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THE CAPABILITIES OF AGILE COMBAT SUPPORT UNDER
WARTIME CONDITIONS FOR THE 21ST CENTURY

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Preface

In the past, logistics has *pushed* the nation's wartime support to forces in the field to compensate for imperfect resource information and planning systems. As a result of this *push system*, expensive and wasteful stockpiles of materiel in CONUS warehouses and forward locations were created. The cold war model of globally pre-stocking huge quantities of materiel forward and then flowing equally massive quantities from home bases is not possible in today's austere political, economic, and high operations tempo environment. Since 1994, the USAF has operated under the Lean Logistics concept and has continued to refine operations under that system. The readiness processes during peacetime and wartime are continuously tested and refined for wartime applications.

Those concepts of logistics support for agile combat forces have evolved since the end of the Cold War. The USAF is moving away from deploying masses of materiel to support operational forces. The use of high-velocity, high-reliability transportation and information systems enables the logistician to get the right parts to the right place at the right time. Through these logistical concepts US forces will be able to increase their operational capability while reducing both a mobility footprint and costs. The USAF is extending the concept of depot level support versus large quantities of stock on-hand to include elements ranging from C4I, logistics, and personnel. US forces are exploiting information technology to reduce the blatant footprint to the deployed location. The

concept of receiving the stock required when the customer requisitions specific items will be an important part of improving this capability in the future.

This research paper highlights logistical concepts within the capabilities of Agile Combat Support and its effects on wartime conditions. This paper will discuss the assumptions made within these logistical concepts, explain the process, and make some recommendations for sustained logistics support.

Agile Combat Support as expressed in Global Engagement is the linchpin of any successful application of air and space forces. It is the unifying vision of logistics and defines the capability of highly mobile and rapid reaction forces. One of the USAF's core competencies, Agile Combat Support is unsurpassed combat capability across the spectrum of conflict. Agile Combat Support capitalizes on the advances of Lean Logistics concepts and processes, and amplifies their effects. These concepts span the spectrum of combat support from CONUS infrastructure and installation readiness to flightlines, at remote locations.

The future of USAF logistics can be summarized by General Viccellio, Jr. in the following words: 'Lean Logistics-Bridging the past and the future. We are in a time of transition when old assumptions about how to best achieve the aims of logistics are being questioned and new ways of doing business are being explored. We are strategically shifting the entire logistics system to capitalize on our strengths, obviate our weaknesses, and address the warfighting challenges we see on the horizon.'

I greatly appreciate the contributions of Colonel Jeffrey Ackerson, Headquarters Air Force, Directorate of Installation Logistics Transportation, Lt. Col Monroe Ratchford, Headquarters Air Force, Directorate of Installation Logistics Plans and Integration, Lt.

Col Laine Krat, Headquarters Air Force, Directorate of Installation Logistics Maintenance, Major Tillman Payne, Chief of Logistics Operations, Headquarters Air Force, Checkmate; Major Joanne Barbaro, Headquarters Air Force, Directorate of Supply; Major Marilyn Jones, Chief of Joint Readiness, Combat Support Center, Headquarters Air Force, Directorate of Installation Logistics Supply; Captain Robbin Vaughn, Project Manager, Air Force Logistics Management Agency. Their insights and comments to this research paper challenged me to create a product of significance and usefulness to the military.

Abstract

This research paper analyzes historic, current and future logistics support structures. The goal of this paper is to illustrate that the newly established logistics concepts are highly effective in supporting the Air Force core competency of Agile Combat Support while also identifying constraints and possible chokepoints.

Chapter one covers the pertinent historical perspectives and explains the factors that created Two-Level Maintenance (2LM), the USAF Depot participation in the process, and Lean Logistics. Chapter two explains the logistics concepts used to make up Agile Combat Support. After delivering these concepts, this author has concluded that the USAF cannot do it alone. Dependence lies on the joint community and our sister services for their logistical support. Chapter three brings together the essential elements of the supporting cast required to ensure success of Agile Combat Support. This chapter involves the agencies, organizations and joint support required to ensure Agile Combat Support is successful. Process improvement has been and will continue to be the catalyst in forging a seamless logistics infrastructure that provides reliable and responsive Agile Combat Support. The ability to forecast resources, deploy forces globally, commence early sustainment, reevaluate and pull specific resources, and transport rapidly are key to our success. Chapter four concludes with a summary of research assumptions and recommendations for improved and sustained Agile Combat Support.

Chapter 1

Previous Logistics Support Base

Logistics functions will incorporate information technologies to transition from the rigid vertical organizations of the past. Modular and specifically tailored combat service support packages will evolve in response to wide ranging contingency requirements.

—Joint Vision 2010

Historically, it has been the fate of logisticians to provide the lifeblood for combat forces to exercise enormous creativity and perseverance and then to be ignored in council and history. The old logistics concepts are too expensive and inflexible, and they create too large of a footprint.¹ USAF has an operational requirement to move ahead into a new era and the tools available to advance to the next level. One of the biggest factors driving the transition from the current system to the new system is the high cost associated with aircraft components. Funds dedicated to purchase components make up a significant portion of the USAF's budget. In fiscal year (FY) 1994, the Air Force's spare parts' budget was over \$500M. As a result of the end of the cold war, a declining defense budget, and the demand to institute change, the USAF was forced to develop a cheaper, but highly responsive logistics structure. These factors ushered in one of the new logistics concepts entitled 2LM.

Background on Two-Level Maintenance (2LM)

In July 1992, the Secretary of the Air Force (SECAF) and Air Force Chief of Staff (CSAF) directed the implementation planning of 2LM for the majority of weapon systems. The ground rules included there would not be any additional money allocated for spare parts and the establishment of two depot sources of repair for each avionics and engine line replaceable units (LRU) or commodities.

As the result of an approved Defense Management Review Decision (DMRD 983), the Air Force initiated the 2LM program in December 1992. Weapon System conversions occurred on an aggressive phase-in schedule throughout the FY94-99 Defense Planning Cycle. The DMRD cumulative savings to the DOD through FY99 are estimated to be over \$384.9M.²

In addition, a study was conducted on the Consolidated Engine Management System (CEMS). The study tracked the statistics for engines under 2LM. The final report indicated that the increase in transportation costs were justified due to the reduction of expensive inventory costs. During Nov 93, the depot repair time for 2LM avionics averaged 3 days against a 4.5 day standard. Reparable Pipeline Visibility (RPV), a long term trend analysis tool, provides the capability to forecast when resupply of parts will be required.

