1995

Studies and Analyses Office

Directorate of Plans
HQ Air Force Materiel Command
Wright-Patterson AFB OH 45433

FOREWORD

The AFMC Studies and Analyses Office (AFMC SAO) conducts and sponsors studies and research of significant materiel issues. Our focus is on the development, modification, and application of mathematical models which can help relate resource alternatives to the peacetime readiness and wartime sustainability of AFMC's customers--the operating commands.

This is our twelfth Annual Report. It includes descriptions of the projects we worked on in 1995 and our plan for 1996. If you have any comments, or suggestions for further research, contact us at DSN 787-3201 or commercial 513-257-3201. Our FAX is DSN 986-1498 or commercial 513-476-1498.

Victor J. Presutti Jr.
Statement A Per
4/3/96

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EXECUTIVE SUMMARY

The Studies and Analyses Office (AFMC SAO), formerly the Management Sciences Division (HQ AFMC/XPS), conducts and sponsors studies and research of significant materiel issues. We use, modify, and develop new or improved methods, models, and tools to manage materiel resources.

Our goal is to quantify the relationships between alternative materiel resources and the resultant aircraft availability and sustainability so that AFMC can prioritize and justify its investments in those resources. We work toward this goal by performing studies for our customers and by pursuing a few internally developed projects which have significant potential for providing valuable insights into these relationships.

In 1995 we focused on several major areas. We played a significant role with several aspects of an Air Force/AFMC initiative to improve procurement, repair, and distribution processes to simultaneously reduce resupply times and cut costs ("*Lean Logistics*"). A major accomplishment for Lean Logistics was our work that demonstrated Readiness Based Leveling (RBL) is the most effective method to allocate stockage levels among retail (base) and wholesale (depot) locations ("*Retail and Wholesale Stockage Levels*"). We continued our effort to help AFMC's Air Logistics Centers (ALCs) implement an approach which ensures that the items most in need of repair and/or distribution to support the operators' sortie generation capability will get priority attention ("*DRIVE*"). Extensions of this work were incorporated into the new single system in Lean Logistics for prioritizing depot exchangeable repair called Execution and Prioritization of Repair Support System ("*EXPRESS*"). We also helped an interface between DRIVE and the Stock Control System become the standard process chosen by the Stock Control Reengineering Team for distribution under Lean Logistics ("*Automated DRIVE Distribution*"). We followed up our 1993 and 1994 development work to minimize the negative impact of limited funding and assisted AFMC in reallocating FY 95 and allocating FY 96 spares procurement funds by Air Logistics Center, weapon system, and item ("*RSD Banding*"). We continued working with the Joint Logistics System Center (JLSC) to help define the appropriate multi-echelon spares requirements modeling strategies that will best satisfy the Components' needs ("*JLSC Support*"). We entered new ground and determined a new way to forecast total depot maintenance workload ("*DMBA Workload*"). We made significant progress on developing an availability assessment tool to estimate peacetime supportability of Command, Control, Communication, Computer, and Intelligence systems ("*C4I Model*"). Finally, we assisted several organizations including the F-22 System Program Office with tools to use for determining requirements for initial spares ("*RBS Support*").

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THE STUDIES AND ANALYSES OFFICE

The function of the AFMC Studies and Analyses Office (AFMC SAO) is to provide a source of operations research skills for the Headquarters. Previously we were known as the Management Sciences Division (HQ AFMC/XPS), but on 1 August 1995 we were established as the AFMC Studies and Analyses Office - a Field Operating Agency (FOA) of HQ AFMC/XP. Although we are a part of the Directorate of Plans, we often perform our studies and analyses for clients outside the Directorate.

The majority of our analysts have advanced degrees in technical areas such as operations research, mathematics, engineering, and management sciences. Each new analyst is expected to have, or obtain within a three to four year training period, an appropriate advanced degree.

Our emphasis has been on the application of mathematical modeling techniques to improve the management of materiel resources. We have focused our efforts on the development and enhancement of mathematical models which can relate materiel resource decisions to resultant impacts on aircraft availability so that AFMC can prioritize and justify its investments in those resources. We work toward accomplishing this by performing studies for our customers and by pursuing a few internally developed projects which have significant potential for providing valuable insights into these relationships. The office works closely and shares results with other governmental and private analyses organizations.

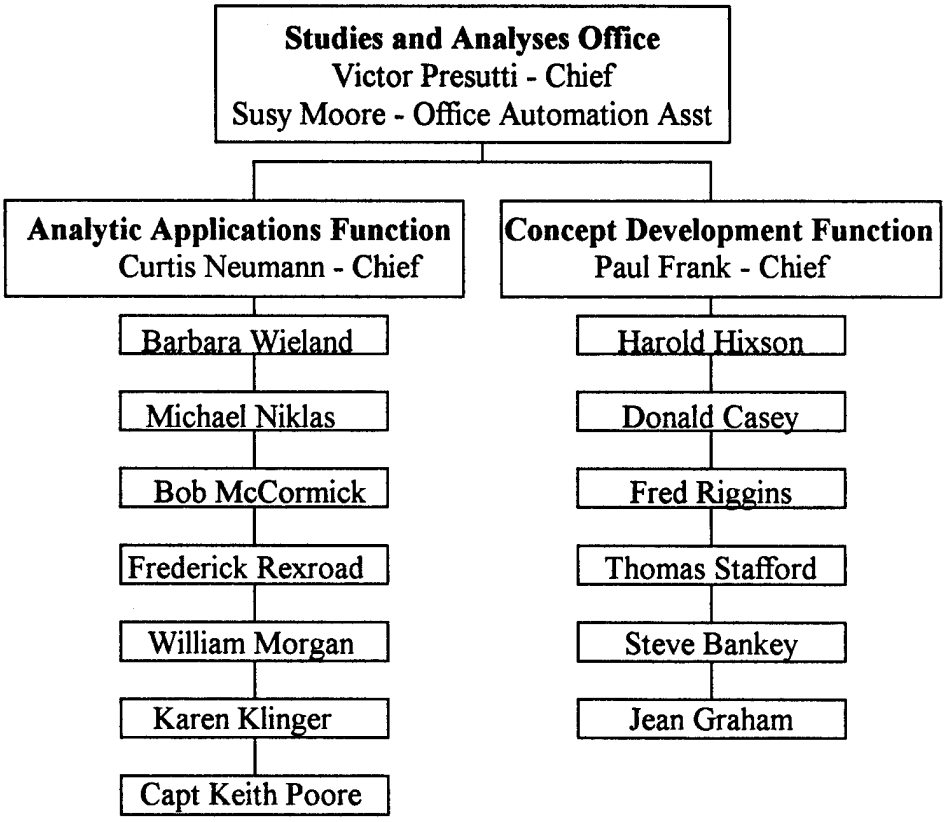
We actively assist the AFMC staff and other Air Force agencies in incorporating improved methodologies in their management of materiel resources. We are organized into two Functions. The Analytic Applications Function focuses on issues involving the requirements computation of peacetime and wartime recoverable item spares, the prioritization of repair and distribution actions needed to execute materiel support, and the assessment of weapon system capability due to the support actions taken. The Function's authorized staffing consists of eight operations research analysts and a logistics staff officer. The Concept Development Function focuses on new initiatives such as developing a prototype peacetime assessment capability for non-aircraft Command Control Communication Computer Intelligence (C4I) reparable items and identifying workload drivers for depot maintenance operations in the Air Logistics Centers. The Function's authorized staffing consists of eight operations research analysts. There is close cooperation and interaction between the analysts of the two functions on most studies.

