE    62
                      IF (IEQPCLS.EQ.0) IEQPCLS=LSUF                                      GETAGE    63
                      IF (IEQPCLS.NE.LSUF) GO TO 10900                                    GETAGE    64
                      IF (LSUF.NE.MDS) PRINT 10181,LSUE,MDS                               GETAGE    65
           65         10181 FORMAT(' WARNING! THIS RUN IS FOR EQUIPMENT CLASS CODE ', R2,  GETAGE    66
                     1' RATHER THAN FOR ',R2)                                             GETAGE    67
                      IA=IA+1                                                             GETAGE    68
                      IF (LT.EQ.1RZ) GO TO 10380                                          GETAGE    69
                      DECODE(10,55,LWUC) LO                                               GETAGE    70
           70         55 FORMAT(R1,9X)                                                    GETAGE    71
                      IF ((LO.LT.1RA).O.(LO.GT.1R0)) GO TO 10380                          GETAGE    72
                      IC=IC+1                                                             GETAGE    73
                      IF (WUCKEEP(1).EQ.3R000) GO TO 90115                                GETAGE    74
                      DECODE (5,90111,LWUC) CHEKWUC                                       GETAGE    75
           75         90111 FORMAT(R3,2X)                                                 GETAGE    76
                      DO 90112 I1=1,10                                                    GETAGE    77
                      IF (WUCKEEP(I1).EQ.CHEKWUC) GO TO 90115                             GETAGE    78
                      IF (WUCKEEP(I1).EQ.3R   ) GO TO 10000                               GETAGE    79
                90112 CONTINUE                                                            GETAGE    80
           80         GO TO 10000                                                         GETAGE    81
                90115 SCOUNT=0                                                            GETAGE    82
                      IE=IE+1                                                             GETAGE    83
                      LSTDAY=LDAY                                                         GETAGE    84
                      IF (LSTOP.LE.LSTRT) LSTDAY=LSTDAY-1                                 GETAGE    85
           85         I = LWC.A.77777700008                                               GETAGE    86
                      DO 10225 I1=1,IWCS                                                  GETAGE    87
                      IF (I.EQ.(IWCID(I1).A.77777700008)) GO TO 10250                     GETAGE    88
                10225 CONTINUE                                                            GETAGE    89
                      GO TO 10380                                                         GETAGE    90
           90         10250 IF ((IWCID(I1).A.77000B).EQ.30000B) GO TO 10350               GETAGE    91
                      I=LWC.A.77000B                                                      GETAGE    92
                      IF (I.EQ.(IWCID(I1).A.77000B)) GO TO 10380                          GETAGE    93
                10275 I1=I1+1                                                             GETAGE    94
                      IG=IG+1                                                             GETAGE    95
           95         IF (I1.GT.IWCS) GO TO 10380                                         GETAGE    96
                      IF ((LWC.A.77777777000B).NE.(IWCID(I1).A.77777777000B)) GO TO 10275 GETAGE    97
                10300 IF ((IWCID(I1).A.1R1).EQ.1RX) GO TO 10350                           GETAGE    98
                      I=LWC.A.1R1                                                         GETAGE    99
                      IF (I.EQ.(IWCID(I1).A.1R1)) GO TO 10350                             GETAGE   100
          100         10325 I1=I1+1                                                       GETAGE   101
                      IF (I1.GT.IWCS) GO TO 10380                                         GETAGE   102
                      IF (LWC.NE.IWCID(I1)) GO TO 10325                                   GETAGE   103
                10350 LWC=IAFSC(I1)                                                       GETAGE   104
                      IF ((LDTCLAS.EQ.1RD).O.(MAL.EQ.3R796).O.(MAL.EQ.3R812)) GO TO       GETAGE   105
          105        110380                                                              GETAGE   106
                      IF (LO.EQ.1R0) GO TO 10700                                          GETAGE   107
                      IF ((LT.EQ.1RP).O.(LT.EQ.1R9).O.(LT.EQ.1RS)) GO TO 10440            GETAGE   108
                10380 IF (ICNT.NE.59) GO TO 40                                            GETAGE   109
                      PRINT 100                                                           GETAGE   110
          110         100 FORMAT(1H1)                                                     GETAGE   111
                      PRINT 200                                                           GETAGE   112
                200   FORMAT(3X,3HJCN,5X,3HLWC,2X,4HLPRE,1X,5HLTAIL,2X,2HLT             GETAGE   113
                     1,2X,4HLWUC,2X,4HLATC,1X,5HLDISC,1X,3HMAL,2X,2HMA,1X                 GETAGE   114
                     2,5HLSTRT,1X,4HLDAY,1X,5HLSTOP,1X,5HLCREW,1X,3HMMM,2X,               GETAGE   115
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                37HEDTCLAS,1X,5HIORCD,1X,4HLSUF)                                  GETAGE   116
                 PRINT 300                                                        GETAGE   117
          300    FORMAT(1X,3H---,5X,3H---,2X,4H----,1X,5H-----,2X,2H--           GETAGE   118
                1,2X,4H----,2X,4H----,1X,5H-----,1X,3H---,2X,2H--,1X             GETAGE   119
                2,5H-----,1X,4H----,1X,5H-----,1X,5H-----,1X,3H---,2X            GETAGE   120
          120   3,7H-------,1X,5H-----,1X,4H----)                                GETAGE   121
                 ICNT=0                                                           GETAGE   122
          40     I=10HUNACCEPTAB                                                 GETAGE   123
                 J=10HLE RECORD                                                  GETAGE   124
                 PRINT 45,JCN,LWC,LPRE,LTAIL,LT,LWUC,LATC,LDISC,MAL              GETAGE   125
          129   1,MA,LSTRT,LDAY,LSTOP,LCREW,MMM,LOTCLAS,IORCD,LSUF,I,J           GETAGE   126
          45     FORMAT(1X,R7,2X,R5,3X,R1,3X,R4,3X,R1,2X,A5,3X,R1                GETAGE   127
                1,4X,R1,3X,R1,2X,I2,2X,R4,2X,I3,2X,R4,3X,R1,3X,I4,4X,R1,        GETAGE   128
                2(4X,R1,4X,R2,2X,2A10)                                           GETAGE   129
                 ICNT=ICNT+1                                                     GETAGE   130
          130    GO TO 10000                                                     GETAGE   131
          10440 IF (IORCD.EQ.1R3) GO TO 10600                                    GETAGE   132
                C  FOR AIRCRAFT HOW MALFUNCTION CODE OF 799 IS ONLY KEPT WHEN THE ACTION GETAGE  133
                C   CODE IS X.  FOR AGE, ALL 799S ARE KEPT.                     GETAGE   134
                C      ON EQUIPMENT COMPUTATION                                  GETAGE   135
          139   NTYPE = 1                                                        GETAGE   136
                IF ((MAL.EQ.3R803).O.(MAL.EQ.3R804)) GO TO 10380                 GETAGE   137
                DO 10500 I=1,12                                                  GETAGE   138
                IF (LATC.EQ.ATCS(I)) GO TO 10550                                 GETAGE   139
          10500 CONTINUE                                                         GETAGE   140
          140   GO TO 10380                                                      GETAGE   141
          10550 IF (I.EQ.3) GO TO 10000                                          GETAGE   142
                IF ((I.NE.1).A.(I.NE.2)) GO TO 10570                             GETAGE   143
                C  GETDATA FOR AIRCRAFT DROPS HOW MALFUNCTION CODES OF 800 AND 805 FOR A GETAGE  144
                C   TAKEN CODES OF P AND R AT THIS POINT.                       GETAGE   145
          149   C  ACTION TAKEN CODES OF QS (INSTALLS) ARE DROPPED AND THE ELAPSED TIME GETAGE  146
                C   PS (REMOVES) ARE DOUBLED IN COMBINE.                        GETAGE   147
                 SCOUNT=MA                                                       GETAGE   148
                10570 IF (MA.GT.1) MA=1                                          GETAGE   149
                 IF (LDISC-69) 10582,10581,10586                                 GETAGE   150
          150   C  WHEN DISC CODE OF  F  IN 3.                                   GETAGE   151
                C  WHEN DISC CODE OF  C  IN 1.                                   GETAGE   152
                10581 MTRXDIS(3)=MTRXDIS(3)+MA                                   GETAGE   153
                 GO TO 10800                                                     GETAGE   154
                10582 IF (LDISC-33) 10590,10583,10584                            GETAGE   155
          155   10583 MTRXDIS(1)=MTRXDIS(1)+MA                                   GETAGE   156
                 GO TO 10800                                                     GETAGE   157
                10584 IF (LDISC-48) 10590,10585                                  GETAGE   158
                C  WHEN DISC CODE OF  D  IN 2.                                   GETAGE   159
                10585 MTRXDIS(2)=MTRXDIS(2)+MA                                   GETAGE   160
          160    GO TO 10800                                                     GETAGE   161
                10586 IF (LDISC-158) 10590,10587                                 GETAGE   162
                C  WHEN DISC CODE OF  M  IN 4.                                   GETAGE   163
                10587 MTRXDIS(4)=MTRXDIS(4)+MA                                   GETAGE   164
                 GO TO 10800                                                     GETAGE   165
          165   C  OTHER WHEN DISC CODES IN 5.                                   GETAGE   166
                10590 MTRXDIS(5)=MTRXDIS(5)+MA                                   GETAGE   167
                 GO TO 10800                                                     GETAGE   168
                C      OFF EQUIPMENT COMPUTATION                                 GETAGE   169
                10600 NTYPE=2                                                    GETAGE   170
          170    IF (IADJUST.EQ.6) NTYPE=6                                       GETAGE   171
                 IF (LATC.GT.1R9.OR.LATC.LT.1R1.AND.LATC.NE.1RD) GO TO 10610     GETAGE   172
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      C     NRTS ITEM                                                    GETAGE  173
            I = 18                                                       GETAGE  174
            GO TO 10800                                                  GETAGE  175
175   10610 DO 10620 I=4,17                                              GETAGE  176
            IF (LATC.EQ.ATCS(I)) GO TO 10650                             GETAGE  177
      10620 CONTINUE                                                     GETAGE  178
            GO TO 10380                                                  GETAGE  179
      10650 IF (I.NE.5) GO TO 10800                                      GETAGE  180
180         IF ((MAL.EQ.3R799).O.(MAL.EQ.3R804).O.(MAL.EQ.3R803)) GO TO 10800 GETAGE 181
            GO TO 10380                                                  GETAGE  182
      C  SERVICE  NTYPE=3 CHECKS                                         GETAGE  183
      10700 NTYPE=3                                                      GETAGE  184
            I=0                                                          GETAGE  185
185   C  THE VARIABLE I POINTS TO THE CODE ASSIGNED IN THE ATCC VECTOR.  GETAGE  186
            IF (LT.EQ.1RA) I=6                                           GETAGE  187
            IF (LT.EQ.1RD) I=5                                           GETAGE  188
            IF (LT.EQ.1RP) I=3                                           GETAGE  189
            IF (LT.EQ.1RS) I=2                                           GETAGE  190
190         IF (I.EQ.0) GO TO 10380                                      GETAGE  191
      10800 IF (LCREW.EQ.1R0 ) GO TO 10380                               GETAGE  192
            IF (MA.LT.5) GO TO 10810                                     GETAGE  193
            IF (ICNT.NE.59) GO TO 10805                                  GETAGE  194
            PRINT 100                                                    GETAGE  195
195         PRINT 200                                                    GETAGE  196
            PRINT 300                                                    GETAGE  197
            ICNT=0                                                       GETAGE  198
      10805 PRINT 45,JCN,LWC,LPRE,LTAIL,LT,LWUC,LATC,LDISC,MAL           GETAGE  199
           1,MA,LSTRT,LDAY,LSTOP,LCREW,MMM,LDTCLAS,IDRCD,LSUF            GETAGE  200
200         ICNT=ICNT+1                                                  GETAGE  201
      10810 IF ((WUCLVL.EQ.5).OR.(I.EQ.18)) GO TO 10825                  GETAGE  202
            IF (WUCLVL.EQ.4) GO TO 10815                                 GETAGE  203
            LWUC=(LWUC.A.3L:::).O.7R00                                   GETAGE  204
            GO TO 10825                                                  GETAGE  205
205   10815 LWUC=(LWUC.A.4L::::).O.6R0                                   GETAGE  206
      10825 CONTINUE                                                     GETAGE  207
      C  CHECK FOR DUPLICATE RECORDS                                     GETAGE  208
            IF (IHDAY.NE.LDAY) GO TO 10850                               GETAGE  209
            IF ((IHSUF.NE.LSUF).O.(IHTAIL.NE.LTAIL)) GO TO 10850         GETAGE  210
210         IF ((IHPRE.NE.LPRE).O.(IHLT.NE.LT)) GO TO 10850              GETAGE  211
            IF ((IHWUC.NE.LWUC).O.(IHATC.NE.LATC)) GO TO 10850           GETAGE  212
            IF ((IHDISC.NE.LDISC).O.(IHMAL.NE.MAL)) GO TO 10850          GETAGE  213
            IF ((IHMMM.NE.MMM).O.(IHWC.NE.LWC)) GO TO 10850              GETAGE  214
            IF ((IHJCN.NE.JCN).O. (IHSTOP.NE.LSTOP)) GO TO 10850         GETAGE  215
215         IF ((IHCREW.NE.LCREW).O.(IHMA.NE.MA)) GO TO 10850            GETAGE  216
            IF ((IHSTRT.NE.LSTRT).O.(IHIDRCD.NE.IDRCD)) GO TO 10850      GETAGE  217
            IF (IHDTCLS.NE.LDTCLAS) GO TO 10850                          GETAGE  218
            GO TO 10000                                                  GETAGE  219
      10850 WRITE (L1,10992) JCN,LTAIL,NTYPE,LWUC,ATCC(I),LWC,LSTDAY,LSTRT, GETAGE 220
220        1LCREW,MA,MMM,LDAY,LSTOP,SCOUNT                               GETAGE  221
            IHTAIL=LTAIL                                                 GETAGE  222
            IHPRE=LPRE                                                   GETAGE  223
            IHLT=LT                                                      GETAGE  224
            IHSUF=LSUF                                                   GETAGE  225
225         IHSTOP=LSTOP                                                 GETAGE  226
            IHWUC=LWUC                                                   GETAGE  227
            IHATC=LATC                                                   GETAGE  228
            IHDISC=LDISC                                                 GETAGE  229
```