The 2LM goal was to convert USAF aircraft maintenance for avionics and engines from the previous three-level maintenance (3LM) to the 2LM program. 3LM consisted of aircraft maintenance being performed on the flightline, in the backshop, and at the depot. However, 2LM ensured that unserviceable parts can be rapidly moved through the repair cycle processes without a heavy reliance on excessive spare parts buildup. The conversion

to the 2LM program resulted in significant reductions of people, facilities, equipment, and spare parts associated with the intermediate level maintenance-base level repair. Aircraft maintenance previously accomplished by the intermediate level is now performed either on the flightline or in depot repair shops. Repair in the backshops has been reduced or eliminated altogether. Since the 2LM program is accomplished with fewer personnel assigned to base avionics and engine intermediate level maintenance shops, the mobility footprint in support of deployed forces is reduced. A reduced mobility footprint is important because it requires less logistics equipment and people to be deployed, thus increasing the element of surprise and security. Overall, unit readiness was enhanced in four ways: 1) Improving the repair pipeline processes; 2) Rapidly moving reparable avionics and engines to depot repair centers—high velocity parts movement; 3) Distributing parts door-to-door from commercial and military express carriers; and 4) Improving state-of-the-art command, control, communications and computers (C4) for visibility and control of asset—improved flexible options to the warfighter.³

The primary challenge for 2LM success was that depot repair becomes tied directly to Air Force flightline and unit sortie generation capabilities. Therefore, depot repair management and the availability of procurement assets were key factors in the readiness of weapon systems worldwide. The Secretary of Defense directed the restructure of the Air Force depots to a Defense Depot Management Agency under the Office of the Secretary of Defense control. Therefore, a greater level of interest and support was given to the program to ensure an adequate level of support was provided.

Another significant challenge was funding for Depot Level Reparables (DLR). The avionics and engine parts were placed under the Defense Base Operating Fund (DBOF)

guidelines for those parts repaired in the intermediate maintenance shops. The USAF's position was to decrease costs by reducing people, equipment, and repair parts at each unit.⁴ The moving of avionics and engine parts to designated depots for repair accumulated huge savings. Unit budgets were adjusted due to decreased requirements to spend funds on 2LM parts maintained and repaired at depots under DBOF. Although the FY93 sustainment budget was short approximately \$425.9M in the repair accounts, 2LM represented only a small portion of the total shortfall. Sufficient repair funding is essential to the 2LM program success.

Furthermore, the Lean Logistics concept is an outgrowth of the Air Force's 2LM program. The key logistics concepts to support 2LM under wartime conditions are: Air Mobility Express (AMX) and Battlefield Distribution. These two programs are needed to provide time-definite delivery of mission capable (MICAP) parts. AMX is a concept during war time conditions and provides dedicated airlift for supplies that are needed in the battlefield immediately.

As a result of budget constraints in FY94 and beyond, the SECAF directed the study of 2LM in March 1992. The 2LM study originally had no predetermined force reductions or mandated savings. Rather, the goal was to determine if there were less expensive ways to support Air Force aircraft while sustaining readiness. The study focused on implementing 2LM where it made sense and concentrated on cost savings and impacts.

In a test conducted to properly analyze the supportability of the 2LM logistics system, the results were most informative. The F-16 aircraft was selected as the weapon of choice for this study due to its large logistics tail and requirement for many maintenance personnel to operate the backshops.⁵ The concept to manage and optimize reparable

pipeline performance was developed and tested. The concept was tested during demonstrations with the F-16 aircraft from Oct 91 through Sep 93. The two critical areas that were a significant part of this test were the Lean Logistics concept and 2LM. The test report indicated that Lean Logistics requires rapid depot repair (both organic and contractor) and high velocity two-way movement of parts.⁶

Air Force Materiel Command (AFMC) is now the first line source of avionics repairs. Visibility of the spares in transit (e.g., in the pipeline) is essential to ensure 2LM meets the customer's requirements. The Air Logistic Centers (ALC) and Major Commands (MAJCOM) worked together to provide interim pipeline visibility. The performance data was collected through a combination of manual data collection and locally developed systems relying heavily on the Air Force Logistics Information File (AFLIF). Nevertheless, the success of 2LM depends significantly on the participation in 2LM of Air Force Depots, and the tireless efforts of local units to make the program work. Next, let's take a look at the USAF depot's participation in 2LM.

The Air Force Depot's Participation in 2LM

The USAF depots initially focused on base-level aircraft maintenance by consolidating engine repair work with existing depot maintenance, thereby, reducing personnel requirements. The combined reduction equated to an approximately 15% decrease of total base-level "blue suit" maintenance manning. Although there would be an increase in depot staffing of nearly 1500 authorizations, the goal was to decrease 5000 work force authorizations over the Future Years' Defense Plan. Subsequently, the 2LM conversion had significant increases in both avionics and engine workload. Tinker Air Force Base is

an integral part of the USAF's mobility footprint. With fewer troops in the combat zone, units arrive in theater faster by deploying less equipment. The reduced inventories minimized handling and eliminated non-value added storage. The participation and influence of USAF depots have constituted another vital logistical concept known as "Lean Logistics."

Lean Logistics

The Lean Logistics concept is an integrated, independent, repair, supply and distribution process that leverages transportation to reduce the deployment of people, equipment, and stocks. For example, a smaller mobility footprint is dependent upon early and regular resupply. The (AMX) and Battlefield Distribution are needed to provide time-definite delivery of MICAP and resupply parts to smaller mobility footprints. In other words, the USAF is evolving from a supply based to a transportation based logistics system to provide greater combat capability at reduced cost in personnel, equipment, and inventory. *Lean Logistics* is the USAF initiative that focuses on dramatically improving logistics support processes by applying "best business practices" across wholesale and retail logistics functions.⁷

Moreover, this chapter provided background leading to the employment principle of 2LM. The background of 2LM is important because it provided the foundation for the current efforts to restructure the logistics system and the bases for implementing Lean Logistics. The next chapter discusses the logistics concepts used to ensure the logistics structure is responsive and continuous.

Notes

¹General Henry Viccellio Jr., AFMC Commander, “We’re Moving at a Wartime Pace to Retool Material-Support Machine,” *Leading Edge*, March 1996, 2.

²Cost Assessment of Two-Level Maintenance, AFLMA Project Number LM9505310, February 1996

³Analysis of the Air Force Cost Analysis Improvement Group Cost per Flying Hour Process, AFLMA Project Number, LM96299020, September 1996

⁴Air Force Logistics Management Agency, “Assessment of Two Level and Three Level, Jet Engine Intermediate Level,” *Air Force Logistics Management Agency Operations Report For Fiscal Year 1995*, 21 Jun 95, 5.

⁵Analysis of the Air Force Cost Analysis Improvement Group Cost per Flying Hour Process, AFLMA Project Number, LM96299020, September 1996

⁶Consulting Report, Exploring F100-PW-220 Cost and Readiness Issues, AFLMA Project Number LM9609400, May 1996

⁷White Paper, The Implementation of Lean Logistics in the USAF, February 1995, 3.

Chapter 2

Logistics Concepts

In addition to improving operational results through Lean Logistics is operating more closely with the other Services across the spectrum of our operations. Many of our new initiatives are joint programs, with improvements in response time and information management resulting in better support to all Services.