This office has the Air Force technical responsibility for three recoverable item spares requirements models. The Aircraft Availability Model (AAM) is embedded in the Recoverable Item Requirements System (D041). It incorporates aircraft availability objectives into the computation process for peacetime operating stock. The Dyna-METRIC model is the wartime capability tool used by the Sustainability Assessment Module (SAM) of the Weapon System Management Information System (WSMIS). The

Aircraft Sustainability Model (ASM) is the computational technique employed by WSMIS/ REALM to identify wartime spares requirements. It is also used for determining initial spares requirements.

We also have the technical responsibility for the Distribution and Repair In Variable Environments (DRIVE) model. This model is used to prioritize the repair and distribution of recoverable items based upon the marginal gain in operational capability. Another model we use is JEMS (Jet Engine Management Simulator) to evaluate issues related to the management of aircraft engines.

The organization and current personnel of the Studies and Analyses Office are as follows:



The next two sections of this report contain specifics of our 1995 accomplishments and our planned program for 1996.

ACCOMPLISHMENTS IN 1995

In 1995 we focused on several major areas. We assisted AFMC in reallocating FY 95 and allocating FY 96 spares procurement funds by Air Logistics Center, weapon system, and item ("*Banding*"). This was a follow-on to our 1993 and 1994 development work to minimize the negative impact of limited funding for procurement of spare parts on the Air Force's front line weapon systems. We played a significant role with several aspects of an Air Force/AFMC initiative to improve procurement, repair, and distribution processes to simultaneously reduce resupply times and cut costs ("*Lean Logistics*"). A major accomplishment for Lean Logistics was our work that demonstrated the Readiness Based Leveling (RBL) method is the most effective method to allocate stockage levels among retail (base) and wholesale (depot) locations ("*Retail and Wholesale Stockage Levels*"). We continued our effort to help AFMC's Air Logistics Centers (ALCs) implement an approach which ensures that the items most in need of repair and/or distribution to support the operators' sortie generation capability will get priority attention ("*DRIVE*"). Extensions of this work were incorporated into the new single system in Lean Logistics for prioritizing depot exchangeable repair called Execution and Prioritization of Repair Support System ("*EXPRESS*"). We continued our work with an interface between DRIVE and the Stock Control System that automatically releases requisitions for shipment. We helped it become the standard process chosen by the Stock Control Reengineering Team for distribution under Lean Logistics ("*Automated DRIVE Distribution*"). We helped the Air Staff, System Program Directors, and others understand and improve the modeling process used in reporting weapon system status ("*Weapon System Modeling*"). We continued working with the Joint Logistics System Center (JLSC) to help define the appropriate multi-echelon spares requirements modeling strategies that will best satisfy the Components' needs ("*JLSC Support*"). We entered new ground and determined a new way to forecast total depot maintenance workload ("*DMBA Workload*"). We worked to determine how DRIVE could be used to handle the distribution of whole engines ("*Engine DRIVE*"). We analyzed the spare engine requirements computation for the T1A Jayhawk trainer and found that high levels of availability could be maintained with fewer spare engines than were originally computed ("*T1A Spare Engines*"). We developed an objective method of assigning Combat Logistics Support Squadron Aircraft Battle Damage Repair teams to weapon systems in the future ("*CLSS/ABDR*"). We made significant progress on developing an availability assessment tool to estimate peacetime supportability of Command, Control, Communication, Computer, and Intelligence systems ("*C4I Model*"). We completed a special effort supporting the Air Staff that demonstrated the benefits of removing very low demand items from Readiness Spares Packages ("*Reducing Authorizations*"). We helped the F-22 System Program Office determine which tools to use for determining requirements for initial spares ("*RBS Support*"). And finally, we developed a database reporting and management system that is being prototyped by AFMC social actions offices for possible implementation Air Force-wide ("*Social Actions Database*").

In addition to these major areas, the following descriptions of our 1995 accomplishments include numerous other analysis issues we worked.

TITLE: *Support to Lean Logistics and Reengineering Initiatives*

CUSTOMER: HQ AFMC/LG-LL, Reengineering Teams

OBJECTIVE: Lean Logistics and the AFMC reengineering teams are related efforts. Lean Logistics is an Air Force initiative to speed up the procurement, repair, and distribution of spare parts to provide better support to the end user at the lowest possible cost. We have been supporting this effort for years. We continued our support of Lean Logistics as well as the work of some of the AFMC reengineering teams when their efforts began merging with Lean Logistics efforts last year.

RESULTS: We supported these initiatives in a number of ways. A major issue was deciding how to better establish base and depot stock levels. We were a main player in the analysis of alternative methods of setting levels and are now a key developer in the implementation of Readiness Based Leveling (RBL). (See *Retail and Wholesale Stockage Levels for the Air Force*). When the Stock Control and Distribution Reengineering team selected the Distribution and Repair in Variable Environments (DRIVE) Distribution Module (DDM) as the preferred way to distribute Air Force spare parts, they asked for our help to resolve several design and implementation issues. (See *Automating DRIVE Distribution*). For determining which items to put into repair, several approaches were being considered for use by the initial Lean Logistics test shops. We helped develop the basic architecture for a system that would satisfy the required functions. This system is known as the Execution and Prioritization of Repair Support System (EXPRESS). (See *Designing the Architecture for EXPRESS*). We were also asked by the Requirements Reengineering team to help analyze the feasibility and usefulness of their proposed concept of a Working Fund Account (WFA) which would drastically change the way the Air Logistics Centers (ALCs) get Obligation Authority for both buy and repair. (See *Working Fund Account (WFA)*). Most of our work on these related efforts has been incorporated into Pacer LEAN which will test the new management initiatives presented by the AFMC Commander in his Senior Leader Materiel Course (SLMC). A specific effort in support of SLMC was our development of a new Quality Performance Indicator that measures base maintenance wait time to reflect how effectively AFMC is providing parts support to our operational customers.

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TITLE: *Retail and Wholesale Stockage Levels for the Air Force*

CUSTOMER: HQ AFMC/LG-LL/LGI

OBJECTIVE: The Air Force is implementing concepts which move towards retail and wholesale integration. One function supporting this is the establishment of stockage levels, which control the allocation of assets. Our objectives were to investigate how best to accomplish this function and to support initial applications.

RESULTS: We accomplished two key related efforts. We first analyzed alternative methods for determining base and depot stockage levels. We found that the Readiness Based Leveling (RBL) method could be used to set both base levels and the depot working level. (The depot working level is terminology used in Lean Logistics defined as the depot repair pipeline quantity plus depot serviceable stock or depot safety level.) RBL also performed best in terms of minimizing expected worldwide backorders at the operating bases. Minimizing base backorders for setting stockage levels is consistent with the goal of maximizing aircraft availability in our requirements computation. Based on our efforts and a complementary effort by the Air Force Logistics Management Agency (AFLMA), the Air Force Stockage Effectiveness Board (AFSEB) decided to implement RBL for computing both base stockage levels and depot working levels.