```
                IHMAL=MAL                                                       GETAGE  230
210             IHMA=MA                                                         GETAGE  231
                IHMMM=MMM                                                       GETAGE  232
                IHMC=LMC                                                        GETAGE  233
                IHDAY=LDAY                                                      GETAGE  234
                IHSTRT=LSTRT                                                    GETAGE  235
235             IHCREW=LCREW                                                    GETAGE  236
                IHOTCLS=LOTCLAS                                                 GETAGE  237
                IHJCN=JCN                                                       GETAGE  238
                IHIRGD=IRGD                                                     GETAGE  239
                GO TO 10000                                                     GETAGE  240
240       10980 M=M+1                                                           GETAGE  241
                MM=0                                                            GETAGE  242
                IF (M.LE.NTAPE) GO TO 10000                                     GETAGE  243
                BACKSPACE 7                                                     GETAGE  244
                WRITE (L1,10993)                                                GETAGE  245
245             PRINT 10982,MOS                                                 GETAGE  246
      10982 FORMAT(1H1,30X,*UNSCHEDULED ON-EQUIPMENT MAINTENANCE FOR EQUIP. CL  GETAGE  247
                1ASS *,F2)                                                      GETAGE  248
                PRINT 10989                                                     GETAGE  249
                IWUCSUM=0                                                       GETAGE  250
250             DO 10910 J=1,5                                                  GETAGE  251
                PERCENT(J)=0.                                                   GETAGE  252
      10910 IWUCSUM=IWUCSUM+MTRXDIS(J)                                          GETAGE  253
                IF (IWUCSUM.LE.0) STOP                                          GETAGE  254
                DO 10925 J=1,5                                                  GETAGE  255
255   10925 PERCENT(J)=FLOAT(MTRXDIS(J))*100./FLOAT(IWUCSUM)                    GETAGE  256
                PRINT 10990,(MTRXDIS(J),PERCENT(J),J=1,5)                       GETAGE  257
      10989 FORMAT(T5,*WHEN DISC*,T17,*C*,T34,*D*,T45,*F*,T64,*M*,T73,*OTHER*/  GETAGE  258
               1T13,*NO.*,T22,*%*,T28,*NO.*,T37,*%*,T43,*NO.*,T52,*%*,T58,*NO.*,T6 GETAGE  259
               26,*%*,T72,*NO.*,T81,*%*,//)                                     GETAGE  260
260   10990 FORMAT(T11,I6,T18,F5.1,T25,I6,T33,F5.1,T40,I6,T48,F5.1,T55,I6,T62,  GETAGE  261
               2F5.1,T69,I6,T76,F5.1)                                           GETAGE  262
      10992 FORMAT(27,R3,I1,A5,R1,R5,I3,R4,R1,I2,I4,I3,R4,I2)                   GETAGE  263
      10993 FORMAT(10H9999999999  ,35H00000000000000000000000000000000000000)  GETAGE  264
                PRINT*,"IA=",IA,"IC=",IC,"IF=",IE,"IG=",IG                      GETAGE  265
269   C-END FOR GETDATA ROUTINE                                                 GETAGE  266
                END                                                             GETAGE  267
```

APPENDIX C: AGEBINE DISCUSSION AND LISTING

The change in COMBINE (AFHRL-TR-74-97(III)) for SE was in the interpretation of the header card. The input for the ratio of ELAPSED TIME/MA is listed for on-equipment, off-equipment, and then for *service* type maintenance.