—Air Force Logistics
White Paper, Feb 96

Improving the Speed and Flexibility of the Logistics Process

One of the most vital processes within logistics is to increase Operational Interoperability using high velocity processes in-lieu of large inventory levels to manage mission and logistics uncertainty. Result: smaller mobility footprint, and reduced inventories and cost. Lean Logistics emphasizes improvements to those processes that most directly affect the ability to deploy ready, effective forces to theater Commander in Chief (CINCs). The logistics operating formula is calculated as follows: integrated/interdependent repair, inventory and distribution processes equal improved support. The units deploy with Mission Ready Spares Package (MRSP) and rely on express delivery to provide *time-definite, highly reliable* movement of critical items (MICAPs and replenishments) from CONUS suppliers to the warfighters. The effective utilization of the Lean Logistics principles has created a “system in balance.” The

segments of logistics are fully optimized and integrated resulting in an effective infrastructure and efficient inventory needed to support weapons systems in peace and war. Inventory reductions in both peacetime and wartime operating stocks' readiness spares packages will be achieved by significantly reducing pipeline times. The pipeline times are defined as the amount of time that elapsed from the time of order to the time the part is received. Reducing the number of parts in the pipeline has significantly increased the demand to rapidly move parts and hopefully will result in a more improved repair process. The value of one day's worth of parts flowing through the pipeline is estimated to be \$36M (sunk cost; money already invested). Any pipeline time reduction will result in net savings in replenishment cost as inventories are reduced to the "new pipeline." Analysis clearly shows that an increased cost of express transportation is dramatically offset by a reduction in high cost inventories. Next, let's take a look at the forerunner to Lean Logistics, which is Focused Logistics.

Focused Logistics

Focused logistics is largely based on the USAF's successful implementation of Lean Logistics initiatives. Since logistics connects the nation's economy to warfighting forces, it is the foundation of America's combat power. Focused logistics brings precision to a previously imprecise art by exploiting information technology and reengineered business processes.¹

Improved command and control of resources allow air and space forces to deploy and conduct air operations with reduced quantities of materiel tailored for any contingency. Depot processes streamline and incorporate state-of-the art business practices, as well as

release materiel in a much more timely fashion. Time-definite transportation completes the support cycle by rapidly delivering needed resources directly to the warrior in the field. Throughout focused logistics, process integrated information systems provide total asset visibility and the capability to re-direct resources as the situation dictates. Focus Logistics took a step further in increasing speed and sustainment than its forerunner--Lean Logistics.

The logistician is moving away from the idea of deploying materiel in mass. The goal is focused on deploying “on-time delivery” of those assets necessary to sustain the force. It’s a tough balance to reduce the load on heavily tasked transportation and supply systems while ensuring that operators have the tools they require. Nevertheless, as we move on to lean and innovative business practices, we will reflect this reality as the present and future state-of-the-art operations.

Lean, Innovative Business Practices

If the USAF is to succeed in its modernization and quality of life initiatives, the leadership must relinquish the use of resources through better business practices. We cannot afford to continue traditional means of doing business in acquiring and supporting our forces.

Several demonstrations and conversions to Lean Logistics are yet underway. Since the transportation initiatives were proven during Operation Desert Storm, new efforts will focus on depot and contracting process improvements.² Emphasis is placed on converting entire production shops to high-velocity production. Once production rates are improved

and stabilized, inventories will be systematically reduced as the “new” pipeline matures, thus eliminating or deferring replenishment buys.³

Lean logistics is an excellent example of an initiative focused on dramatically improving logistics support. The use of applying “best business practices” across wholesale and retail logistics functions will result in a reduction in costs and an improvement in customer support. “Best business practices” exercised under Lean Logistics include: door to door distribution using express carriers, repair and return packaging (R2P), flexible and responsive repair processes that sustain quality repair, quick response contracts (both depot repair and bit & piece support), and direct user involvement (user versus depot) in the spares’ distribution decisions to achieve maximum readiness.

The 2LM program focuses on moving avionics parts using the R2P. The R2P applies commercial “best practices” to move reparable and serviceable parts at high velocity. The process includes using reusable containers, pre-printed return address labels, express carrier service, and bar coding. Door to door delivery (D-3) of reposables directly to the depot 2LM repair shop and the delivery of serviceable “part stores” on the flightline are also cost effective processes. As Lean Logistics initiatives begin to reduce spare part’s inventories, more weapon systems and stock numbers will migrate to R2P support status. Engines are being transported to CONUS by commercial transportation to ensure responsive and cost effective services are provided.

Another lab initiative is Mail-like Matter Movement (M3). The concept incorporates the use of controlled express carrier networks for CONUS classified shipments. Not only

has M3 boasted a record of loss-free service, but it delivers faster and significantly cheaper than traditional constant-surveillance shipment modes.

The 2LM business practices have shown some impressive savings. The savings of \$385M were the direct result of DMRD. Only by adapting state of the art business practices can we achieve not only a quantum increase in parts velocity, but operate with fewer operational layers and people.

D-3 is the foundation of the state-of-the-art business practices. The USAF has laid the foundation for other business practices when they implemented the commercial practice of door-to-door distribution in the CONUS. The USAF plans to adapt other business practices to enhance productivity.⁴ But for the present time, let's take a look at how D-3 works.

The maintenance technician removes the unserviceable part from the aircraft and replaces it with the serviceable part. The unserviceable part is placed in the reusable container. The pre-addressed return label is superimposed over the original label. The container is closed, and returned to the flightline express delivery/pick-up point. Finally, the express carrier picks up the shipment and transports it to the addressee for repair. The objective is greater efficiency resulting by passing logistics nodes and direct shipments at the appropriate velocity to the ultimate customer.⁵

Furthermore, the USAF is still reviewing the pipeline standards and 2LM door to door movement time standards. They will also analyze the transportation structure available to meet the standard, and recommend a peacetime and wartime plan for 2LM movement. The performance standards and metrics are in place to measure standards either at or below the Uniform Materiel Movement Issue and Priority System (UMMIPS).

The UMMIPS standard must be held in order to achieve the movement velocity necessary to maintain mission capable rates. Avionics will be moved on express carriers limited to CONUS shipments. Engines are transported by commercial carriers within the CONUS and by AMC outside CONUS.