Since RBL is not yet implemented as a system, we were asked to compute base and depot stockage levels for items repaired by selected Lean Logistics shops. We were nearing completion of this effort for the initial shops at year's end. Those levels are to be implemented in early 1996. Since non-Air Force demands are not included in the basic RBL approach, we also completed the development of a method for including non-Air Force demands in the depot working level.

ANALYSTS: Bob McCormick, Curtis Neumann
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TITLE: *DRIVE Implementation Support*

CUSTOMER: HQ AFMC/LGI, ALCs, MAJCOMs

OBJECTIVE: Support the implementation of the AFMC Distribution and Repair in Variable Environments (DRIVE) production system. Both mainframe and DeskTop DRIVE are included in the production system. The mainframe portion of the system performs repair planning functions for the command by looking at the future repair needs across ALCs, weapon systems, and users. It consolidates numerous data gathering functions from many sources and then distributes the appropriate data to the applicable ALCs where DeskTop DRIVE is then used by each Center to prioritize repair and distribution actions for the specific items under its control. DRIVE is being implemented in the Execution and Prioritization of Repair Support System (EXPRESS) for repair prioritization. It is also being implemented as part of the reengineered Stock Control Process for distribution prioritization. The goal is to closely link recoverable item depot repair and distribution actions to operational customers' needs. We are the Air Force technical OPR for the DRIVE model and technical consultant to both the DRIVE Functional Office (being renamed EXPRESS Functional Office in 1996) and Program Management Office.

RESULTS: We developed, tested, and helped implement two significant modifications to the DRIVE model. One incorporated a model change which allows DRIVE to include items with non-flying hour failure patterns. The other, to be implemented in early 1996, incorporates model changes to include non-aircraft items in DRIVE. Together these changes will add all remaining recoverable items to the DRIVE database.

We worked on a number of implementation and enhancement issues with the AFMC Re-engineering Teams, ALC and MAJCOM users, and development contractors. We played a key role in a design effort with the Stock Control Reengineering Team to integrate automated DRIVE distribution capability with the Stock Control Systems (see *Automating DRIVE Distribution*). We also had a key role in the Requirements and Workload Broker Reengineering Teams' design of the EXPRESS repair system. DRIVE is a major component of EXPRESS (discussed further in the *Designing the Architecture for EXPRESS*).

ANALYSTS: Bob McCormick, Barbara Wieland
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TITLE: *Automating DRIVE Distribution*

CUSTOMER: HQ AFMC/LGI, Stock Control and Distribution Reengineering Team

OBJECTIVE: Develop and implement a system to automatically release and ship items from the depot according to Distribution and Repair in Variable Environments (DRIVE) priorities to reduce user workload, increase acceptance of DRIVE priorities and, ultimately, as shown through numerous studies and field exercises, improve weapon system availability.

RESULTS: OSD previously granted the Air Force a waiver to use DRIVE distribution priorities in lieu of the Uniform Material Movement and Issue Priority System (UMMIPS). To implement this waiver, changes were needed to the Stock Control System's Item Management Wholesale Requisition Process System (D035A) to use DRIVE priorities rather than UMMIPS priorities to release requisitions. However, the Joint Logistics Systems Center (JLSC) had accepted D035A as the standard system for processing requisitions and was not allowing any changes at that time. Therefore, it was decided to automate DRIVE distribution at each ALC with a system made up of DeskTop DRIVE married to an Item Manager (IM) emulator developed by OO-ALC. This combination is called the DRIVE Distribution Module (DDM) and is run daily. Basically, DDM matches DRIVE distribution recommendations to the actual requisitions in D035. It uses the IM emulator to fill them either by shipments of serviceables from the depot warehouse or by prepositioning the requisitions so that they are filled as serviceables become available from either organic or contractor repair. During 1995, we continued to support the phased implementation of DDM at OC-ALC (B-1B items and the oxygen shop items), OO-ALC (landing gear items, some engine items, and F-16 avionics items), SA-ALC (T56 and engine electrical parts), and WR-ALC (LANTIRN and ALQ-135 band 3 items). We provided a great deal of systems analysis support to guide the software developers in a number of areas, such as, the treatment of substitute parts, MICAPs, and Foreign Military Sales (FMS) requisitions and the automation of squadron-specific application percentages. After the Stock Control and Reengineering team decided that they very much wanted to support the use of DDM to distribute AFMC exchangeable parts, it was decided to revisit the issue of incorporating the method into D035A. We played a major role in developing a Computer Systems Requirements Document (CSRD) to move the code that does the matching of the DDM prioritization list to the actual requisitions into the D035A. Moving this code to D035A will improve the performance of the whole DDM process significantly.

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TITLE: *Designing the Architecture for EXPRESS*

CUSTOMER: HQ AFMC/LG-LL/LGI

OBJECTIVE: Design the basic architecture to satisfy the requirement for one Command process for determining which items to put into repair by integrating the best features of several competing approaches. The candidate approaches were those used in the initial repair shops selected to demonstrate Lean Logistics concepts. One approach used by OC-ALC was the Automated Induction System (AIS). Its objective was to greatly simplify the induction process by automatically triggering a repair induction if an item's current status was below its predetermined working level goal and a carcass was available. Another approach used by OO-ALC included both DeskTop DRIVE and the Supportability Module. DeskTop DRIVE automated repair prioritization by considering the need across all users for items requiring the same repair resource. Supportability provided an automated interface with depot management systems to examine whether or not the items needing repair were supportable for repair parts and other resources so management attention could be focused on resolving deficiencies.

RESULTS: We developed an initial concept for an approach that included some AIS functions, DRIVE prioritization capability, and Supportability constraint identification. We participated in a command-wide meeting that built upon this initial concept to determine the functions and components for one integrated approach to meet Lean Logistics requirements. The resulting approach was named Execution and Prioritization of Repair Support System (EXPRESS). It also added a feedback loop to identify repair process bottlenecks to process managers. As part of this effort, we completed development of a prioritization approach for non-aircraft items which is compatible with the DRIVE approach. This will enable EXPRESS to be used for all items -- both aircraft and non-aircraft items.

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TITLE: *Weapon System Modeling and Reporting Assistance and Technical Support*

CUSTOMER: HQ USAF/LGS, HQ AFMC/DR, C-5 SPO

OBJECTIVE: Develop and maintain expertise within AFMC on the models and presentation tools which are employed in either a Weapon System Program Assessment Review (WSPAR) or Sustainment Executive Management Report (SEMR). WSPAR and SEMR are high-level briefings on the health of a weapon system. Current capability is shown relative to the planned operational requirement. Problems with weapon system support are discussed, along with proposed solutions, and forecasts of future peace and wartime capability. The Windows Logistics Assessment Model (WINLAM) is a software tool which provides indicators of weapon system health for both WSPAR and SEMR.

RESULTS: In preparation for the last C-5 WSPAR, the System Program Director (SPD) asked us to evaluate the SEMR indicators and make recommendations. We worked with a team which made significant improvements to the SEMR indicators. We also conducted an in-depth sensitivity analysis to demonstrate how various funding and pipeline factors affect future weapon system availability indicators addressed by the SEMR. In another effort, we prepared a paper which demonstrates WINLAM's sensitivity of weapon system availability to various changes in logistics support. Further, the paper explains an otherwise misleading wartime capability assessment factor (Max UTE) and offers suggestions for improvement. Then, in late 1995, when the SEMR OPR was looking for an indicator of depot support to warfighting squadrons, we were successful in convincing them to incorporate our Depot Sustainment Indicator (a capability assessment which integrates DRIVE and Dyna-METRIC).