```
PROGRAM AGEBINE    74/74   OPT=1                    FTN 4.5+414        01/04/77  15.49.43        PAGE     1

      1                 PROGRAM AGEBINF(OUTPUT,INPUT,TAPE1,TAPE2,TAPE5=INPUT,TAPE6=OUTPUT  11NOV6      1
                       1,TAPE58)                                                            11NOV6      2
                  C    READ RECORDS SORTED ON FIRST PASS AND COMBINE THEM                   AGEBIN      3
                  C    COMPUTE CREW SIZE AND ELAPSED TIME                                   AGEBIN      4
      5           C    DEVELOP WORK CENTER CODE WHERE MORE THAN ONE INVOLVED                AGEBIN      5
                  C    COMBINE-PARAMETER TELLS WHERE FILE CAN BE FOUND SHOULD               AGEBIN      6
                  C    BE UNITS 1 OR 3                                                      AGEBIN      7
                  C                                                                         AGEBIN      8
                       DIMENSION INFO(5,6,4),IAFSC(45),INDEX(4),NOM(3)                      AGEBIN      9
     10                INTEGER TIME,SCOUNT,HSCOUNT,HJCN,WUC,ACT,DAY,WC,CREW,STRTHR,STRTMI   AGEBIN     10
                      1N,STPHR,STPMIN,HWUC,ELAP,HACT,WCS(4,6),CNTACT(6),STPDAY              AGEBIN     11
                       LOGICAL FLAG                                                         AGEBIN     12
                       DATA CNTACT/6*0/                                                     AGEBIN     13
                       ISUMS=0                                                              AGEBIN     14
     15                ISUMMS=0                                                             AGEBIN     15
                       DO 12000 K=1,4                                                       AGEBIN     16
                       DO 12000 I=1,6                                                       AGEBIN     17
                       WCS(K,I)=0                                                           AGEBIN     18
                       DO 12000 J=1,5                                                       AGEBIN     19
     20          12000 INFO(J,I,K)=0                                                        AGEBIN     20
                  C  THIS INPUT OF THE UPPER LIMIT FOR THE RATIO OF ELAPSED TIME AND MA PE  AGEBIN     21
                  C  MAINTENANCE TYPE IS IN TENTHS OF HOURS (IE, MULTIPLY BY TEN THEN INPU  AGEBIN     22
                  C  INTEGER).                                                              AGEBIN     23
                  C  MAINTENANCE FILE TYPES: 1 ON-EQUIPMENT, 2 OFF-EQUIPMENT, 3 SERVICE     AGEBIN     24
     25                READ 12001,LIMONEQ,LIMOFEQ,LIMSERV                                   AGEBIN     25
                 12001 FORMAT(3I5)                                                          AGEBIN     26
                       DO 12003 I=1,45                                                      AGEBIN     27
                       READ(50,12002) IAFSC(I),NOM                                          11NOV6      3
                 12002 FORMAT(R5,2A10,A6)                                                   AGEBIN     29
     30                IF(EOF(50))12004,12003                                               11NOV6      4
                 12004 NAFSC=I-1                                                            AGEBIN     31
                       GO TO 12005                                                          AGEBIN     32
                 12003 PRINT 12006,I,IAFSC(I),NOM                                           AGEBIN     33
                 12006 FORMAT(10X,I2,R10,5X,2A10,A6)                                        AGEBIN     34
     35                NAFSC=45                                                             AGEBIN     35
                 12005 IX=3R                                                                AGEBIN     36
                       LF = 2                                                               AGEBIN     37
                       L1=1                                                                 AGEBIN     38
                       READ(LF,12993) HJCN,WUC,ACT,WC,DAY,STRTHR,STRTMIN,CREW,MA,LH,STPDA   AGEBIN     39
     40                1Y,STPHR,STPMIN,SCOUNT                                               AGEBIN     40
                       IF (SCOUNT.GT.0) ISUMS=ISUMS+1                                       AGEBIN     41
                       GO TO 12500                                                          AGEBIN     42
                 12050 READ(LF,12993)  JCN,WUC,ACT,WC,DAY,STRTHR,STRTMIN,CREW,MA,LH,STPDA   AGEBIN     43
                      1Y,STPHR,STPMIN,SCOUNT                                                AGEBIN     44
     45                IF (EOF(LF)) 12900,12075                                             AGEBIN     45
                 12075 CONTINUE                                                             AGEBIN     46
                       IF (SCOUNT.GT.0) ISUMS=ISUMS+1                                       AGEBIN     47
                       IF (JCN.EQ.HJCN) GO TO 12100                                         AGEBIN     48
                       HJCN = JCN                                                           AGEBIN     49
     50                GO TO 12150                                                          AGEBIN     50
                 12100 IF (WUC.EQ.HWUC) GO TO 12550                                         AGEBIN     51
                 12150 KKK=SHIFT(HWUC,-30).A.1R1                                            AGEBIN     52
                       IF ((HACT.NE.5).O.(KKK.EQ.1R2)) GO TO 12153                          AGEBIN     53
                       ELAP=ELAP*2                                                          AGEBIN     54
     55                MAN=MAN*2                                                            AGEBIN     55
                 12153 IF (ELAP.GT.0) GO TO 12151                                           AGEBIN     56
                       PRINT 13000,ELAP,HACT,MAN,SUM2,HWUC,HJCN,WCS(IWC,HACT)               AGEBIN     57
```

```
                INFO(1,HACT,IWC)=0                                                  AGERIN   58
                WCS(IWC,HACT)=0                                                     AGERIN   59
 60             GO TO 12154                                                         AGERIN   60
          12151 CONTINUE                                                           AGERIN   61
                C  ROUNDS UP FRACTIONAL MANNING                                    AGERIN   62
                T = FLOAT(MAN)/FLOAT(ELAP)                                         AGERIN   63
                J = T                                                              AGERIN   64
 65             IF (T-FLOAT(J) .NE. 0) J = J+1                                      AGERIN   65
                CONTINUE                                                           AGERIN   66
                INFO(1,HACT,IWC)=J                                                 AGERIN   67
                INFO(2,HACT,IWC)=MAN                                               AGERIN   68
                INFO(3,HACT,IWC)=ELAP                                              AGERIN   69
 70             INFO(4,HACT,IWC)=SUM2                                               AGERIN   70
                INFO(5,HACT,IWC)=HSCOUNT                                           AGERIN   71
          12154 IF (KKK.NE.1R2) GO TO 12210                                        AGERIN   72
                ICHECK=0                                                           AGERIN   73
                DO 12175 K=1,4                                                     AGERIN   74
 75             IF (INFO(1,4,K).LE.0) GO TO 12180                                   AGERIN   75
                IF (INFO(4,4,K).GT.0) GO TO 12175                                  AGERIN   76
                DO 12160 I=1,4                                                     AGERIN   77
                IF (INFO(1,3,I).LE.0) GO TO 12170                                  AGERIN   78
                IF (WCS(I,3).EQ.WCS(K,4)) GO TO 12170                              AGERIN   79
 80       12160 CONTINUE                                                           AGERIN   80
                LLL=3                                                              AGERIN   81
                PRINT 12165,HWUC,KKK,WCS(K,4),(INFO(J,4,K),J=1,4),LLL              AGERIN   82
          12165 FORMAT(* WARNING: TOO MANY WORKS CENTERS IN TEAM)  WUC = *,R5,*     AGERIN   83
               1TYPE = *,R1,*  AFSC = *,R5,*  CREW SIZE = *,I1/*  MMH'S = *,I5,    AGERIN   84
 85            2*  ELAPS TIME (1/10 HRS) = *,I5,*  MA'S = *,I4,*  ACT = *,I1)     AGERIN   85
                INFO(1,4,K)=0                                                      AGERIN   86
                WCS(K,4)=0                                                         AGERIN   87
                GO TO 12175                                                        AGERIN   88
          12170 IF (INFO(1,4,K).GT.INFO(1,3,I)) INFO(1,3,I)=INFO(1,4,K)            AGERIN   89
 90             INFO(2,3,I)=INFO(2,3,I)+INFO(2,4,K)                                 AGERIN   90
                INFO(3,3,I)=INFO(3,3,I)+INFO(3,4,K)                                AGERIN   91
                INFO(1,4,K)=0                                                      AGERIN   92
                WCS(I,3)=WCS(K,4)                                                  AGERIN   93
                WCS(K,4)=0                                                         AGERIN   94
 95             IF (ICHECK.EQ.1) GO TO 12175                                        AGERIN   95
                IX1=1                                                              AGERIN   96
          12171 IF ((CNTACT(IX1).EQ.3).O.(CNTACT(IX1).EQ.0)) GO TO 12172           AGERIN   97
                IX1=IX1+1                                                          AGERIN   98
                IF (IX1.LE.6) GO TO 12171                                          AGERIN   99
100             STOP 7777                                                          AGERIN  100
          12172 CNTACT(IX1)=3                                                      AGERIN  101
                ICHECK=1                                                           AGERIN  102
          12175 CONTINUE                                                           AGERIN  103
          12180 DO 12200 I=1,4                                                     AGERIN  104
105             IF (INFO(1,3,I).LE.0) GO TO 12210                                  AGERIN  105
                INFO(4,3,I)=1                                                      AGERIN  106
                LLL=4                                                              AGERIN  107
          12185 DO 12190 K=1,4                                                     AGERIN  108
                IF (WCS(I,3).EQ.WCS(K,LLL)) GO TO 12195                            AGERIN  109
110       12190 CONTINUE                                                           AGERIN  110
                IF (LLL.EQ.6) GO TO 12200                                          AGERIN  111
                LLL=6                                                              AGERIN  112
                GO TO 12185                                                        AGERIN  113
          12195 IF (INFO(1,LLL,K).LT.INFO(1,3,I)) INFO(1,LLL,K)=INFO(1,3,I)        AGERIN  114
```