Intermediate component repair was accomplished by the overseas units. The tonnage is expected to be approximately 85 tons per month initially and expected to grow to 123 tons per month as more engines are phased into 2LM. The growing humanitarian requirements and new 2LM engine business certainly indicates there is ample opportunity to meet minimal air crew training requirements. The USAF can provide incentives to the Civil Reserve Air Fleet (CRAF) cargo carriers to encourage their continued support of the program. The USAF is constantly searching for ways to reduce the two level mobility footprint. Reducing the mobility footprint will increase the speed and flexibility of the agile combat support capability.⁶

Reduced Two Level Mobility Footprint

The 2LM concept reduces the maintenance infrastructure at the unit's intermediate level for aircraft avionics and engines. The 2LM repair work is moved to the flightline, or to depot 2LM repair. The readiness is maintained by accelerating the movement of the unserviceable parts through the repair pipeline times. The 2LM concept is accomplished by the following 5 methods: 1) base process improvements, 2) use of express carriers, 3) door to door delivery, 4) flexible and rapid repair, and 5) express return of 2LM avionics parts. The greatest benefits desired are as follows: 1) It cuts engine shipment and handling times in half 2) The program 2LM wartime support focuses on "resupply" of Readiness

Spares Packages, (RSPs) rather than “In-theater repair” 3) It reduces mobility “footprint” for the employed CINC, and 4) Reduce requirement to “haul” avionics and engine intermediate packages up-front. These benefits enable strategic lift to carry combat and sortie generation packages and RSPs rather than repair packages. The *Reduced Mobility Footprint* is the goal. The air campaign is conducted with the same thrust using less airlift, deploying fewer people and with engaging less equipment.

For instance, by eliminating test equipment, 2LM reduces F-16 squadron deployment airlift by four C-141 aircraft. During a two major regional contingency Lean Logistics can reduce the mobility footprint by eliminating over 175 C-141 missions. The mobility footprint reduction was proven during the Global 95 exercise. This exercise confirmed that the express transportation from the depots improves customer response time and reduces MICAP time.⁷

Express Transportation Initiative

The 1996 DOD and USAF strategic plans direct the restructuring of our logistics process to reduce cycle times, inventory, and pipeline time, that are consistent with Lean Logistics tenets. Total inventory cost benefits outweigh the premium to pay for commercial service. The Standard Base Supply System (SBSS) has begun coding base retail requisitions for express transportation. The Defense Logistics Agency (DLA) express transportation system is under going change and is not expected to be deployed until October 1997. The DLA does not envision manually overriding shipment planning as a viable option at this time. The Logistics Metric Analysis Reporting System (LMARS)

will begin generating metrics and keeping statistical data on the total logistics serviceable items in the pipeline in July 1997.

Air Mobility Express (AMX) is a concept that provides seamless transition from peacetime dependence on high-velocity commercial express carriers to effective military express delivery during war/contingencies. The AMX is a core concept essential to the application of 2LM and USAF Lean Logistics. AMX concept evolved out of the Operation Desert Shield/Storm air express mission. “Desert Express (DE)” Cargo space was allocated to each Service and was easily transitioned to CRAF carriers. Patterned after commercial overnight delivery services, cargo arrived at Charleston AFB by 1030 daily. Two hours later, following sorting and consolidation, the cargo was airlifted to Saudi Arabia via direct C-141 mission. The AMX system is activated by United States Transportation Command (USTRANSCOM) concurrent with the Chairman Joint Chief of Staff (CJCS) execution of a CINC operations order. Through Lean Logistics, USAF mobility footprint will be reduced, thus reducing demand on deployment airlift; however, early activation of sustainment lift between theater, becomes critical. Theater CINCS must establish rapid intra-theater distribution systems to connect with the entire Rapid Distribution System (RDS). The RDS assets await the arrival of AMX at the theater distribution hub (similar to the CONUS hub). After a fast sort, cargo is delivered directly to forward units.⁸ The key to a long term theater campaign is the ability to be able to sustain the forces in combat.

Sustainment

The goal of sustainment is to enhance operational activities to the warfighting CINCs, and to improve efficiency of weapon system support through the pursuit of “best value” processes and products. The USAF has fully transferred from a concept of operational sustainment via “push” resupply to one based on accurate information, responsive production, and daily, time-definite airlift. The USAF logistics community has demonstrated the capabilities of Agile Combat Support first in the context of the Air Expeditionary Force (AEF), and once mastered, for the 21st Century Joint Force.⁹ The need to pursue the creation of effective battlefield distribution is extremely important for effective and timely delivery of supplies. We must pursue improvements in our depot process that facilitates a leaner and more effective process to move smoothly into the 21st century.

Battlefield Distribution is a US Army responsibility directed under Title 10. Battlefield Distribution is providing transportation of supplies from the port of entry to the deployed location (foxhole). The concept of time-definite delivery means delivering the part “just in time” to fulfill the needs of the combatant units without maintaining huge supply stock piles. The theater’s *Battlefield Distribution* system quickly moves critical items within theater and delivers them to forward bases. Mission Ready Support Packages (MRSPs) will be kept full through continuous resupply for follow-on taskings. Early, continuous MRSP replenishment is a hedge against uncertainty of pipeline disruptions of repair requirements at the depots. A logistics command and control (C2) aid the process by providing real time visibility and control of all logistics resources. C2 is necessary to employ and sustain forces across the full spectrum of any military operation.¹⁰

The ability to sustain the forces and ensure the success of agile combat support, requires a supporting cast. Next, let's discuss the tenants of the supporting cast, and its role in providing speed and flexibility to our agile combat support structure.

Notes

¹Internet Explorer, "Global Engagement, A vision for the 21st Century Air Force," (Maxwell AFB: War and Theater Level Studies Department (DEB), ACSC), Dec 96, 3.

²Michael R. Gordon and General Bernard E. Trainor, *The Generals' War*, (Canada: Little, Brown & Company), 1995, 60.

³Internet Explorer, "Agile Combat Support, Core Competency," (Maxwell AFB: War and Theater Level Studies Department (DEB), ACSC), 6.

⁴Depot Repair and Budget Forecasting in a Lean Logistics Environment, Project Number LS951250, September 1996

⁵ Analysis of Location options for Lean Logistics Consolidated Serviceable Inventories, Project Number LS952900, September 1994

⁶Re-engineering Weapon System Management Information System/Sustainability Assessment Module-LS941580

⁷C-5/C-141 Supportability Analysis, Project Number LS942171, March 1995

⁸Doctrine for Logistic Support of Joint Operations, *Joint Publication 4-0*, 27 Jan 95,

⁹Internet Explorer, "Agile Combat Support, Core Competency," (Maxwell AFB: War and Theater Level Studies Department (DEB), ACSC), 6.

¹⁰Headquarters United States Air Force/Logistics, *Partners in Global Reach and Power: A Vision for Air Force Logistics in 2025*, 15 Jun 96, 17.

Chapter 3

Supporting Cast

In order to make optimum use of the technologies and operational concepts discussed earlier, we must carefully examine the traditional criteria governing span of control and organizational layers for the Services, commands, and Defense agencies. We will need organizations and processes that are agile enough to exploit emerging technologies and response to diverse threats and enemy capabilities. As we move forward, we may require further reductions in supervision and centralized direction.