ANALYSTS: Michael Niklas, Thomas Stafford
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TITLE: *RSD Banding for Effectiveness*

CUSTOMER: HQ AFMC/LG/FM/DR

OBJECTIVE: Assist AFMC in allocating its updated 1995 and new 1996 Obligation Authority (OA) for recoverable item spares replenishment buys by ALC and weapon system. In addition, provide guidance by item, as needed, to the Reparable Stock Division (RSD) item managers.

RESULTS: We are continuing to refine the RSD Banding process for distributing OA by modifying and then applying the methodology first developed for the FY 94 OA distribution. For FY 95 we updated our distribution as Air Staff updated our OA dollar amounts. These updated distributions were incorporated in the Annual Operating Budgets (AOB) which were periodically given to the ALCs. For FY 96 we refined the methodology to account for effects of Lean Logistics which were not yet captured in the D041 data. However, the banding process was not necessary since RSD procurement was fully funded. AFMC was given the authority to flex OA between stock fund accounts so the banding procedure was used to help determine how much RSD procurement OA could be shifted without seriously affecting support. This project will be ongoing until the production requirements system is upgraded to handle severe funding shortfalls.

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TITLE: *Forecasting Depot Maintenance Business Area Organic Workload*

CUSTOMER: HQ AFMC/LGP

OBJECTIVE: Develop a systematic process to aid HQ AFMC/LGP in improving the forecasting of Depot Maintenance Business Area (DMBA) workload

RESULTS: Our analysis focused on the total organic workload that had been produced at the five Air Logistics Centers for the FY 1984-1994 time period. We developed a tool to forecast total organic DMBA workload using historical flying hours, fleet inventory, and actual work performed. We then made forecasts using the President's budget future flying hours and aircraft inventory and found that the tool provides an easy and fast way to forecast total DMBA workload with accuracy that is better than existing methods. We also found that we could not forecast commodities and individual Air Logistics Center's workload with the same accuracy as we could forecast the total workload.

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TITLE: *Combat Logistics Support Squadron (CLSS) Aircraft Battle Damage Repair (ABDR) Teams*

CUSTOMER: HQ AFMC/LGM

OBJECTIVE: Develop an approach to help assign CLSS ABDR teams which support war-tasked weapon systems. The approach should include weapon systems' utilization, vulnerability, complexity and wartime factors to determine the number of teams for a weapon system.

RESULTS: We analyzed the weapon systems' planned wartime Primary Authorized Aircraft (PAA) levels, utilization rates, complexities, and vulnerabilities to determine if there were any relationships to the existing number of teams assigned to each of the weapon systems. Using regression analyses we found a very good relationship between the existing number of teams and an interaction variable of wartime PAA and weapon system vulnerability. Our findings supported tentative plans to reassign a few of the teams. The resulting regression equation can be used by LGM as a management tool to support decisions in manpower allocations.

ANALYSTS: Thomas Stafford, Barbara Wieland
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TITLE: *Peacetime Assessment Model for Non-Aircraft Command, Control, Communications, Computer, and Intelligence (C4I) Items*

CUSTOMER: HQ AFMC/DRD

OBJECTIVE: To develop a prototype peacetime assessment model for non-aircraft C4I systems considering reparable items based on item specific requirements and funding.

RESULTS: A list of non-aircraft C4I weapon systems was developed by HQ AFMC/DR and supplied to us. We agreed to use the Ground Theater Air Control System (GTACS) as a test system to develop a model to assess peacetime requirements for reparable spares. Our approach was to modify the Aircraft Availability Model so that it can be used to assess equipment-type applications. A major hurdle was a lack of data showing the indenture structure of the recoverable items on non-aircraft applications. We overcame this by developing software to build levels of indenture files for the GTACS equipment from the Application, Program, and Indenture (API) files. We expect to deliver the prototype to HQ AFMC/DR in May 1996. The assessment tool will provide the capability for C4I System Program Directors (SPDs) to generate a requirement, modify goals, evaluate asset positions, and make some estimates of system availability due to supply.

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TITLE: *Analysis of AETC Two-Level Maintenance (2LM) Support*

CUSTOMER: HQ AFMC/LGI, HQ AETC/LGS, AFLMA/LGS

OBJECTIVE: Investigate concerns by HQ AETC that DRIVE supports F-16 2LM war-tasked units -- those with Readiness Spares Packages (RSPs) -- at the expense of AETC's non-war tasked units.

RESULTS: We conducted an analysis investigating AETC's concerns and an AETC suggestion that non-war tasked unit support could be increased by making DRIVE 'think' that those units have additional flying hours. We found that DRIVE provides comparable aircraft availability rates for both war tasked and non-war tasked units. The non-war tasked units in our analysis did appear to have a greater cannibalization rate.

We then measured the impact of AETC's suggestion on expected aircraft availability and cannibalization rates. We found that their suggestion increases aircraft availability and lowers the expected cannibalization rate to be comparable to rates for war-tasked units. For the range of F-16 2LM items, the increased support to AETC's bases only slightly affects a war-tasked base's aircraft availability and cannibalization rates. Based partially on this work, the Air Force Stockage Effectiveness Board (AFSEB) decided to test the AETC suggestion for a six month period and tasked the AFLMA to analyze the results of the test. We provided DRIVE consulting support to them. Their work is expected to be completed in early 1996.

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TITLE: *Reducing Authorizations of Low-Demand Items*

CUSTOMER: HQ USAF/LGSS

OBJECTIVE: The Air Staff asked us to help with an initiative to reduce the number of items in Readiness Spares Packages (RSPs). They asked us to focus on parts with very low demand rates or "just in case" parts. We don't expect many to break, but deploying squadrons are authorized to take a few just in case they need them.

RESULTS: We analyzed the range, depth, cost, weight, cube, and demand history of RSP items to identify those which could possibly be regionalized. We provided our results to the Air Staff to use to examine the possibility of regionalizing assets to just a few locations worldwide. This could result in significant reductions in deployment quantities while still making parts available if actually needed.

ANALYSTS: Michael Niklas, William Morgan
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TITLE: *Integrating an Assessment Capability into DRIVE*

CUSTOMER: HQ AFMC/LGI

OBJECTIVE: Integrate a peacetime/wartime assessment capability into the Distribution and Repair In Variable Environments (DRIVE) model used to determine the priority of depot repair and distribution actions. DRIVE's objective function is to maximize the probability of achieving stated peacetime and wartime availability goals while other models used by the Air Force relate the expected aircraft availability achieved to the dollars expended or to the specific spares available. These other models include the Aircraft Availability Model used for peacetime spares requirements computation and capability assessment, the Aircraft Sustainability Model for wartime spares requirements computation, and the Dyna-METRIC model used for wartime capability assessment in the Weapon System Management Information System (WSMIS) and for peacetime capability assessment in special studies. By integrating an assessment capability into DRIVE, we can estimate the aircraft availability that results from DRIVE's actions. This statement of availability should be more useful to managers than a statement of the probability of achieving availability goals.

RESULTS: We determined we could provide a peacetime and wartime capability assessment of DRIVE's actions by using the Dyna-METRIC model to assess data from DRIVE. We developed interface software to read DRIVE input files and convert them to Dyna-METRIC formats to allow us to use Dyna-METRIC for the assessment. By using DRIVE input files as the input to Dyna-METRIC we are assured that both systems are using the same data. The conversion program is currently in initial testing and should be available for use by June 1996. At that time we will make it available for users of DeskTop DRIVE for user testing.