```
                      INFO(2,LLL,K)=INFO(2,LLL,K)+INFO(2,3,I)                    AGEBIN  115
                      INFO(3,LLL,K)=INFO(3,LLL,K)+INFO(3,3,I)                    AGEBIN  116
                      IF (INFO(4,LLL,K).LE.0) INFO(4,LLL,K)=1                    AGEBIN  117
                      INFO(1,3,I)=WCS(I,3)=0                                     AGEBIN  118
                12200 CONTINUE                                                   AGEBIN  119
120             12210 IX1=1                                                      AGEBIN  120
                12220 I=CNTACT(IX1).A.7B                                         AGEBIN  121
                      IF (I.LE.0) GO TO 12460                                    AGEBIN  122
                      IF (KKK.EQ.192) GO TO 12250                                AGEBIN  123
                12225 IF (WCS(2,I).LE.0) GO TO 12300                             AGEBIN  124
125             12235 INDEX(1)=INDEX(2)=INDEX(3)=INDEX(4)=1R                     AGEBIN  125
                      MAXELAP=0                                                  AGEBIN  126
                      ISUMCRW=0                                                  AGEBIN  127
                      J=0                                                        AGEBIN  128
                      DO 12237 K=1,4                                             AGEBIN  129
130             12236 IF (INFO(1,I,K).LE.0) GO TO 12237                          AGEBIN  130
                      IF (MAXELAP.LT.INFO(3,I,K)) MAXELAP=INFO(3,I,K)            AGEBIN  131
                      INFO(4,I,K)=0                                              AGEBIN  132
                      J=J+1                                                      AGEBIN  133
                      INDEX(J)=K                                                 AGEBIN  134
135                   ISUMCRW=ISUMCRW+INFO(1,I,K)                                AGEBIN  135
                12237 CONTINUE                                                   AGEBIN  136
                12238 FLAG=.F.                                                   AGEBIN  137
                      K=1                                                        AGEBIN  138
                12239 IF (WCS(INDEX(K),I).LE.WCS(INDEX(K+1),I)) GO TO 12240      AGEBIN  139
140                   J=INDEX(K)                                                 AGEBIN  140
                      INDEX(K)=INDEX(K+1)                                        AGEBIN  141
                      INDEX(K+1)=J                                               AGEBIN  142
                      FLAG=.T.                                                   AGEBIN  143
                12240 K=K+1                                                      AGEBIN  144
145                   IF (K.GT.3) GO TO 12241                                    AGEBIN  145
                      IF (INDEX(K+1).NE.1R ) GO TO 12239                         AGEBIN  146
                12241 IF (FLAG) GO TO 12238                                      AGEBIN  147
                      INDEX(1)=WCS(INDEX(1),I)                                   AGEBIN  148
                      DO 12247  K=2,4                                            AGEBIN  149
150                   IF (INDEX(K).EQ.1R ) GO TO 12248                           AGEBIN  150
                      DO 12246 J=1,NAFSC                                         AGEBIN  151
                      IF (WCS(INDEX(K),I).EQ.IAFSC(J)) GO TO 12246               AGEBIN  152
                12245 CONTINUE                                                   AGEBIN  153
                      INDEX(K)=1R                                                AGEBIN  154
155                   GO TO 12247                                                AGEBIN  155
                12246 INDEX(K)=J                                                 AGEBIN  156
                12247 CONTINUE                                                   AGEBIN  157
                12248 J=0                                                        AGEBIN  158
                      K=1                                                        AGEBIN  159
160                   WRITE (L1,12249) INDEX(1),INDEX(2),INDEX(3),INDEX(4),MWUC  AGEBIN  160
                     1,KKK,I,ISUMCRW,J,MAXELAP,K ,J                              AGEBIN  161
                12249 FORMAT(R5,3R1,R5,R1,I1,I2,2I5,I4,I2)                       AGEBIN  162
                      GO TO 12450                                                AGEBIN  163
                12250 IF ((I.NE.3).A.(I.NE.4).A.(I.NE.6)) GO TO 12225            AGEBIN  164
165                   J=0                                                        AGEBIN  165
                      DO 12275 LLL=1,4                                           AGEBIN  166
                12275 IF (INFO(1,I,LLL).GT.0) J=J+1                              AGEBIN  167
                      IF (J-1) 12450,12300,12235                                 AGEBIN  168
                12300 DO 12440 K=1,4                                             AGEBIN  169
170                   IF (INFO(1,I,K).LE.0) GO TO 12440                          AGEBIN  170
                      IF (INFO(4,I,K).LT.0) INFO(4,I,K)=0                        AGEBIN  171
```

```
                      IF (INFO(4,I,K).EQ.0) GO TO 12425                                  AGEBIN   172
                      IF (KKK.NE.1R1) GO TO 12401                                        AGEBIN   173
                      IF (INFO(3,I,K)/INFO(4,I,K).LE.LIMONEQ) GO TO 12425                AGEBIN   174
                170   PRINT 13300,LIMONEQ, WCS(K,I),HWUC,KKK,I,(INFO(J,I,K),J=1,5)       AGEBIN   175
                      GO TO 12440                                                        AGEBIN   176
               12401  IF (KKK.NE.1R2) GO TO 12402                                        AGEBIN   177
                      IF (INFO(3,I,K)/INFO(4,I,K).LE.LIMOFEQ) GO TO 12425                AGEBIN   178
                      PRINT 13300,LIMOFEQ,WCS(K,I),HWUC,KKK,I,(INFO(J,I,K),J=1,5)        AGEBIN   179
                180   GO TO 12440                                                        AGEBIN   180
               12402  IF (KKK.NE.1R3) GO TO 12404                                        AGEBIN   181
                      IF (INFO(3,I,K)/INFO(4,I,K).LE.LIMSERV) GO TO 12425                AGEBIN   182
                      PRINT 13300,LIMSERV,WCS(K,I),HWUC,KKK,I,(INFO(J,I,K),J=1,5)        AGEBIN   183
                      GO TO 12440                                                        AGEBIN   184
                185   PRINT 13400,WCS(K),HWUC,KKK,I,(INFO(J,I,K),J=1,5)                  AGEBIN   185
                      GO TO 12440                                                        AGEBIN   186
               12425  IF ((IX.EQ.1R    ).A.(INFO(4,I,K).LE.0)) GO TO 12440               AGEBIN   187
                      IF (INFO(5,I,K).LE.99) GO TO 11113                                 AGEBIN   188
                      WRITE(6,11112)  INFO(5,I,K)                                        AGEBIN   189
                190   FORMAT(1X,*    INFO(5,I,K)  EXCEEDS 99.    SCOUNT =*,I6)          AGEBIN   190
                      INFO(5,I,K) = 99                                                   AGEBIN   191
               11113  CONTINUE                                                           AGEBIN   192
                      IF (INFO(5,I,K).GT.0) ISUMMS=ISUMMS+1                              AGEBIN   193
                      WRITE (L1,12991) IX,WCS(K,I),HWUC          ,KKK,I,(INFO(J,I,K),J=1,  AGEBIN   194
                195   15)                                                                AGEBIN   195
               12440  CONTINUE                                                           AGEBIN   196
               12450  CONTINUE                                                           AGEBIN   197
                      IX1=IX1+1                                                          AGEBIN   198
                      IF(IX1.LE.6) GO TO 12220                                           AGEBIN   199
                200   DO 12475 KKK=1,6                                                   AGEBIN   200
               12475   CNTACT(KKK)=0                                                     AGEBIN   201
                      DO 12495 K=1,4                                                     AGEBIN   202
                      DO 12485 I=1,6                                                     AGEBIN   203
                      WCS(K,I)=0                                                         AGEBIN   204
                205   DO 12485 J=1,5                                                     AGEBIN   205
               12485  INFO(J,I,K)=0                                                     AGEBIN   206
               12500  HWUC = HUC                                                        AGEBIN   207
                      IWC=0                                                              AGEBIN   208
                      GO TO 12750                                                        AGEBIN   209
                210   IF((IACT.EQ.HACT).A.(HC.EQ.WCS(IWC,HACT)))GO TO 12800              AGEBIN   210
                      IACT=0                                                             AGEBIN   211
                      IF (IACT.NE.HACT) IACT=1                                           AGEBIN   212
                      KKK=SHIFT(HWUC,-30).A.1R?                                          AGEBIN   213
                      IF ((HACT.NE.5).O.(KKK.EQ.1R2)) GO TO 12575                        AGEBIN   214
                215   ELAP=ELAP*2                                                        AGEBIN   215
                      MAN=MAN*2                                                          AGEBIN   216
               12575  IF (ELAP.GT.0) GO TO 12625                                         AGEBIN   217
                      PRINT 12600,WCS(IWC,HACT),    MAN,HACT,HWUC,SUM2                   AGEBIN   218
                      WCS(IWC,HACT)=0                                                    AGEBIN   219
                220   IWC=IWC-1                                                          AGEBIN   220
               12600  FORMAT(* WARNING: ELAPS TIME NOT > 0 FOR WC = *,R5,*  MHH = *,I4,  AGEBIN   221
                     1*  ACT = *,I1,*  WUC = *,R6,* AND MA = *,I2)                       AGEBIN   222
                      GO TO 12700                                                        AGEBIN   223
               C  ROUNDS UP FRACTIONAL MANNING                                           AGEBIN   224
                225   T= FLOAT(MAN)/FLOAT(ELAP)                                          AGEBIN   225
                      J=T                                                                AGEBIN   226
                      IF (T-FLOAT(J).NE.0) J=J+1                                         AGEBIN   227
                      INFO(1,HACT,IWC)=J                                                 AGEBIN   228
```