—Joint Vision 2010

Rapid Global Mobility

Our ability to rapidly respond to the full spectrum of contingencies from humanitarian relief, to peacekeeping, to major conflicts is a prerequisite to attaining our goals, and fundamental to the successful implementation of *JV 2010*.¹ We are continuing to aggressively pursue systems and processes that increase our capability to respond anywhere and at anytime with decisive influence. An excellent example of our need for rapid global mobility is the AEF. The AEF operates with lighter packages while enhancing operational capability. Equally promising is the combination of improved, logistically sound, acquisition processes. The technology advancement bodes well for significant improvements in reliability and maintainability of future systems and equipment. These improved processes, as do those of our sister services in their pursuit of Focused

Logistics, rely on an integrated information system. We must continue improving the process that will allow immediate and transparent access to resources on a global scale. The CRAF is constantly playing an increased role in the rapid global mobility capability. The CRAF is called on in peace and war time to ensure our agile combat support is forever vigilant.

Civil Reserve Air Fleet (CRAF) key in express service

Express carriers contributed the largest number of cargo aircraft to our effort in the Persian Gulf (Desert Shield/Storm). Even now commercial express carriers constitute nearly 50% of the total (Stage III) CRAF cargo fleet. Federal Express has dedicated 40% of its jet aircraft to CRAF stage III. Manpower processes need to be examined to encourage carriers to commit aircraft to the CRAF. USTRANSCOM needs to establish policy stating that defense (hopefully all U.S. Gov't) business will go only to carriers that commit 10% of their aircraft to CRAF. Contingency CRAF contracts would then be entered into with carriers who want DOD business. Components would only approve tenders of CRAF carriers allowing customers to select the carrier's tender that provides the best service at the least cost. Tenders are offers by carriers to provide transportation on specified services (e.g. confirmation of delivery) at a fixed cost. Unlike contracted lift, tenders can be approved, changed, and executed quickly without the management overhead necessary for contract oversight. Tenders, essentially places the user in control, allowing the customer to select the CRAF carrier that provides the best service and at lowest cost. If performance is substandard, the customer simply selects another carrier with an approved tender on file. No manpower or paper intensive process is required for

cure notices, etc.. The CRAF has been instrumental in ensuring our parts are delivered to the warfighter “just in time” of need, thus reducing the logistics cycle times. The faster the warfighter receives the items required, the better the capabilities of agile combat support is proven flexible and responsive.

Reducing Logistics Cycle Times

The new concept says: “Why wait? When something breaks, it’s shipped express and goes directly to repair, and is returned into the system again as a good spare.”² As we reduce infrastructure to meet fiscal constraints, we become increasingly aware that cycle time reduction is the logistics force multiplier needed to maintain our system’s vitality in a downsized environment. Industry has embraced just-in-time delivery to dramatically reduce on-hand inventory. The USAF is leveraging fast logistics cycle times along with reductions in logistics cycle variability to shrink stockpiles of our most expensive spares and eliminate an entire tier of maintenance infrastructure. Reduced cycle times are not only a peacetime windfall. By accelerating replenishment during combat, our warfighters can deploy and operate with less inventory and maintenance capability. This reduction in our mobility footprint enables us to put more “shooters” into the theater faster, boosting wartime flexibility and effectiveness.

The focus on rapid cycle times has driven dramatic process improvements--and achieved eye-opening results--in all of our logistics functions, at all organization levels. By eliminating intermediate level maintenance activities at most of our wings, we have reduced our overall cycle time for critical reparable parts, and slashed both personnel and deployment lift requirements. When applied to engine repair, the 2LM philosophy cut

over 33 days from our average engine overhaul cycle. Our bases have also capitalized on an innovative return shipment labeling process devised by the mail order industry, which has condensed evacuation time for broken parts from several days to a single day.

With 2LM, we have consolidated much of our repair capability at our depots. Even so, we continue to reduce cycle times at those activities. The Air Logistics Center depots moved from a batch repair process for like spares, to one that inducts and repairs all types on demand. Individual shops standardized these procedures and reengineered their internal processes and inventory levels. For example, the Radar-Navigation repair shop at Warner-Robins ALC that reported a 52 percent drop in items requiring repair in the depot (work-inprogress), and slashed shop time processing from 20 to 2.8 days. Another example is that the Oklahoma City ALC showed similar gains, cutting flow days in the Oxygen Shop from 10 to 6 days.³

Collectively, these changes in repair processes have already netted savings of over 4400 manpower positions and \$259M in the FY94-96 budget. Projected savings for FY97 include an additional 1672 manpower positions and \$800 million.⁴

Our transportation functions have likewise had a positive impact on cycle times. Logistics policymakers are recognizing that investments in transportation and related information is more than offset by potential inventory reductions and improved supply-chain responsiveness. Again, we have looked to industry to provide innovative ways to reduce our cycle times while maintaining readiness. The door to door, time-definite delivery strategies pioneered by commercial express carriers are now becoming the peacetime and wartime standard for distributing our readiness critical assets. Championing those strategies has become job one for the Express Delivery Reinvention

Lab, a SECAF-chartered organization operating under the auspices of Vice President Gore's Reinventing Government initiative and the Defense Performance Review. The Reinvention Lab's mandate to adopt leading edge business practices and develop rapid prototypes have paid off with a number of process improvements and information system breakthroughs.⁵

These leading edge logistics initiatives are noteworthy in another regard. They illustrate the value that logistics information and strategic partnerships play in reducing cycle times. Bundling commercial transportation with logistics information and other value added services leverage even greater cycle time benefits, providing intransit visibility, accelerated customs clearance, functional process integration, and rapid inbound receipt processing. The Reinvention Lab has discovered that tailoring these services to USAF logistics processes requires a continued partnership with industry. For agile combat support to be a complete success it will take the efforts of USAF Depots, Defense Logistics Agency (DLA), and our sisters services to work together as a joint team. The DLA has worked consistently hard on reducing logistics cycle times and providing a new concept called "Premium Service."

DLA Premium Service

The DLA has developed premium storage, ordering, and delivery services for highly valued customers or mission critical assets above what it provides today. Guaranteed delivery will be supported by non-performance penalties. Potential customers include military service, field operating agencies, and any other government activity. The DLA will underwrite some start-up costs and guarantee quick response to customer

requirements to offset costs to customers. Rates (e.g., prices) for level of service and operation costs will be competitive with DLA rates.

The inventory process is in the control of the user and based on operational requirements. The user decides where to vector parts not AFMC. The user fills requisitions by direct submission to the carrier streamlined requisition process. Carrier effects overnight movement for delivery by 1030 the next day, or within 48 hours for international movement. High velocity movement can improve mission support. Rapid movement may reduce inventory requirements.⁶ The DLA potential to reduce high cost inventory requirements at the retail and wholesale level via high velocity movement is a promising way to improve customer support.