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TITLE: *Social Actions Database System*

CUSTOMER: HQ AFMC/DPPP

OBJECTIVE: The AFMC social actions office is responsible for reporting military equal opportunity/human relations incidents to the AFMC Commander monthly and to HQ AFMPC semi-annually. In the past, all data collection and report development was done manually and took several weeks to accomplish (approximately 420 man-days for AFMC alone in the completion of the two semi-annual reports). We were asked to help by building a prototype automated reporting system to improve the timeliness and accuracy of social actions reporting.

RESULTS: In 1995, we developed and delivered a prototype database system which the AFMC social actions office is currently testing and evaluating. They estimate our system will result in a savings of approximately 360 man-days for AFMC reporting. AFMPC is very interested in our prototype and plans to use it as the basis for a system they will develop by October 1996 for the entire Air Force social actions community.

ANALYST: Karen Klinger
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TITLE: *T-1A Jayhawk Spare Engine Requirements Review*

CUSTOMER: Air Force Audit Agency

OBJECTIVE: The Air Force Audit Agency asked us to evaluate several different computation options for the T-1A engine.

RESULTS: We developed a report that relates the engine requirement to aircraft availability. The report also explains the relationship between aircraft availability and the primary measure of engine availability (ready rate, or "confidence factor"). This work showed a much lower spares authorization level (28) was needed than had originally been recommended (40). The report demonstrates that several million dollars worth of spare engines can be saved while maintaining high aircraft availability. A spreadsheet program was developed to facilitate the calculation and comparison of various performance measures for a multi-echelon maintenance/supply system.

ANALYSTS: Michael Niklas
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TITLE: Readiness Based Sparing *(RBS) for Initial Support and FMS*

CUSTOMER: HQ AFMC/LGII, ASC/AL, AFSAC/GBKC, SA-ALC/LFTE

OBJECTIVE: Develop and assist with implementation of a readiness based sparing (RBS) system for new USAF weapon systems, Foreign Military Sales (FMS), and other applications.

RESULTS: The Air Force applies readiness based sparing (RBS) when calculating recoverable item spares requirements for peace and war, but in the past, RBS has not been applied to new systems or FMS. In support of several distinct sponsors, we developed a spares management system consisting of a Foxpro database linked to the RBS model the Air Force uses to compute war spares. This system has been delivered to the F-22 System Program Office, a FMS office in San Antonio for use with the International Weapon Item Projection System (IWIPS), and the requirements reengineering team that is revising the Air Force provisioning process. It will soon be provided to Argentina to calculate a cost-effective spares mix to help them improve their C-130 support.

ANALYSTS: Karen Klinger, Michael Niklas
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TITLE: *DRIVE Engine Investigation*

CUSTOMER: AFMC SAO

OBJECTIVE: Determine whether whole engine management is compatible with module and exchangeable engine part management. Investigate the possibility of using Distribution and Repair in Variable Environments (DRIVE) to improve the repair prioritization and distribution of whole engines. Document the data elements needed for incorporation of whole engines into the DRIVE model. Thoroughly explore all aspects of the alternative approaches for such engine incorporation. Document the benefits obtainable by extending DRIVE's scope to include whole engines.

RESULTS: We investigated whether whole engine management is compatible with the way in which DRIVE handles engine parts. We monitored the progress of a prototype DRIVE operation which was underway at SA-ALC for T56 engine (C-130 aircraft) modules and exchangeable items. We will continue our work in 1996 to analyze data and investigate alternatives for including whole engines in DRIVE.

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TITLE: *Joint Logistics Systems Center (JLSC) Requirements Analysis Support*

CUSTOMER: JLSC/MM

OBJECTIVE: To provide modeling support to the JLSC. We are providing the official Air Force expertise to the JLSC on math models used to compute spare parts requirements. We are a member of the JLSC 'math models group' tasked in a joint DoD effort to devise common requirements models to be used by all the DoD components.

RESULTS: We are being funded by the JLSC to look specifically into the area of multi-echelon, readiness based sparing (RBS) techniques. We are part of a component team focusing on Initial Requirements Determination (IRD) by working with the JLSC and their contractors in the development of an IRD/RBS workstation. This workstation contains the candidate suite of RBS models made available from the services from which we are working to determine which method best provides the desired functionality for meeting Air Force requirements for a readiness based IRD system. We compared the Navy's aviation model with an Air Force model for computing initial requirements and found that while the Navy's approach appears to be adequate for the retail portion of IRD, it does not compute wholesale requirements. The Air Force model, the Aircraft Sustainability Model (ASM) does meets the functional Air Force requirements by computing the wholesale and retail together. Other areas where we are focusing our efforts include testing a 'standardized' wholesale Economic Order Quantity (EOQ) model. This testing will include the analysis of the proper parameter settings (e.g., ordering cost, maximum acceptable probability of stockout) required by the Air Force for a consumable item requirements computation. We continue to provide support to Air Force representatives on the JLSC Requirements Computation System (RCS) component review team and evaluate packages from the developer that pertain to math models issues.

ANALYST: William Morgan
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TITLE: *Support for the Development and Implementation of WSMIS*

CUSTOMER: HQ AFMC/LGI, MSG/SXM, MAJCOMs, HQ USAF/LGSS

OBJECTIVE: Improve the quality and usefulness of the Weapon System Management Information System (WSMIS) by designing enhancements and solving technical problems. Take an active role in providing technical assistance to the WSMIS functional management office, the WSMIS Program Office, the development contractors and users of the system.

RESULTS: Our efforts this year were directed primarily at data and modeling issues:

a) At the request of HQ AFMC/LGI, we developed software to produce Readiness Spares Package (RSP) statistical summaries, which will give the customer an overview of the constitution of RSPs and help track changes over time.

b) We worked with the Logistics Management Institute (a WSMIS contractor) to devise a regression formula which can improve the accuracy of sortie projections that are produced by the WSMIS Sustainability Assessment Module (SAM). The regression formula was developed based on data from a monte carlo simulation model and WSMIS SAM. The correlation was found to be very high (98% r-square).

c) As members of a WSMIS quality control team, we advised HQ AFMC/LGI on the proper usage of model parameters for capability assessments, identified anomalies in the data feed to the Air Force critical item program and WSMIS REALM, and reviewed WSMIS processing functions in support of standardization, streamlining, and modernization.

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TITLE: *B-1 Banding Evaluation for Funding and Aircraft Availability*

CUSTOMER: HQ AFMC/LGI

OBJECTIVE: Because of Air Staff and MAJCOM concerns about the support posture for the B-1, HQ AFMC/LGI asked for help to evaluate the B-1's aircraft availability with different funding levels.

RESULTS: We used the Aircraft Availability Model and the database resulting from our work on FY 94 RSD Banding for Availability and analyzed the effects of varying the goals of the B-1. We also incorporated new and updated repair factors that were observed in the B-1 Operational Readiness Assessment. Our results were used by the Air Staff and HQ AFMC/LG to decide on how much obligation authority was required to "beef up" the B-1.