```
                INFO(2,MACT,INC)=MAN                                    AGEBIN   229
230             INFO(3,MACT,INC)=ELAP                                   AGEBIN   230
                INFO(4,MACT,INC)=SUM2                                   AGEBIN   231
                INFO(5,MACT,INC)=MSCOUNT                                AGEBIN   232
            12700 IF (IACT.EQ.1) INC=0                                  AGEBIN   233
            12750 INC=INC+1                                             AGEBIN   234
235             DO 12760 KKK=1,6                                        AGEBIN   235
                IF (ACT.EQ.CNTACT(KKK)) GO TO 12765                     AGEBIN   236
                IF (CNTACT(KKK).NE.0) GO TO 12760                       AGEBIN   237
                CNTACT(KKK)=ACT                                         AGEBIN   238
                GO TO 12765                                             AGEBIN   239
240         12760 CONTINUE                                              AGEBIN   240
            C  STOP TIME SMALLER THAN START TIME DAYS ADJUSTED IN GETDATA.  AGEBIN   241
            12765 ELAP=(LH+CREW-1)/CREW                                 AGEBIN   242
                MAN=LH                                                  AGEBIN   243
                TIME=1440*STPDAY+60*STPHR+STPMIN                        AGEBIN   244
245             MSCOUNT=SCOUNT                                          AGEBIN   245
                MACT=ACT                                                AGEBIN   246
                SUM2=MA                                                 AGEBIN   247
                IF (INC.LE.4) GO TO 12775                               AGEBIN   248
                KKK=SHIFT(MWUC,-30).A.1R1                               AGEBIN   249
250             PRINT 12165,MWUC,KKK,WC,J,MAN,ELAP,SUM2,MACT            AGEBIN   250
                ELAP=0                                                  AGEBIN   251
                GO TO 12050                                             AGEBIN   252
            12775 WCS(INC,MACT)=WC                                      AGEBIN   253
                GO TO 12050                                             AGEBIN   254
255         C  JCN,TYPE,WUC,ACT, AND WC'S ARE THE SAME AS PREVIOUS RECORD   AGEBIN   255
            12800 MSCOUNT = MSCOUNT + SCOUNT                            AGEBIN   256
                MIN = 1440*DAY+60*STRTHR+STRTMIN                        AGEBIN   257
                MAN = MAN + LH                                          AGEBIN   258
                IF (SUM2.LT.MA) SUM2=MA                                 AGEBIN   259
260             IF (MIN.GE.TIME) GO TO 12850                            AGEBIN   260
                MIN=1440*STPDAY+60*STPHR+STPMIN                         AGEBIN   261
                IF (MIN.LE.TIME) GO TO 12050                            AGEBIN   262
                ELAP = ELAP + (MIN-TIME)/6                              AGEBIN   263
                GO TO 12050                                             AGEBIN   264
265         12850 ELAP = ELAP+ (LH+CREW-1)/CREW                         AGEBIN   265
                GO TO 12050                                             AGEBIN   266
            12900 WRITE (L1,12992)                                      AGEBIN   267
                PRINT 101,ISUMS,ISUMMS                                  AGEBIN   268
              101 FORMAT (* COMBINE ISUMS=*,I10,*ISUMMS=*,I10)          AGEBIN   269
270             ENDFILE L1                                              AGEBIN   270
            C                                                           AGEBIN   271
            12991 FORMAT(R1,2R5,R1,I1,I2,2I5,I4,I2)                     AGEBIN   272
            12992 FORMAT(11H:::99999999,22H0000000000000000000000)      AGEBIN   273
            12993 FORMAT(R10,R6,R1,R5,I3,2I2,I1,I2,I4,I3,3I2)           AGEBIN   274
275         13000 FORMAT(//5X*ELAP=*,I2,3X*MACT=*,I2,3X*MAN=*,I2,3X*MA=*,F4.1,3X*MWU AGEBIN   275
                1C=*,R5,3X*MJCN=*,R10,3X*WCS=*,R8)                      AGEBIN   276
            13300 FORMAT(* ELAP/MA>*,I5,* SO THE FOLLOWING RECORD WAS DROPPED*,9XR8, AGEBIN   277
                13XR5,3XR1,3XI1,3XI2,3XI5,3XI5,3XI4,3XI2)               AGEBIN   278
            13400 FORMAT(* WARNING- THE FOLLOWING RECORD DID NOT HAVE AN ACCEPTABLE AGEBIN   279
280             1FILE TYPE (IE. 1- ON EQUIP, 2- OFF EQUIP, OR 3- SERV):* AGEBIN   280
                2   /1X,R8,R5,R1,I1,I2,2I5,I4,2I2)                      AGEBIN   281
            C                                                           AGEBIN   282
            C     END FOR COMBINE                                       AGEBIN   283
                  END "ABSENT"
```

APPENDIX D: REPAGE DISCUSSION AND LISTING

REPORT (AFHRL-TR-97(III)) was altered to allow the SE SERVICE file to split out 4 instead of 3 action types (based on the LT in GETAGE).