As the numbers of weapon systems under 2LM increase and spare parts' inventories begin to be "leaned out," the transportation system to support this environment must be fast, reliable, and stable. Commercial transportation industry that is sophisticated, fast, and flexible can provide rapid world wide movement door to door. Where customs are not a problem for express eligible freight, commercial carriers out perform AMC movement at, near, and sometimes for less cost. Increases to transportation budgets will be offset by reduced inventory requirements. It is critical to know where your parts are within the pipeline. The Advance Traceability and Control for the Air Force provides the logistician the information needed for accurate information for repairable and consumable assets.

Advance Traceability and Control for Air Force (ATAC-AF)

ATAC-AF is the pipeline management tool that provides logistics manager's visibility of the retrograde and serviceable pipelines for reparable and consumable assets. ATAC-AF analyzes supply, maintenance, and transportation pipeline data for unserviceable, serviceable, and consumable assets. The system provides users "on-line" capability to query the system on the status of a single requisition, shipment, etc., as well as provides cumulative reports on pipeline performance. ATAC-AF was originally designed to track the retrograde pipeline for 2LM avionics parts; however, it expanded to include total in-transit and in-process visibility of both the retrograde and serviceable pipelines for 3LM, 2LM engines, and consumable assets. The Navy is the lead agency to develop ATAC for the Air Force and will base their efforts on ATAC-NAVY.

The Joint Total Asset Visibility (JTAV) system is vital to any battlefield and units are heavily depended on its capabilities. The JTAV has the capability to provide users with timely and accurate information on the unit location, movement, status, identity personnel, equipment, and supplies. "Operational commands are not just along for the ride; they want to know when they are going to arrive."⁷ The JTAV also includes the capability to act upon that information to improve overall performance of DOD's logistics practices. It is one of the top priorities in the DOD Logistics Strategic Plan. The Army, in turn, established the JTAV Office to complete and execute the JTAV Implementation Plan, execute the Joint Logistics Management Information System and support the CINCs in attaining enhanced JTAV. Over 20 personnel representing all services and working closely with their service staffs are assigned to the JTAV Office. From both a functional and technical perspective, the JTAV Office will develop architectures that will provide the

long-term DOD JTAV solution. In the meantime, selected prototypes and demonstrations will capture information on JTAV initiatives to assist in the overall development. Examples include: Army Battlefield Distribution System, which synchronizes materiel and movement management at all levels in a theater of operations, thereby ensuring optimal use of limited transportation resources; Army Velocity Management, which gets logistics support into the hands of the soldier as fast as any first-rate commercial firm while providing a hedge against unforeseen interruptions in the logistics pipeline; Air Force Lean Logistics, which increases operational capability using high velocity processes instead of large inventory levels to manage mission and logistics uncertainty. Defense Total Asset Visibility (DTAV) Plan represents the culmination of a yearlong effort to identify the necessary policies, procedures, and methodologies to obtain essential visibility of materiel assets. By establishing a phased implementation schedule, the DTAV Plan offers a workable means of securing significant improvements in the areas of materiel tracking, management, control, intransit, in-storage, and order status visibility. The objectives are the establishment of a single standard transportation system. The identification number shall be employed as a common reference identifier in supply (shipment status) and transportation operations.⁸

Notes

¹Joint Vision 2010

²Colonel Bailey, Air Force Material Command/Chief of the Lean Logistics Program Office, "Related...But Different," *Leading Edge*, Mar 96, 9.

³Oklahoma City Air Logistics Consolidated Serviceable Inventory, Project Number LS953184

⁴Lean Logistics Retrograde, Shipment Policy, Project Number, LS950801, July 1995

⁵Sacramento Air Logistics Center Logistics Consolidated Serviceable Inventory Levels, Project Number LS953185, January 1995

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⁶Headquarters United States Air Force/Logistics, Partners in Global Reach and Power: A Vision for Air Force Logistics in 2025, 15 Jun 96, 19.

⁷Major General Goddard, Air Combat Command/Director of Logistics, “Customer’s Viewpoint,” *Leading Edge*, Mar 96, 10.

⁸Lean Logistics Retrograde Shipment Policy, Project Number, LS950801, July 1995

Chapter 4

Assumptions and Constraints

To sustain the Armed Forces and instill these operational concepts will require high quality people-the key ingredient for success. The judgment, creativity, and fortitude of our people will remain the key to success in future joint operations. Turning concepts into capabilities requires adapting our leadership, doctrine, education and training, organizations, and materiel to meet the high tempo, high technology demands posed by these new concepts.

—White Paper, The Implementation of Lean Logistics in the USAF
February, 1995

Bottom Line

Future wars and conflicts will be fought jointly. American's armed forces are smaller than 40 years ago, and the government has decreased the percentage of forces permanently stationed overseas. Why is a joint vision needed? The American people expect the US military to win. They also expect efficiency and resourcefulness. To retain effectiveness, we must be fully joint: institutionally, organizationally, intellectually, and technically.¹ We need the support of our sister services to sustain in battle. We need the U.S. Army to complete their Title 10 responsibility of battlefield distribution. The bulk of our cargo is transported by roll on roll off ships. We must ensure jointness is included as a way to conduct the planning of operations and the execution of the overall plan.

Assumptions. Weapon system reliability and maintainability are the keys to ensuring sustainment requirements are met. The USAF must not only invest in reliability and maintainability modifications of existing systems, but must ensure reliability is built into all new systems. Multitalented logisticians capable of managing weapon systems (from initial acquisition to final disposal) across the entire spectrum will be required to manage the system as a whole. In order to reduce support costs, processes will be reengineered and selected support functions will be competing in a best value process. The procedures will be based on public and private competitions for non-core functions, and partnering with private sector contractors to use excess depot capacity. The logistics system will become more integrated, evolving into a seamless system to include processes, organizations, career patterns, and support systems. Sustainment concepts and assumptions will be demonstrated and evaluated through the Battle Lab process.

Focused Logistics and its forerunner, Lean Logistics, will provide the Joint Force Commander with an air force that is more mobile, responsive, efficient and significantly more potent. Focused Logistics may never completely turn the logistician's task into a system that answers every perceivable question. However, the future of USAF logistics will maximize both technology and resource management to provide unparalleled combat power to the joint warfighter.

We need focused logistics because it is the bridge to the 21st Century. There are four main reasons supporting this link to the 21st Century 1) our world is undergoing rapid and drastic change, 2) we no longer have unlimited resources, 3) our threat is unpredictable and dynamic, and 4) our customers, the Air Force's other major commands, need support that is responsive, fast and less costly.² Focused logistics radically alters logistics functions

by improving and streamlining policy processes. The management structures in repair, inventory, and distribution are greatly improved, thus providing support to the warfighter at a record pace. Focused Logistics has the potential to provide equal or better operational mission capable rates, effectiveness, and quality.