ANALYSTS: Capt Robert Block, Frederick Rexroad
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TITLE: *Working Fund Account (WFA)*

CUSTOMER: Requirements Reengineering Team

OBJECTIVE: Help the Requirements Reengineering Team develop a test of their proposed Working Fund Account concept.

RESULTS: We met with the team to better understand their proposed Working Fund Account concept which would change how the ALCs get Obligation Authority (OA). For example, repair OA is currently allocated among the ALCs by HQ AFMC based primarily on the repair budgets developed by the ALCs and then allocated by each ALC to various organizations within the Center. Under the WFA concept, each ALC would earn OA whenever a requisition is filled for an item that the ALC manages and thus eliminate much of the planning, budgeting and reallocation effort currently required at the ALCs. The WFA would be a true revolving fund with no year money. The team believes a WFA concept would support repair on demand, would better allocate the OA between the ALCs, and would dramatically reduce the time spent developing ALC budgets. In our assessment of the issues, we determined that the motivation for the WFA appeared to be the difficulties associated with the current methods of allocating repair funds to and within ALCs. We suggested to the team that an alternative to the WFA would be to eliminate the ALC repair budgeting, develop the command repair budget at the Headquarters, allocate funds only to ALC level, and pay for repairs from the Center allocation as they are accomplished. Repair decisions would no longer be controlled by funding but done in accordance with a system such as the Execution and Prioritization of Repair Support System (EXPRESS) that does a much better job than the current repair determination process of making sure the right things are repaired. The team considered our recommendation but felt they had a charter to continue with the WFA concept. At the end of 1995, we acquired several months of data on filled requisitions from all of the ALCs and began an analysis to compare the amount of OA each ALC would have received under a WFA concept to how much they actually received. We hope to gain insight that would indicate whether to proceed with a test of the idea. In an independent development, the AFMC Commander decided an approach almost identical to our proposal should be used for the Pacer LEAN tests of the initiatives he developed for his Senior Leader Materiel Course (SLMC). We expect to complete our work on this project in 1996.

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TITLE: *Improving the Surcharge Methodology*

CUSTOMER: HQ AFMC/FM

OBJECTIVE: Develop an "equal revenue line" (revenue neutral) methodology for collecting the necessary surcharge for the air logistic centers to operate; i.e. modify the current surcharge.

RESULTS: Working closely with HQ AFMC/FM, we analyzed the current surcharge policy and looked at how the individual assets were affected. We developed a methodology that separated repair and procurement information. To examine the impact, we looked at a carcass ratio, percent sales without a carcass, and percent sales with a carcass. From this ratio, we are able to use our D041 data to "select" a surcharge factor that is revenue neutral. We then applied the surcharge factor to the last repair price, the future acquisition cost, and numerous other data inputs to arrive at a surcharge factor for an item. HQ AFMC/FM asked that we use current D041 data to calculate the amount of revenue generated by the new proposed method to demonstrate that the necessary amount of revenue would be collected. They used these results to present their proposal to the Air Staff in recommending changes to the current system and for clarification as to how the Air Force collects its surcharge in comparison to the other services and the Defense Logistics Agency.

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TITLE: *Forecasting Not Reparable This Station (NRTS) and Demand Rates*

CUSTOMER: AFMC SAO, OO-ALC/FMDR

OBJECTIVE: Determine an appropriate forecasting technique(s) for improving demand and Not Reparable This Station (NRTS) rates by comparing several different techniques and measuring errors. This was generated by questions from analysts at OO-ALC who observed unusual behavior in some of the demand and NRTS forecasts in the data they were loading into DeskTop DRIVE to prioritize repair and distribution actions for their two level maintenance items.

RESULTS: We tested several techniques including eight-quarter moving average, linear regression analysis, and double exponential smoothing, and determined that none of the techniques relying solely on flying hours offered much improvement. We will now focus on sorties as drivers of failures to see if we can improve the forecasting technique used.

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TITLE: *Repair Funding Allocation*

CUSTOMER: HQ AFMC/LGI

OBJECTIVE: Determine a way to allocate repair funding to ALCs (by weapon system) for all Air Force recoverable items repaired by both organic and contract sources. This effort was initiated by concerns that repair funding may be cut and that a 'banding' approach similar in concept to the process used for spares buy may be necessary for repair (See *RSD Banding for Effectiveness*).

RESULTS: We determined that there were two feasible methods that could be used to do this funding allocation. One was to use the D041 database and the Aircraft Availability Model (AAM) to allocate the Obligation Authority (OA) in a repair version of the approach used to allocate procurement OA for RSD Buy Banding. The other approach was to use the DRIVE database and model to allocate the OA. Each method has its pro's and con's. Since DRIVE was developed specifically to address repair and is the tool endorsed by LGI to execute repair dollars, LGI preferred that we use the DRIVE approach if possible. However, the DRIVE system needed some further additions and modifications before it could be used to allocate repair OA. We determined that if repair funding allocation was needed, we could use the AAM approach to accomplish the objective within the time required. Fortunately, repair was funded at a high enough level in 1995 that this was not necessary. We are continuing to support the effort to change the DRIVE system so that it has the capability to allocate limited repair OA across AFMC. In addition, we plan to look into one other alternative which uses a version of the Aircraft Availability Model that actually trades off the benefit of dollars spent on buying more spares of some items versus repairing other items. We expect to make substantial progress on this issue in 1996.

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TITLE: *Analysis of Conformance Verification Program (CVP) Data*

CUSTOMER: HQ AFMC/ENM

OBJECTIVE: HQ AFMC/EN developed the CVP several years ago to determine the quality of spare parts entering the Air Force inventory. Testing was done by each Air Logistics Center on a random sampling as well as on a pre-selected item basis. The tasking to SAO was to provide statistical analysis, including confidence levels and tests of hypothesis, of the AFMC-wide data.

RESULTS: We performed two analyses. Our initial analysis was conducted during the last quarter of CY 93 and documented in SAO Technical Report #93-293, February 1994. A follow-on analysis was conducted on FY 94 data and documented in a SAO Technical Report in January 1995. In general the quality of parts has improved both with regard to contract conformance and the serviceability of the parts.

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TITLE: *AFMC Depot Manpower Programming*

CUSTOMER: HQ AFMC/XPM

OBJECTIVE: Define AFMC depot manning requirements (organic and contractor) by weapon system. The method developed should relate changes in manning to Program Element Codes and weapon system activity (inventory, flying hours, complexity, organic/contractor mix, etc.).

RESULTS: AFMC currently does not have a system which tracks all manpower spaces to a specific weapon system. Since no database was available relating how manning is allocated to a specific weapon system, we were not able to develop an algorithm that relates changes in manning to Program Element Code and weapon system activity. We did survey several organizations/data systems and were able to build a composite database which tracked over half of the manpower spaces at the Air Logistics Centers and Product Centers to weapon systems. We completed action on this project and turned all findings over to XPM.

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TITLE: *Statistical Consulting Support*

CUSTOMER: AFMC Headquarters Staff

OBJECTIVE: Provide a resource for use by all Headquarters organizations for consultation on statistical analysis. These "projects" range from short term (1-2 hours) to projects of several days and/or 1-2 hours (days) periodically over a several month period.