```
PROGRAM REPAGE     76/76   OPT=1                    FTN 4.5+414      01/04/77  15.59.41      PAGE     1

      1            PROGRAM REPAGE(OUTPUT,INPUT,TAPE2,TAPE8,TAPE9,TAPE10,TAPE11,      REPAGE     2
                  1TAPE12)                                                           REPAGE     3
                C TAPE2 IS DISK FILE FROM SORTED COLLECT PROGRAM OUTPUT               REPAGE     4
                C TAPE8-TAPE11 ARE FILES FOR EACH TYPE                               REPAGE     5
      9         C TAPE12 IS OUTPUT FILE FOR DATA BY WUC.ONE RECORD FOR EACH          REPAGE     6
                C WUC ENTERED IN TAPE12 - SPEC FILE                                  REPAGE     7
                  DIMENSION INFO1(1000),          INFO3(1000),                       REPAGE     8
                 1INFO4(1000),INFO5(1000),INFO6(1000),INFO7(1000),                   REPAGE     9
                 2INFO9(1000),MMRCD(7),RCD1(5,7),RCD2(5,7)                           REPAGE    10
     10           COMMON/LIMIT/MTYPE                                                 REPAGE    11
                  INTEGER SCOUNT2,Y13,CHECK3,Y1,Y14,CHECK,CHECK4,SCOUNT,SCOUNT5,     REPAGE    12
                 1SCOUNT4,WUC4,MWUC4,WUC5,MWUC5,TYPE,MTYPE,WCID,MWCID,MWUC3          REPAGE    13
                 2,FLAP,CREW,ACT,RCD1,RCD2,ZERO(77),A1(2),A2(7),A3(7),A4(7),A5(7)    REPAGE    14
                  LOGICAL WUC3SW,WUC4SW,NORCDS                                       REPAGE    15
     15           EQUIVALENCE (ZERO(1),MMRCD(1)),(ZERO(8),RCD1(1,1)),                REPAGE    16
                 1(ZERO(43),RCD2(1,1))                                               REPAGE    17
                  ISUM5=0                                                            REPAGE    18
                  ISUM1=0                                                            REPAGE    19
                C                                                                    REPAGE    20
     20           CHECK=NRTS=Y1=CHECK4=NRTS4=Y14=MWUC4=SCOUNT5=SCOUNT4=SCOUNT3=NRTS3 REPAGE    21
                 1=Y13=CHECK3=0                                                      REPAGE    22
                  NRTS1=NRTS14=NRTS13=0                                              REPAGE    23
                  ICOUNT5=ICOUNT4=ICOUNT3=0                                          REPAGE    24
                  WUC4SW=WUC3SW=NORCDS=.TRUE.                                        REPAGE    25
     25           DO 17001 I=1,77                                                    REPAGE    26
           17001  ZERO(I)=0                                                          REPAGE    27
                  L2=12                                                              REPAGE    28
                  LF=2                                                               REPAGE    29
                  READ (LF,17995) WUC4,WUC5,TYPE,WCID,ACT,CREW,MMM,  MA,ELAP,SCOUNT  REPAGE    30
     30           IF (SCOUNT.GT.0) ISUM5=ISUM5+1                                     REPAGE    31
                  MWUC3=WUC4.A.7777770000                                            REPAGE    32
                  MWUC4=WUC4                                                         REPAGE    33
                  MWUC5=WUC5                                                         REPAGE    34
                  MTYPE=TYPE.A.70                                                    REPAGE    35
     35           MWCID=WCID.A.8R????????                                            REPAGE    36
                  L1=7+TYPE                                                          REPAGE    37
                  GO TO 17010                                                        REPAGE    38
           17000  READ (LF,17995) WUC4,WUC5,TYPE,WCID,ACT,CREW,MMM,  MA,ELAP,SCOUNT  REPAGE    39
                  IF (IOCHEC(LF)) 17000,8                                            REPAGE    40
     40         8  CONTINUE                                                          REPAGE    41
                  IF (EOF(LF)) 17000,17010                                           REPAGE    42
           17010  CONTINUE                                                          REPAGE    43
                  IF (SCOUNT.GT.0) ISUM5=ISUM5+1                                     REPAGE    44
                  IF ((WUC4.EQ.4R2300).A.(TYPE.EQ.2)) CREW = MA=ELAP=0               REPAGE    45
     45           IF (WUC4.EQ.MWUC4) GO TO 17020                                     REPAGE    46
                  WUC4SW=.FALSE.                                                     REPAGE    47
                  IF ((WUC4.A.7777770000).NE.MWUC3) WUC3SW = .F.                     REPAGE    48
                  GO TO 17030                                                        REPAGE    49
           17020  IF (WUC5.EQ.MWUC5) GO TO 17060                                    REPAGE    50
     50    17030  IF(ICOUNT5.GE.9999)ICOUNT5=9939                                   REPAGE    51
                  WRITE (L2,17994) MWUC4,MWUC5,CHECK,NRTS,NRTS1,Y1,                  REPAGE    52
                 1SCOUNT5,ICOUNT5                                                    REPAGE    53
                  Y14=Y14+Y1                                                         REPAGE    54
                  CHECK4=CHECK4+CHECK                                                REPAGE    55
     55           NRTS14=NRTS14+NRTS1                                                REPAGE    56
                  NRTS4=NRTS4+NRTS                                                   REPAGE    57
                  SCOUNT4 = SCOUNT4 + SCOUNT5                                        REPAGE    58
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                ICOUNT4=ICOUNT4+ICOUNT5                                 REPAGE     59
                ICOUNT5=0                                               REPAGE     60
   60           SCOUNT5=NRTS=CHECK=Y1=NRTS1=0                           REPAGE     61
                GO TO 17079                                             REPAGE     62
          17060 IF (TYPE.NE.HTYPE) GO TO 17070                          REPAGE     63
                IF (NCID.EQ.HWCID) GO TO 17210                          REPAGE     64
          17070 IF (NORCDS) GO TO 17120                                 REPAGE     65
   65           K2=0                                                    REPAGE     66
                K1=SHIFT(HTYPE,48).OR.HWCID                             REPAGE     67
                IF (HTYPE.NE.2) GO TO 17071                             REPAGE     68
                NI = 7                                                  REPAGE     69
                NJ = 4                                                  REPAGE     70
   70           GO TO 17072                                             REPAGE     71
          17071 IF (HTYPE.EQ.3) GO TO 17073                             REPAGE     72
                NI=4                                                    REPAGE     73
                NJ = 5                                                  REPAGE     74
                GO TO 17072                                             REPAGE     75
   75     17073 NI=4                                                    REPAGE     76
                NJ=5                                                    REPAGE     77
          17072 DO 17080 I = 1,NI                                       REPAGE     78
                K2=NHRCD(I)                                             REPAGE     79
                DO 17080 J = 1,NJ                                       REPAGE     80
   80           IF ((RCD1(J,I).EQ.0).A.(K2.EQ.0).A.(RCD2(J,I).EQ.0)) GO TO 17080  REPAGE  81
                IF (NWUC4.GE.999) GO TO 17075                           REPAGE     82
                NWUC4=NWUC4+1                                           REPAGE     83
                INFO1(NWUC4)=K1                                         REPAGE     84
                INFO3(NWUC4)=K2                                         REPAGE     85
   85           K2=0                                                    REPAGE     86
                INFO4(NWUC4)=I                                          REPAGE     87
                INFO5(NWUC4)=J                                          REPAGE     88
                INFO6(NWUC4)=RCD1(J,I)                                  REPAGE     89
                INFO7(NWUC4)=RCD2(J,I)                                  REPAGE     90
   90           INFO9(NWUC4)=NWUC4                                      REPAGE     91
                GO TO 17080                                             REPAGE     92
          17075 PRINT 17990,K1    ,K2,RCD1(J,I),RCD2(J,I),NWUC4,NWUC5   REPAGE     93
          17080 CONTINUE                                                REPAGE     94
                CALL CLEANUP                                            REPAGE     95
   95           IF ((HTYPE.LE.0).OR.(HTYPE.GT.5)) HTYPE=5               REPAGE     96
                GO TO (17090,17100,17110,17090,17120),HTYPE             REPAGE     97
          17090 WRITE (L1,17991) NWUC4,NWUC5,HWCID,                     REPAGE     98
               1(NHRCD(I),(RCD1(J,I),RCD2(J,I),J=1,5),I=1,4)            REPAGE     99
                GO TO 17120                                             REPAGE    100
  100     17100 WRITE (L1,17992) NWUC4,NWUC5,HWCID,(NHRCD(I)            REPAGE    101
               1,(RCD1(J,I),RCD2(J,I),J=1,4),I=1,7)                     REPAGE    102
                GO TO 17120                                             REPAGE    103
          17110 WRITE (L1,17991) NWUC4,NWUC5,HWCID,                     REPAGE    104
               1(NHRCD(K1),(RCD1(J,K1),RCD2(J,K1),J=1,5),K1=1,4)        REPAGE    105
  105     17120 IF (NUC4SW) GO TO 17210                                 REPAGE    106
                CALL SORT(INFO1,INFO9,NWUC4)                            REPAGE    107
                NWUC4=NWUC4+1                                           REPAGE    108
                INFO1(NWUC4)=9R999999999                                REPAGE    109
                INFO9(NWUC4)=NWUC4                                      REPAGE    110
  110           DO 17130 I=1,77                                         REPAGE    111
          17130 ZERO(I)=0                                               REPAGE    112
                NWUC5=1R                                                REPAGE    113
                HWCID=INFO1(INFO9(1)).A.9R111111111                     REPAGE    114
                IF (NWUC4.LE.1000) GO TO 17131                          REPAGE    115
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```
                      PRINT 1,NWUC4                                              REPAGE   116
                    1 FORMAT(1X,*NWUC4.GT.1000 -- *,I10)                         REPAGE   117
                      NWUC4=1000                                                 REPAGE   118
                17131 DO 17200 I=1,NWUC4                                         REPAGE   119
                      K1=INFO3(I).A.777777778                                    REPAGE   120
                      IF (K1.LE.1000) GO TO 17132                                REPAGE   121
                      PRINT 2,K1                                                 REPAGE   122
                    2 FORMAT(* K1.GT.1000 -- *,I10)                              REPAGE   123
                      GO TO 17200                                                REPAGE   124
                17132 IF ((INFO1(K1).A.9R1111111111).NE.HWCID) GO TO 17140       REPAGE   125
                17134 K2=INFO4(K1).A.778                                         REPAGE   126
                      IF (K2.LE.7) GO TO 17136                                   REPAGE   127
                      PRINT 3,K2                                                 REPAGE   128
                    3 FORMAT(* K2.GT.7 -- *,I10)                                 REPAGE   129
                      GO TO 17200                                                REPAGE   130
                17136 K3 = INFO5(K1).A.78                                        REPAGE   131
                      IF (K3.LE.5) GO TO 17137                                   REPAGE   132
                      PRINT 4,K3                                                 REPAGE   133
                    4 FORMAT(* K3.GT.5 -- *,I10)                                 REPAGE   134
                      GO TO 17200                                                REPAGE   135
                17137 MHRCD(K2)=MHRCD(K2)+INFO3(K1)                              REPAGE   136
                      RCD1(K3,K2)=RCD1(K3,K2)+INFO6(K1)                          REPAGE   137
                      RCD2(K3,K2)=RCD2(K3,K2)+INFO7(K1)                          REPAGE   138
                      GO TO 17200                                                REPAGE   139
                17140 MTYPE=SHIFT(HWCID,-48).A.78                                REPAGE   140
                      L1 = 7+MTYPE                                               REPAGE   141
                      CALL CLEANUP                                               REPAGE   142
                      IF ((MTYPE.LE.0).OR.(MTYPE.GT.5)) MTYPE=5                  REPAGE   143
                      GO TO (17150,17150,17170,17150,17180),MTYPE                REPAGE   144
                17150 WRITE (L1,17991) HWUC4,HWUC5,HWCID,                        REPAGE   145
                     1(MHRCD(K1),(RCD1(J,K1),RCD2(J,K1),J=1,5),K1=1,4)           REPAGE   146
                      GO TO 17180                                                REPAGE   147
                17160 WRITE (L1,17992) HWUC4,HWUC5,HWCID,(MHRCD(K1)              REPAGE   148
                     1,(RCD1(J,K1),RCD2(J,K1),J=1,4),K1=1,7)                     REPAGE   149
                      GO TO 17180                                                REPAGE   150
                17170 WRITE (L1,17991) HWUC4,HWUC5,HWCID,                        REPAGE   151
                     1(MHRCD(K1),(RCD1(J,K1),RCD2(J,K1),J=1,9),K1=1,4)           REPAGE   152
                17180 K1 = INFO9(I).A.4R::::                                     REPAGE   153
                      HWCID=INFO1(K1).A.9R::::::::::                             REPAGE   154
                      DO 17190 J=1,77                                            REPAGE   155
                17190 ZERO(J)=0                                                  REPAGE   156
                      IF (I.LT.NWUC4) GO TO 17135                                REPAGE   157
                17200 CONTINUE                                                   REPAGE   158
                      NWUC4=0                                                    REPAGE   159
                      IF(ICOUNT4.GE.9999)ICOUNT4=9999                            REPAGE   160
                      WRITE (L2,17994) HWUC4,HWUC5,CHECK4,NRTS4,NRTS14,Y14       REPAGE   161
                     1,SCOUNT4,ICOUNT4                                           REPAGE   162
                      ICOUNT3=ICOUNT3+ICOUNT4                                    REPAGE   163
                      ICOUNT4=0                                                  REPAGE   164
                      SCOUNT3=SCOUNT3+SCOUNT4                                    REPAGE   165
                      Y13=Y13+Y14                                                REPAGE   166
                      NRTS3=NRTS3+NRTS4                                          REPAGE   167
                      NRTS13=NRTS13+NRTS14                                       REPAGE   168
                      CHECK3=CHECK3+CHECK4                                       REPAGE   169
                      SCOUNT4=NRTS4=CHECK4=Y14=NRTS14=0                          REPAGE   170
                17210 IF (NWUC3SW) GO TO 17215                                   REPAGE   171
                      IF(ICOUNT3.GE.9999)ICOUNT3=9999                            REPAGE   172
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                      MWUC3=MWUC3.O.1R                                          REPASE   173
                      WRITE (L2,17994) MWUC3,MWUC4,CHECK3,NRTS3,NRTS13,Y13,SCOUNT3  REPASE   174
                     1,ICOUNT3                                                  REPASE   175
  170                 ICOUNT3=0                                                 REPASE   176
                      SCOUNT3=NRTS3=CHECK3=Y13=NRTS13=0                         REPASE   177
                17215 IF (MUC4.EQ.4R9999) GO TO 17980                           REPASE   178
                      MWUC3=MUC4.A.777777000                                    REPASE   179
                      MWUC4=MUC4                                                REPASE   180
  180                 MWUC5=MUC5                                                REPASE   181
                      MTYPE=TYPE.A.7R                                           REPASE   182
                      MWCID=WCID.A.8R11111111                                   REPASE   183
                      L1 = 7 + TYPE                                             REPASE   184
                      MUC3SW=MUC4SW=NORCDS=.TRUE.                               REPASE   185
  185                 DO 17220 I=1,77                                           REPASE   186
                17220 ZERO(I)=0                                                 REPASE   187
                17230 CONTINUE                                                  REPASE   188
                C  TYPE = MTYPE, WCID = MWCID                                   REPASE   189
                      NORCDS=.F.                                                REPASE   190
  190                 IF (TYPE.NE.2) GO TO 17275                                REPASE   191
                      IF ((ACT.LE.0).O.(ACT.GT.6)) GO TO 17550                  REPASE   192
                C  SHOP ACTIONS                                                 REPASE   193
                      GO TO (17240,17245,17265,17250,17255,17260),ACT           REPASE   194
                17240 LOCODE=1                                                  REPASE   195
  195                 Y1=Y1+MA                                                  REPASE   196
                      GO TO 17400                                               REPASE   197
                17245 CHECK=CHECK+MA                                            REPASE   198
                      LOCODE=2                                                  REPASE   199
                      GO TO 17400                                               REPASE   200
  200           17250 LOCODE=5                                                  REPASE   201
                      Y1=Y1+MA                                                  REPASE   202
                      GO TO 17400                                               REPASE   203
                17255 LOCODE=4                                                  REPASE   204
                      GO TO 17400                                               REPASE   205
  205           17260 IF (MWUC5.EQ.1R0) GO TO 17261                             REPASE   206
                      LOCODE=7                                                  REPASE   207
                      NRTS1=NRTS1+MA                                            REPASE   208
                      GO TO 17400                                               REPASE   209
                17261 NRTS=NRTS+MA                                              REPASE   210
  210                 LOCODE=6                                                  REPASE   211
                      GO TO 17400                                               REPASE   212
                17265 LOCODE=3                                                  REPASE   213
                      GO TO 17400                                               REPASE   214
                C  ON-EQUIP,ON-ENGINE, AND SCHED. ACTIONS                       REPASE   215
  215           17275 IF ((ACT.LE.0).O.(ACT.GT.4)) GO TO 17550                  REPASE   216
                      GO TO (17300,17310,17320,17330),ACT                       REPASE   217
                17300 LOCODE=1                                                  REPASE   218
                      GO TO 17400                                               REPASE   219
                17310 LOCODE=3                                                  REPASE   220
  220                 GO TO 17400                                               REPASE   221
                17320 LOCODE=4                                                  REPASE   222
                      GO TO 17400                                               REPASE   223
                17330 LOCODE=2                                                  REPASE   224
                      IF (MA.GT.0) ISUMI=ISUMI+1                                REPASE   225
  225                 ICOUNT5=ICOUNT5+MA                                        REPASE   226
                      SCOUNT5=SCOUNT5+SCOUNT                                    REPASE   227
                17400 IF (LOCODE.GT.7) GO TO 17000                              REPASE   228
                      IF (CREW.LE.0) GO TO 17500                                REPASE   229
```

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                  RC01(CREW,LOCODE)=RC01(CREW,LOCODE)+MA                          REPAGE   230
230               RC02(CREW,LOCODE)=RC02(CREW,LOCODE)+FLAP                        REPAGE   231
            17980 MMRC0(LOCODE)=MMRC0(LOCODE)+MMH                                 REPAGE   232
                  GO TO 17000                                                     REPAGE   233
            17950 PRINT 17950,WUC4,WUC5,TYPE,WCID,ACT                             REPAGE   234
            17950 FORMAT(' RECORD DROPPED BECAUSE ACT WAS INVALID.  WUC= ',R4,R1,  REPAGE   235
235               1' TYPE = ',I1,' AFSC =',R8,' ACT = ',I1)                       REPAGE   236
                  GO TO 17000                                                     REPAGE   237
            17980 DO 17981 I = 9,12                                               REPAGE   238
            17981 ENDFILE I                                                       REPAGE   239
                  REWIND 11                                                       REPAGE   240
240               PRINT 181,ISUMS,ISUMI                                           REPAGE   241
              181 FORMAT (' REPORT ISUMS=',I12,'ISUMI=',I10)                      REPAGE   242
                  WRITE (8,17985)                                                 REPAGE   243
            17985 FORMAT(1H9999999999999/68H999999999999999999999999999999999999999999999 REPAGE   244
                  1999999999999999999999999999/68H99999999999999999999999999999 REPAGE   245
245               2999999999999999999999999999999999999/68H999999999999999999999999999 REPAGE   246
                  3999999999999999999999999999999999999999999/68H99999999999999999999999 REPAGE   247
                  4999999999999999999999999999999999999999999)                    REPAGE   248
            17986 READ (11,17989) A1,A2,A3,A4,A5                                  REPAGE   249
                  IF (EOF(11)) 17988,17987                                        REPAGE   250
250         17987 WRITE (8,17989) A1,A2,A3,A4,A5                                  REPAGE   251
                  GO TO 17986                                                     REPAGE   252
            17988 ENDFILE 8                                                       REPAGE   253
                  C                                                               REPAGE   254
            17989 FORMAT (A10,A3/6A10,A6/6A10,A6/6A10,A6/6A10,A6)                 REPAGE   255
255         17991 FORMAT(R4,R1,R8/I8,5(2I6)/I8,5(2I6)/I8,5(2I6)/I8,5(2I6))        REPAGE   256
            17992 FORMAT(R4,R1,R8,I8,4(2I6)/I8,4(2I6),I8,4(2I6)/I8,4(2I6),I8,4(2I6)/ REPAGE   257
                  1I8,4(2I6),I9,4(2I6))                                           REPAGE   258
            17993 FORMAT(R4,R1,R8/I8,5(2I6)/I8,5(2I6)/I8,5(2I6))                  REPAGE   259
            17994 FORMAT(R4,R1,4I9,2I4)                                           REPAGE   260
260         17995 FORMAT(R4,R1,I1,R8,2I1,I8,2I6,I3)                               REPAGE   261
            17996 FORMAT(1X,'WARNING! SCHEDULED MAINTENANCE HAS AN ENTRY',        REPAGE   262
                  1' IN LOOM ',R1,' CREW SIZE MATRIX FOR WUC = ',R4,R1,           REPAGE   263
                  2', AFSC = ',R8,', AND MA = ',I3)                               REPAGE   264
            17999 FORMAT('WARNING- THERE WERE MORE THAN 999 RECORDS WITHIN A LEVEL W REPAGE   265
265               1UC.  THE FOLLOWING RECORD WAS DROPPED'/5X,'TYPE AND AFSC = ',R9, REPAGE   266
                  2', MMH = ',I8,', MA = ',I6,', NO. OF OCCURANCES = ',I6,', ELAP = ' REPAGE   267
                  3,I4,', FOR WUC = ',R4,R1)                                      REPAGE   268
                  C                                                               REPAGE   269
                        END                                                       REPAGE   270
```