According to General Henry Viccellio Jr., AFMC Commander, “Customers are the real concern. Let’s not be confused on the core issue here. We are in a period where the convergence of world events, diminished funding and limited manpower are driving change. These factors do not compose the need for change. Our customers, the major commands, wings and squadrons that depend on AFMC to provide the materiel support essential to a ready force, are the fundamental, last analysis reason we must change.”³

The **Logistics Concepts** are the backbone of the logistics structure. These logistics concepts today require speed and flexibility to ensure the structure is responsive to the customer’s needs. They must be monitored and supported from base level to the CINC. If these concepts are properly executed, Agile Combat Support which is required for our units can be achieved. This will be a constant challenge for the units to maintain their combat missions in this new high operations tempo environment. “Our vision is based on the premise that only air and space power provide the nation the ability to find and hit strategic centers of gravity directly. The USAF has the ability to operate at operational and tactical levels of war.”⁴

The **supporting cast** are important in implementing the logistics concepts. For the concepts to be effective, the supporting cast must be fully successful. Rapid global mobility is essential to ensure that the parts are received when requested by the customer. The DLA is key with their premium service initiatives and high velocity warehousing.

When tabulated, the result is reduced logistics cycle times. Therefore, the customer receives the support that is required. With all of this being accomplished, the end result is a successful air campaign, thus contributing to the capability for victory to our fighting forces.

Constraints. The strategy of expanded peacetime use of commercial transportation is consistent with wartime use of CRAF carriers. Desert Express and the Military Overnight Express allowed the USAF to practice operations that could be used in future contingencies. Express Delivery enables us to practice providing the flexibility and speed needed to move assets through the logistics pipeline. Desert Express was the code name used during Operation Desert Storm to move highly desirable assets that required transportation in and out of the theater. Rapid two way movements of 2LM reparable and serviceable engines and avionics are keys to the success of any air campaign. Rapid two way movement is important because of the vital advantages we sustain in the air. Expanded reliance on commercial transportation instead of organic is occurring at a rapid pace, while providing outstanding results.

The reduced two level mobility footprint improves the element of surprise and increases the force's security. However, this is a constraint due to the fact that USTRANSCOM is "lukewarm" to the Air Mobility Express Concept. The USAF must address the disconnection between the Air Force concept of force sustainment via rapid transportation starting on deployment Day I and the reluctance of theater CINCs to accept this concept. USTRANSCOM prefers to implement Air Mobility Express when all Military Strategic Airlift is exhausted. If the decision is made to implement Air Mobility Express after the Strategic Airlift is exhausted, that would create a backlog in delivery of

assets to the battlefield. Everyone wins something and no one loses everything. The only clear winner is the ability to deploy, employ, sustain, and redeploy in the manner we would use daily in the system.

Notes

¹Joint Vision 2010

²Leading Edge, March 1996, page 7

³Leading Edge, March 1996, page 2

⁴Strategy Vision and Core Competencies, General Ronald R. Fogleman, CSAF

Appendix A

Definition of Terms

Air Mobility Express. (AMX) is the military adaptation of commercial overnight delivery that consists of (1) express carrier's CONUS infrastructure, (2) AMC airlift (organic/CRAF), and (3) the theater distribution system for express shipments. CRAF carriers provide DOD not only the use of aircraft, but their integrated CONUS express infrastructure. Express carrier's distribution structure will be used to pick-up/deliver cargo to/from their hubs where the carrier's personnel will load, off-load, and service AMC airlift missions. AMC will provide daily round trip direct service between the express carriers CONUS hub(s) and the designated APOD(S) in the theater of operations. The theater commander will establish a distribution system that provides next day delivery of critical cargo.

Awaiting Part Time(AWP). Elapsed time a reparable spends awaiting parts while in the repair cycle.

Base Lean Level. Authorized stock for storage, includes AWP and AWM assets, and immediate use at the base level, as influenced by the base daily demand rate, base repair cycle time, percent of base repair, and order and ship time (OS&T) from the consolidated serviceable inventory. This level may fluctuate based upon use at the bases. Total quantities authorized may be fixed lower or higher based upon consumption.

Consolidated Serviceable Inventory(CSI). The centralized serviceable asset inventory, stored at the source of repair, which acts as a serviceable buffer to provide responsive and support in filling customer requirements.

Consolidated Serviceable Inventory(CSI) Level. The quantity of serviceable inventory maintained at the source of repair necessary to accommodate all of the user requirements. This level will fluctuate based upon changes in customer consumption and the responsiveness of the Lean Logistics support system.

Customs Electronic Data Interchange (EDI). An initiative to eliminate the manual, labor-intensive military clearance procedures with an efficient, all electronic system where customs information is passed electronically from military shipping activities to overseas customs clearance offices. Cargo is pre-cleared by host nation customs before it physically reaches the country and is expedited to the customer.

Distribution and Repair in a Variable Environment (DRIVE). A mathematical model used by the source of supply/repair to prioritize repair and distribution of assets to the users from the source of repair or the consolidated serviceable inventory. Considers

base flying activity, asset position and aircraft availability goals as established by the Air Staff. MAJCOM provides flying hours and other command related up-to-date data to maintain priority sequences.

Door-To-Door Distribution (D3). The Air Force replaced LOGAIR by moving high-priority cargo via commercial express overnight service. D3 service involves commercial express carrier pick-up of cargo at the designated points on base, and time-definite delivery of the cargo to a designated receiving location (another base, depot; CONUS and OCONUS) while maintaining complete intransit visibility. D3 can further increase shipment velocity if cargo is moved directly from the point of issue to point of receipt (i.e., base to depot or depot to base). D3 is most effective when base-level handling nodes are eliminated and unserviceable parts move directly from the customer (maintenance) to the source of repair; and returning serviceable parts are delivered directly to the customer. Handling and waiting time is reduced by by-passing traditional supply and transportation modes and nodes.

Express Table. A file in the Stock Control and Distribution System(SC&D, D035) that identifies items to be issued to maintenance upon receipt in Central Receiving.

Express Transportation. Express Transportation leverages the relatively low cost and high reliability of fast transportation against the high cost of maintaining large inventories of spare parts. Express transportation will be used to speed the shipment and return of Lean Logistics items.

In-Place Readiness Spares (IRSP). (Replaces BLSS) Spares and repair parts of RSP intended for use as base support for units that plan to operate in place during wartime using the remove and repair, and replace (RRR) concept.

Ineligible Stock. Assets above the authorized lean levels or those contained in the CSI. These assets, for the purposes of the demonstration, will be considered stock not usable either by the bases or the PDM line unless a MICAP situation exists. These stocks are considered excess to the demonstration requirement based upon new OS&T and depot repair times. At the depots, the item managers will place the serviceable assets in ownership purpose code B, and unserviceable in condition code J. The bases will also be required to identify stock at the base as excess when the total number available exceeds the authorized lean quantity.

Mobility Readiness Spares Packages. (MRSP) (Replaces MSK) An air transportable package of spares and repair parts required to sustain planned wartime or contingency operations of a weapon or support system for a specified period of time pending resupply.