RESULTS: Examples of efforts this year are:

a. Assisted HQ AFMC/EN in establishing the sample size and method of taking a random sample to produce the confidence level and precision desired.

b. Assisted HQ AFMC/DRC in establishing the sample size and method of taking a random sample to produce the confidence level and precision desired to use in evaluating the new C001 data system that will replace C008 and K005C.

c. Assisted HQ AFMC/LGI in determining a sampling procedure to use in determining the accuracy of their Buy and Repair budgets.

d. Assisted HQ AFMC/PKM in evaluating their Contractor Performance Assessment System.

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TITLE: *Impact of Lean Logistics Resupply Times*

CUSTOMER: HQ AFMC/LGI

OBJECTIVE: Estimate the impact on C-5 and E-3 spares procurement costs of using resupply time reductions resulting from Lean Logistics initiatives.

RESULTS: HQ AFMC/LGI needed an estimate of the savings in spares costs that could result from using resupply time reductions from Lean Logistics initiatives. They asked us to evaluate the impact on the C-5 and E-3. We computed the effect of capping the depot pipelines at 53 days (10 days - order and ship time, 40 days - depot repair time, 3 days - base repair time) in the D041 database. The results were provided to HQ AFMC/LGI for initial estimates of the projected dollar savings from Lean Logistics resupply time reductions.

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THE PROGRAM FOR 1996

A major part of our effort for 1996 will be in support of new initiatives for Lean Logistics that help implement the AFMC Commander's initiatives in the Pacer LEAN shop demonstrations. While we have completed the work demonstrating the benefits of using Readiness Based Leveling (RBL) to set base and depot stockage levels, we anticipate a continued requirement to help the functional office implement RBL. This will include substantial work to verify, validate, or correct data quality needed for setting correct stockage levels. We will continue to play a significant role in integrating DRIVE into EXPRESS for prioritizing repair in the Pacer LEAN shops. We anticipate continued support and refinement during implementation of DeskTop DRIVE for Automated DRIVE Distribution used to distribute assets repaired in the Pacer LEAN shops. With our work nearly complete on the program to interface DRIVE with Dyna-METRIC, we expect to work to validate and implement the technique to help users better understand the impact of DRIVE's asset allocation on their expected mission capability rates. We plan to complete our work in 1996 that started in support of the Requirements Reengineering team to evaluate their proposed Working Fund Account for accumulating Obligation Authority (OA). We plan a continued refinement of the allocation of spares procurement funding (Obligation Authority) to the Air Logistics Centers by weapon system and by item. However, in 1996, we anticipate a greater emphasis on the need to allocate repair funding obligation by ALC and weapon system. We plan a major effort to evaluate alternative approaches to accomplishing this. We will continue our involvement with the SPDs and help them ease their workload as well as improve their accuracy in reporting weapon system status information. We will complete development of a prototype model for peacetime assessments for non-aircraft C4I reparable items based on item specific requirements and funding. We will complete our analysis of how to incorporate whole engines into DRIVE. Our direct analysis support to the JLSC will continue in 1996 with completion of our analysis of the best approach for Air Force initial requirements determination and membership on a JLSC team to review the functional requirements of the components to see which models developed may apply. We expect requests for support from AFSAC to help foreign military customers acquire models that they can use to determine what mix of spare parts to buy for the dollars they have to spend and to estimate the resulting capability. We will continue with our efforts to improve a total DMBA workload forecasting tool that was developed last year. We expect 1996 to be a very busy year.

ACRONYMS

2LM	Two Level Maintenance
AA	Aircraft Availability
AAM	Aircraft Availability Model
AAPM	Aircraft Availability Procurement Model
ABDR	Aircraft Battle Damage Repair
ACC	Air Combat Command
ACIM	Availability Centered Inventory Model
ACSC	Air Command Staff College
AETC	Air Education and Training Command
AFAA	Air Force Audit Agency
AFIT	Air Force Institute of Technology
AFLMA	Air Force Logistics Management Agency
AFMC	Air Force Materiel Command
AFSAC	Air Force Security Assistance Center
AFSEB	Air Force Stockage Effectiveness Board
AFWC	Air Force Wargaming Center
AIM	Alternatives to Intermediate Maintenance
AIS	Automated Induction System
ALAM	Airlift Logistics Assessment Model
ALC	Air Logistics Center
ALT	Administrative Leadtime
AMC	Air Mobility Command
AOB	Annual Operating Budget
API	Applications, Programs, and Indentures
APU	Auxiliary Power Unit
ARROWS	Aviation Retail Reqmts Oriented to Weapon Replaceable Assemblies
ASM	Aircraft Sustainability Model
AWM	Awaiting Maintenance
AWP	Awaiting Parts
BCR	Baseline Change Request
BCS	Bench Check Serviceable
BLSS	Base Level Self-Sufficiency Spares (now IRSP)
C4I	Command, Control, Communication, Computer, and Intelligence
C-Ratings	Combat Ratings
CAIG	Cost Analysis Improvement Group
CAMS	Core Automated Maintenance System
CEMS	Comprehensive Engine Management System
CENTCOM	Central Command
CIM	Corporate Information Management
CLRU	Consumable Line Replaceable Unit
CLS	Central Leveling Summary
CLS	Contractor Logistics Support
CLSS	Combat Logistics Support Squadron

COBRA	Cost of Base Realignment Actions
CONUS	Continental United States
COTS	Commercial-Off-The-Shelf
CPU	Central Processing Unit
CRI	Consolidated Reparable Inventory
CSE	Common Support Equipment
CSF	Critical Success Factor
CSI	Consolidated Serviceable Inventory
CSIS	Central Secondary Item Stratification
CSMS	Combat Supplies Management System
CSRD	Comm-Computer Systems Requirement Document
CVP	Conformance Verification Program
D028	Central Leveling System
D035	Stock Control System
D035A	Item Manager Wholesale Requisition Process
D035C	Recoverable Assembly Management Process
D035K	Wholesale and Retail Receiving and Shipping Process
D041	Recoverable Item Requirements System
D042	Comprehensive Engine Management System
D087C	Sustainability Assessment Module
D087J/K	AFMC DRIVE Production System
D104	Worldwide Stock Balance & Consumption System
DDM	DRIVE Distribution Module
DDR	Daily Demand Rate
DFIO	DRIVE Functional Integration Office
DLA	Defense Logistics Agency
DLSIE	Defense Logistics System Information Exchange
DMAS	Dyna-METRIC Microcomputer Analysis System
DMBA	Depot Maintenance Business Area
DMIF	Depot Maintenance Industrial Fund
DMMIS	Depot Maintenance Management Information System
DMRD	Defense Management Review Decision
DMSC	Depot Maintenance Support Center
DoD	Department of Defense
DR	Deficiency Report
DRC	Dynamics Research Corporation
DRCQ	Depot Repair Cycle Quantity
DREP	Depot Repair Enhancement Program
DRIVE	Distribution & Repair in Variable Environments
DSO	Direct Support Objective
DTDRIVE	DeskTop DRIVE
Dyna-METRIC	Dynamic Multi-Echelon Technique for Recoverable Item Control
EA	Executive Agent
EEIC	Element of Expense Investment Code
EIS	Executive Information System