APPENDIX E: THREAGE DISCUSSION AND LISTING

THRELVL (AFHRL-TR-74-97(III)) was modified to allow the SERVICE file to have 4 action type breakouts instead of 3.

```
      PROGRAM THREAGE(OUTPUT,TAPE8,TAPE9,TAPE10,TAPE19)                 THRAGE     2
      INTEGER FORMAT1(8),FORMAT2(8),FORMAT3(8),TYPE(2),TYPF(2),TYPG(2)  THRAGE     3
      DATA (TYPF=10HON-EQUIP. ,10HAND ENGINE)                           THRAGE     4
      DATA (TYPF=10HOFF-EQUIPM,10HAINTENANCE)                           THRAGE     5
      DATA (TYPG=10HSCHEDULEDM,10HAINTENANCE)                           THRAGE     6
      DATA (FORMAT1=10H(R5,R8/I8,,10H5(2I6)/I9,,10H5(2I6)/I8,,10H5(2I6)/ THRAGE     7
     1I8,,7L5(2I6)),0B,0B,0B)                                           THRAGE     8
      DATA (FORMAT2=10H(R5,R8,I8,,10H4(2I6)/I8,,10H4(2I6),I8,,10H4(2I6)/ THRAGE     9
     1I8,,10H4(2I6),I8,,10H4(2I6)/I8,,10H4(2I6),I8,,7L4(2I6)))          THRAGE    10
      DATA (FORMAT3=10H(R5,R8/I8,,10H5(2I6)/I8,,10H5(2I6)/I8,,7L5(2I6)), THRAGE    11
     1R8,0B,0B,0B)                                                      THRAGE    12
      PRINT 9,FORMAT1                                                   THRAGE    13
      CALL THREEM(44,FORMAT1)                                           THRAGE    14
      ENDFILE 19                                                        THRAGE    15
C  ON-EQUIPMENT AND ENGINE FILES SUMMARIZED AND MERGED                  THRAGE    16
      PRINT 8,TYPE                                                      THRAGE    17
      PRINT 9,FORMAT2                                                   THRAGE    18
      CALL THREEM(63,FORMAT2)                                           THRAGE    19
      ENDFILE 19                                                        THRAGE    20
C  OFF-EQUIPMENT FILE SUMMARIZED AND MERGED                             THRAGE    21
      PRINT 8,TYPF                                                      THRAGE    22
      PRINT 9,FORMAT1                                                   THRAGE    23
      CALL THREEM(44,FORMAT1)                                           THRAGE    24
      ENDFILE 19                                                        THRAGE    25
C  SCHEDULED-MAINTENANCE FILE SUMMARIZED AND MERGED                     THRAGE    26
      PRINT 8,TYPG                                                      THRAGE    27
      STOP 53771                                                        THRAGE    28
    8 FORMAT(1X,2A10,*   SUMMARIZED AND MERGED*)                        THRAGE    29
    9 FORMAT(1X,*FORMAT USED: *,8A10)                                   THRAGE    30
      END                                                               THRAGE    31
```