Order and Ship Time. (O&ST) Represents the expected number of days between initiation of a requisition and receipt of the stock by the user.

Repair and Return Packaging (R2P). R2P has three components: First, take maximum advantage of door-to-door distribution and express transportation. Second, shipments authorized under R2P are centrally (DBOF) funded--no cost to base transportation accounts. Third, it implements a best business practice of return package labeling adapted from the commercial mail order catalog industry. A return label is placed in the box of a serviceable item before it is shipped from the depot. Upon receipt of a serviceable item, the unserviceable part is placed in the same reusable container, the pre-addressed express carrier shipping label from within the

box is attached, and the item is shipped directly from the flightline to the source of repair. The R2P process was created to expedite base-level handling nodes, move parts into the transportation system quickly, and reduce improve the return of unserviceable items to the source of repair as soon as possible.

Reparable Item Movement Control System Code (RIMCS). A code that directs the disposition of unserviceable materiel to repair, storage, or disposal.

Retrograde Reparable carcasses returning to the depot from operating locations.

Rapid Theater Distribution System (RTDS). A theater-established rapid intra-theater distribution system to lash-up with AMX. Theater assets (C- 12, Helicopter, COD, panel van) await the arrival of AMX at the theater distribution hub (similar to the CONUS hub) and after a fast sort cargo is delivered direct to forward units.

Glossary

A/C	Aircraft
ACC	Air Combat Command
AETC	Air Education and Training Command
AF	Air Force
AFB	AF Base
AFCA	AF Command Control Communications & Computer Agency
AFCSSO	Air Force Contingency Supply Support Office
AFIT	Air Force Institute of Technology
AFLC	Air Force Logistics Command
AFLIF	Air Force Logistics Information File
AFLMA	Air Force Logistics Management Agency
AFMC	Air Force Materiel Command
AFSEB	Air Force Supply Executive Board
AFSWPWG	Air Force Supply Wartime Policy Work Group
ALC	Air Logistics Center
AMC	Air Mobility Command
AMX	Air Mobility Express
ANG	Air National Guard
AOR	Area of Responsibility
API	Application Part Indenture
APOD	Aerial Port of Debarkation
APOE	Aerial Port of Embarkation
ATAC-AF	Advanced Traceability and Control for Air Force
ATCALS	Air Traffic Control and Landing System
ATLIS	Avionics Two-Level Integration System
AWM	Awaiting Maintenance
AWP	Awaiting Parts
BLSM	Base Level System Modernization
BLSS	Base Level Supply Stock
BOA	Board of Advisors
C-E	Communication-Electronics
CAMS	Core Automated Maintenance System
CANN rate	Cannibalization rate
CIM	Corporate Information Management
CINC	Commander in Chief

CLCC	Command Logistics Control Center
CMOs	Cargo Movement Operating System
CND/BCS	Cannot Duplicate/Bench Check Serviceable
CONOPs	Concept of Operations
CONUS	Continental United States
COPAR	Commercial Parts Store
CPFH	Cost Per Flying Hour
CRAF	Civil Reserve Air Fleet
CSI	Consolidated Serviceable Inventory
CSMS	Combat Supplies Management System
CTO	Commercial Transportation Office
D3	Door-to-Door Distribution
DAAS	Defense Automated Addressing System
DIFM	Due In From Maintenance
DLA	Defense Logistics Agency
DLR	Depot Level Repairable
DMIF	Defense National Industrial Fund
DMMIS	Depot Maintenance Management Information System
DOD	Department of Defense
DRIVE	Distribution and Repair in a Variable Environment
DSS	Distribution Standard System
EDI	Electronic Data Interchange
EOQDL	Economic Order Quantity Demand Level
EPS	Exchangeable Production System
ERCC	Engine Regional Repair Center
FAA	Federal Aviation Administration
FMS	Foreign Military Sales
FOA	Forward Operating Agency
FY	Fiscal Year
GR-GP	Global Reach-Global Power
GTN	Global Transportation Network
IIP	Industry Information Processor
ICS	Interim Contractor Support
IDEF	Integrated Definition
IMDS	Integrated Maintenance Data System
IRSP	In-Place Readiness Spares
ITS	Inventory Tracking System
ITV	Intransit Visibility
IWSM	Integrated Weapon System Management

JCN	Job Control Number
L2C2	Lean Logistics Command and Control
LASER	Logistics: A Support Environment Re-engineered
LRU	Line Replaceable Unit
M3	Mail-like Matter Movement
MAJCOM	Major Command
MHE	Material Handling Equipment
MICAP	Mission Capable Part Missing From Aircraft
MISTR	Management of Items Subject to Repair
MRC	Major Regional Conflict
MRSP	Mobility Readiness Spares Packages
MTMC	Military Traffic Management Command
MTS	Material Tracking System
NASA	National Aeronautics and Space Administration
NMCS	Not Mission Capable Supply
NOP	Non-optimized
NRTS	Not Repairable This Station
NSN	National Stock Number
OC-ALC	Oklahoma City Air Logistics Center
OJT	On the Job Training
OO-ALC	Ogden Air Logistics Center
OPR	Office of Primary Responsibility
OPTEMPO	Operational Tempo
ORA	Operational Readiness Assessment
O&ST	Order and Ship Time
PDM	Programmed Depot Maintenance
PICA	Primary Inventory Control Activity
PMEL	Precise Measurement Equipment Laboratory
PMR	Program Management Review
POL	Petroleum Oil and Lubricants
PQDR	Product Quality Deficiency Report
R&M	Reliability and Maintainability
R2	Repair and Return Packaging
RDS	Rapid Distribution System
REMIS	Reliability and Maintainability Information System -
RIMCS	Reparable Item Movement Control System
RMI	Raw Materials Inventory
RRR	Remove, Repair and Replace
RSD	Reparable Support Division

RSP	Readiness Spares Package
RTDS	Rapid Theater Distribution System
RTOK	Retest Kit
SA-ALC	San Antonio Air Logistics Center
SBSS	Standard Business Supply System
SC&D	Stock Control and Distribution System
SCS	Stock Control System
SEMR	Sustainability Executive Management Review
SICA	Secondary Inventory Control Activity
SM-ALC	Sacramento Air Logistics Center
SOR	Source of Repair
SOSS	Supply Ordering and Sourcing System
SQL	Systems Query Language
SRU	Shop Replaceable Unit
TAV	Total Asset Visibility
TCN	Transportation Control Number
TICARRS	Tactical Interim CAMS and REMIS Reporting System
TMO	Transportation Management Office
TOC	Theory of Constraints
U.S.	United States
UMMIPS	Uniform Materiel Movement and Issue Priority System
USAF	United States Air Force
WR-AILC	Warner Robins Air Logistics Center
WRSK	War Reserve Spares Kit (new RSP)
WSMIS	Weapon System Management Information System
2LM	Two Level Maintenance

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