EMS	Enhanced Multi-Echelon System
ENMCS	Engine Not Mission Capable - Supply
EOQ	Economic Order Quantity
EOQ/VSL	Economic Order Quantity/Variable Safety Level
EPP	EXPRESS Priority Preprocessor
ERO	Engine Review Organization
EXPRESS	Execution and Prioritization of Repair Support System
FAMMAS	Funding/Availability Multi-Method Allocator for Spares
FD	Functional Description
FMS	Foreign Military Sales
FOC	Full Operating Capability
GAO	General Accounting Office
GOSG	General Officer Steering Group
GPSS	General Purpose Simulation System
GTACS	Ground Theater Air Control System
GWAM	Get Well Assessment Module
HOWMAL	How Malfunction
ICS	Interim Contractor Support
IM	Item Manager
IMDE	Integrated Model Development Environment
IMP	Inventory Management Program
IOC	Initial Operating Capability
IPD	Integrated Product Development
IPT	Integrated Product Team
IRD	Initial Requirements Determination
IREP	Intermediate Repair Enhancement Program
IRP	Inventory Reduction Plan
IRSP	In-place Readiness Spares Package (formerly BLSS)
IWIPS	International Weapon Item Projection System
IWSM	Integrated Weapon System Management
JEIM	Jet Engine Intermediate Maintenance
JEMS	Jet Engine Management Simulator
JLSC	Joint Logistics Systems Center
JR	Job-Routed
KAI	Kapos Associates Inc.
LAMs	Logistics Assessment Models
LANTIRN	Low Altitude Navigation Targeting InfraRed For Night
LCOM	Logistics Composite Model
LEAD	Logistics Enhanced Awareness Development
LL	Lean Logistics
LMI	Logistics Management Institute
LMS	Logistics Management System
LRU	Line Replaceable Unit
M&S	Models & Simulations
MAJCOM	Major Command

MC	Mission Capability
MDS	Mission Design Series
METRIC	Multi-Echelon Technique for Recoverable Item Control
METRICs	Measures of Performance
MIC	Maintenance Inventory Center
MICAP	Mission Capability
MM	Materiel Manager
MOD-METRIC	Modified Multi-Echelon Technique for Recoverable Item Control
MRC	Major Regional Conflict
MRC	Module Replacement Center
MRP	Material Requirements Planning
MRSP	Mobility Readiness Spares Package
MSOR	Multiple Sources of Repair
MTBD	Mean Time Between Demands
MTBF	Mean Time Between Failure
NIIN	National Item Identification Number
NRTS	Not Reparable This Station
NSN	National Stock Number
O&M	Operations & Maintenance
O&ST	Order and Ship Time
OA	Obligation Authority
OCM	On-Condition Maintenance
OIM	Organizational Intermediate Maintenance
OMENS	Opportunistic Maintenance Engine Simulator
OPR	Office of Primary Responsibility
OR	Operations Research
ORA	Operations Research Analyst
ORA	Operational Readiness Assessment
ORG	Operations Research Group
OSD	Office of the Secretary of Defense
OWLP	Overseas Workload Program
PA	Program Authority
PAA	Primary Aircraft Authorized
PACAF	Pacific Air Forces
PARS	Prioritization of Assets in Repair
PC	Personal Computer
PLT	Production Leadtime
PMC	Propulsion Managers Conference
PMO	Program Management Office
POM	Program Objective Memorandum
PPBS	Planning, Programming and Budgeting System
PRS	Propulsion Requirements System
PSE	Plan for Sustaining Engineering
QEC	Quick Engine Change
QPA	Quantity per Application

RADM	Resource Allocation Decision Model
RBIRD	Readiness Based Initial Requirements Determination
RBL	Readiness Based Leveling
RBS	Readiness Based Sparing
RDB	Requirements Data Bank
REALL	Reallocation Module
REALM	Requirements/Execution Availability Logistics Module
REMIS	Reliability & Maintainability Information System
RIPIT	Requirements Interface Process Improvement Team
RIT	Reparable in Transit
ROME	Reliability Operations Maintenance Engineering
RRT	Required Resupply Time
RSD	Reparable Stock Division
RSP	Readiness Spares Package (formerly WRSK)
RTF	Readiness Task Force
SAM	Sustainability Assessment Module
SAMIS	Security Assistance Management Information System
SB&CR	Stock Balance and Consumption Report
SBSS	Standard Base Supply System
SC&D	Stock Control and Distribution
SCS	Stock Control System
SDF	Statistical Demand Forecasting
SECDEF	Secretary of Defense
SEMR	Sustainment Executive Management Report
SESAME	Selected Essential Item Stockage for Availability Method
SFDLR	Stock Funding of Depot Level Reparables
SMBA	Supply Management Business Area
SMG	Supply Management Group
SMMC	Simultaneous Multi-Echelon, Multi-Indenture Computation
SOF	Special Operations Forces
SOR	Source of Repair
SORCE	Simulation of Removals of Components & Engines
SOS	Source of Supply
SOW	Statement of Work
SPD	System Program Director
SPO	System Program Office
SRAN	Stock Record Account Number
SRU	Shop Replaceable Unit
SSC	Supply Service Center
SSD	System Support Division
STOM	Supply to Maintenance
SWAP	Spares Wartime Assessment Procedure
TASC	The Analytical Sciences Corporation
TBD	To Be Determined
TLAM	Tactical Logistics Assessment Model

TLM	Two Level Maintenance
TNMCS	Total Not Mission Capable - Supply
TOC	Theory of Constraints
TQM	Total Quality Management
TRADES	Theater Repair & Distribution Execution System
UMMIPS	Uniform Materiel Movement & Issue Priority System
VSL	Variable Safety Level
WINLAM	Windows Integrated Logistics Assessment Model
WFA	Working Fund Account
WFM	War Fighting Metric
WRM	War Readiness Materiel
WRSK	War Readiness Spares Kit (now RSP)
WSAM	Weapon System Availability Model
WSMIS	Weapon System Management Information System
WSPAR	Weapon System Program Assessment Review

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Distribution List

HQ AFMC	
CC	1
CV	1
DP	1
DR	1
DRA	1
DRB	1
DRC	1
DRD	1
DRE	1
DRJ	1
DRM	1
DRS	1
DRT	1
DRW	1
DRX	1
EN	1
FMO	1
FMR	1
HO	1
IG	1
LG	1
LG-LL	1
LGI	5
LGM	1
LGP	1
LGS	1
LGT	1
PA	1
PK	1
SC	1
ST	1
XP	3
XP-AO	1
XPM	1
XPP	1
XPV	1
SAO	50
MGS	
CC	1
EN	1
SMW	1

ALCs	
OC-ALC/FM	1
OC-ALC/LI	1
OO-ALC/FM	1
OO-ALC/FMD	1
OO-ALC/LA	1
SA-ALC/FM	1
SA-ALC/LFTE	1
SM-ALC/FM	1
WR-ALC/FM	1
ASC/AL	1
AFSAC/CC	1
JLSC/MMD	1
HQ USAF	
LGM	1
LGS	1
LGX	1
SC	1
XOM	1
AFAFC/CC	1
AFLMA	
CC	1
LGM	1
LGS	1
LGT	1
LGX	1
LGY	1
XP	1
AFSAA/SA	1
ACC/LG	1
AMC/LG	1
AETC/LG	1
DLA/LO	1
PACAF/DOQ	1
PACAF/LG	1
USAFE/LG	1

AF ACADEMY/DF	1
AFIT/EN	1
AFIT/LG	1
AFIT/LAC	
AFIT/YCL	1
AIR UNIVERSITY/EC	1
DTIC	2
DLSIE	2
AMXSY-LM	1
RAND Corp.	1
LMI	1