APPENDIX F: PRINTAGE DISCUSSIONS AND LISTING

PRINTOUT modifications include QPA set to 1, the header card for each maintenance type file has an equipment class code and up to as many as 14 FIIN codes inputs available when needed for printout purposes only. The SERVICE file only prints out line by line summaries of data by WUC, AFSC, crew size, overtime, MAs per maintenance type, MMH and MMH/100. Further summaries and tables which are given for ON-EQUIPMENT are suppressed. (Also, no longer in overlap format because of the computer system changes.) PRINTAGE is repeated for all of the equipment class codes which were processed through the SE data bank program series in one run.

```
PROGRAM PRNTAGE   74/74  OPT=1                    FTN 4.5+414        01/04/77  16.12.03      PAGE     1

      1           PROGRAM PRNTAGE(INPUT,OUTPUT,TAPE5=INPUT,TAPE8,TAPE9,TAPE10)                  PRAGE     2
                  DIMENSION MMH(7),MA(5,7),ELAP(5,7),NACTS(4),NCREW(4),IUNUSED(263),            PRAGE     3
                 1IFIIN(14)                                                                     PRAGE     4
                  REAL MMH                                                                      PRAGE     5
      5           INTEGER SCOUNT                                                                PRAGE     6
                  INTEGER MASK(3),WUC,WCID,FORMAT(6),BLK(3),OPA,AFSC(3)                         PRAGE     7
                  COMMON/INFO1/WUC,OPA,AFSC,WCID/INFO2/ICHECK,NRTS,NRTS1,Y1,SCOUNT              PRAGE     8
                 1,ICOUNT                                                                       PRAGE     9
                  COMMON/INFO3/MMH,MA,ELAP,LIM1,LIM2,ICOMPAR,FLYHRS,SORTIES,LVL,                PRAGE    10
     10           1IEOF,IFILE                                                                   PRAGE    11
                  COMMON/INFO4/IUNUSED                                                          PRAGE    12
                  DATA NACTS/4,7,4,4/,NCREW/5,4,5,5/,MASK/2R1 ,1R ,1R ,0/,BLK/2R  ,1R ,0        PRAGE    13
                 1/,OPA/1/                                                                      PRAGE    14
                  PRINT 10003,                                                                  PRAGE    15
     15     10003 FORMAT(1H1,T52,*AFSC MASTER LIST FOR TEAMS*//T47,*CHAR.*,T57,*AFSC            PRAGE    16
                 1*,T67,*NOMENCLATURE*)                                                         PRAGE    17
                  DO 10006 I=1,45                                                               PRAGE    18
                  READ (10,10004) WCID,AFSC                                                     PRAGE    19
     20     10004 FORMAT(95,2A10,A6,49X)                                                        PRAGE    20
                  IF (EOF(10)) 10007,10006                                                      PRAGE    21
     10006 PRINT 10005,I,WCID,AFSC                                                              PRAGE    22
     10005 FORMAT(T47,R1,T57,R5,T67,2A10,A6)                                                    PRAGE    23
     10007 REWIND 10                                                                            PRAGE    24
     10001 READ (5,10000) SORTIES,FLYHRS,IFILE,LVLWUC,IEOPCL1,IEOPCL2,                          PRAGE    25
     25    1(IFIIN(I),I=1,14),FORMAT                                                           PRAGE    26
     10000 FORMAT(F10.4,F10.4,2I1,2R1,14(1X,R3)/6A10)                                          PRAGE    27
                  IF (EOF(5)) 10022,10023                                                       PRAGE    28
     10022 STOP 52323                                                                           PRAGE    29
     10023 IF  ((IFILE.LE.0).O.(IFILE.GT.4)) GO TO 10001                                        PRAGE    30
     30           LVLWUC=LVLWUC-2                                                               PRAGE    31
                  IF ((LVLWUC.LT.1).O.(LVLWUC.GT.3)) LVLWUC=3                                   PRAGE    32
                  IEOF=0                                                                        PRAGE    33
                  DO 10026 I=1,263                                                              PRAGE    34
     10026 IUNUSED(I)=0                                                                         PRAGE    35
     35    C  IF FIRST CHAR. OF EQUIPMENT CLASS CODE IS A 0, THEN IT IS A DUMMY                 PRAGE    36
           C  ASSIGNED CODE BASED ON GROUPINGS OF FIIN DESIGNATORS.                             PRAGE    37
                  IF (IEQPCL1.LE.328) GO TO 10160                                               PRAGE    38
                  PRINT 10159,SORTIES, FLYHRS,IFILE,(IFIIN(I),I=1,14)                           PRAGE    39
     10159 FORMAT(*1FOR THIS RUN THERE ARE*,F10.4,* SORTIES AND*,F11.4,* FLYI                    PRAGE    40
     40       1NG HOURS FOR MAINTENANCE TYPE*,I2,* FOR AGE EQUIPMENT WITH*/10X,                  PRAGE    41
              2*FIIN DESIGNATORS LISTED AS: *,14(R3,2X)////)                                    PRAGE    42
                  GO TO 10161                                                                   PRAGE    43
     10160 PRINT 10002,SORTIES,FLYHRS,IFILE,IEQPCL1,IEQPCL2                                     PRAGE    44
     10002 FORMAT(*1FOR THIS RUN THERE ARE*,F10.4,* SORTIES AND*,F11.4,* FLYI                    PRAGE    45
     45       1NG HOURS FOR MAINTENANCE TYPE*,I2,* FOR AGE EQUIPMENT *,2R1////)                 PRAGE    46
     10161 LVL=5                                                                                PRAGE    47
                  LIM1=NACTS(IFILE)                                                             PRAGE    48
                  LIM2=NCREW(IFILE)                                                             PRAGE    49
     10025 READ (8,FORMAT)WUC,WCID,(MMH(I),(MA(J,I),ELAP(J,I),J=1,LIM2),I=1,                    PRAGE    50
     50       1LIM1)                                                                           PRAGE    51
                  IF (ICCHEC(8)) 10025,10030                                                    PRAGE    52
     10030 IF (EOF(8)) 10050,10100                                                              PRAGE    53
     10050 IEOF=1                                                                               PRAGE    54
                  IF (LVL.EQ.5) GO TO 10001                                                     PRAGE    55
     55           IF (IFILE.EQ.2) GO TO 10075                                                   PRAGE    56
                  CALL ONEOP                                                                    PRAGE    57
                  GO TO 10001                                                                   PRAGE    58
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      10075 CALL OFFEQP                                                    PRAGE     59
            GO TO 10001                                                    PRAGE     60
60    10100 IF (WUC.EQ.5R99999) GO TO 10050                                PRAGE     61
            IF ((MASK(LVLWUC).A.WUC).NE.BLK(LVLWUC)) GO TO 10025           PRAGE     62
            IF (IFILE.EQ.2) CALL FNDQPA                                    PRAGE     63
            CALL FNDAFSC                                                   PRAGE     64
            IF ((1R1.A.WUC).EQ.1R ) GO TO 10110                            PRAGE     65
65          ICOMPAR=5                                                      PRAGE     66
            GO TO 10150                                                    PRAGE     67
      10110 IF ((77000.A.WUC).EQ.5500B) GO TO 10125                        PRAGE     68
            ICOMPAR=4                                                      PRAGE     69
            GO TO 10150                                                    PRAGE     70
70    10125 ICOMPAR=3                                                      PRAGE     71
      10150 IF (IFILE.EQ.2) GO TO 10175                                    PRAGE     72
            CALL ONEQP                                                     PRAGE     73
            GO TO 10025                                                    PRAGE     74
      10175 CALL OFFEQP                                                    PRAGE     75
75          GO TO 10025                                                    PRAGE     76
            END                                                            PRAGE     77
```

ABBREVIATIONS AND DEFINITIONS

SYMBOL	DEFINITION
ABD64A	Magnetic computer tapes with recorded maintenance activity.
AGE	Aerospace Ground Equipment
BASIC AGE	Part II of MDCAGE program
BASIC RUN	Part II of MDC program
EQ/CL	Equipment Class Code
LCOM	Logistics Composite Model
MDBF	Mean Dispatches Between Failures
MDC	Maintenance Data Collection
MDCAGE	Maintenance Data Collection Program for SE
MDS	Mission Design Series
MMH	Maintenance Man-Hours
MMM	Maintenance Manpower Models
NIIN	National Item Identification Number
PE	Phase Inspection
PHASE I	An MMM pre-processor model
PRINTAGE	Part III of MDCAGE program
PRINTOUT	Part III of MDC program
SE	Support Equipment
TRNAGE	Part I of MDCAGE program
TRN9T07	Part I of MDC program
UE	Unit Equipment

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