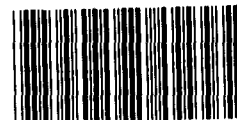


September 1990

MILITARY BASES

Information on Air Logistics Centers



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**National Security and
International Affairs Division**

B-240995

September 10, 1990

The Honorable Vic Fazio
House of Representatives

As you requested, we obtained selected data on the performance and capacity for depot maintenance operations at the five Air Force Air Logistics Centers (ALC). The five ALCs are Ogden ALC, Hill Air Force Base, Utah; Oklahoma City ALC, Tinker Air Force Base, Oklahoma; Sacramento ALC, McClellan Air Force Base, California; San Antonio ALC, Kelly Air Force Base, Texas; and Warner Robins ALC, Robins Air Force Base, Georgia.

Results in Brief

Each ALC is assigned responsibility for maintaining, modifying, and repairing specific types of aircraft, engines, and reparable parts. The ALCs have different missions and facilities and consequently cross comparisons between them are of limited value, according to Air Force officials.

Some indicators of performance are the number of aircraft on which maintenance is completed, the number of engines and other items repaired, and labor hours expended annually on depot maintenance. For example, in fiscal year 1989, the number of aircraft on which maintenance was completed ranged from 62 at the San Antonio ALC to 291 at the Ogden ALC; however, the type of aircraft were different, and the nature and extent of maintenance performed may have varied. Only two ALCs repair aircraft engines. In fiscal year 1989, 5,029 engines were repaired at the San Antonio ALC and 1,372 were repaired at the Oklahoma City ALC.

Some indicators of capacity are the size of maintenance facilities and the depot maintenance work force. For example, the square footage of facilities, such as hangars, machine shops, and test facilities, ranged from 2.7 million at the Warner Robins ALC to 3.9 million at the San Antonio ALC. The work years expended on depot maintenance ranged from about 6,000 at the Sacramento ALC to about 8,000 at the Oklahoma City ALC.

The Department of Defense is currently evaluating depot maintenance operations to determine how best to lower the overall cost while retaining essential operating capability. The Secretaries of the military services are scheduled to submit their coordinated long-range plan to the Assistant Secretary of Defense for Production and Logistics by October

1, 1990. One option being considered is to increase the work performed by one military service for another. The Air Force is considering the possibility of reducing or perhaps removing all depot maintenance activity from one ALC. Air Force Logistics Command officials told us that performance is not a major factor in their analysis of options to reduce or possibly remove aircraft maintenance work from one ALC.

Scope and Methodology

The data contained in this fact sheet were obtained at the Air Force Logistics Command in Dayton, Ohio. We did not verify or analyze the data or question the methodology used to compile it. Because of our limited objective, we did not determine the reasons for, or the significance of, changes or trends in data. Based on discussions with Air Force Logistics Command officials and our review of documentation, we judgmentally selected which indicators of performance and capacity on which to collect data. We conducted our work during August 1990.

Because of the short time available to complete our work, we did not obtain written agency comments on this fact sheet. However, Office of the Secretary of Defense and Air Force officials did review our draft and cautioned us about comparing ALCs based on performance data. Air Force Logistics Command officials stated that they do not generally make direct comparisons because of the unique work loads, operations, and specialized facilities of each Center. For example, officials said it is difficult to compare the B-1B and F-16 aircraft on selected performance indicators because of inherent differences in systems, the types of maintenance problems encountered, and the years of available maintenance experience. These officials noted that while comparing a Center's actual performance against its plan is an appropriate management tool for the Center Commander, it may not be meaningful to compare centers that maintain different systems.

Appendix I provides data on indicators of production, productivity, quality, resources and capacity, and financial information. Appendix II briefly describes the depot maintenance missions assigned to the five ALCs. Appendix III lists the major contributors to this fact sheet.

Unless you publicly announce its contents earlier, we plan no further distribution of this fact sheet until 30 days from its issue date. At that time we will send copies to the Chairmen of the House and Senate Armed Service Committees and other interested parties.

Please contact me at (202) 275-8412 if you or your staff have any questions concerning this fact sheet.

Sincerely yours,

A handwritten signature in cursive script that reads "Donna Heivilin".

Donna M. Heivilin
Director, Logistics Issues

Contents

Letter		1
Appendix I		6
Depot Maintenance	Production	6
Data for Air Force Air	Productivity	7
Logistics Centers	Quality	8
	Resources and Capacity	8
	Financial Information	10
Appendix II		11
Depot Maintenance		
Missions Assigned to		
the Air Logistics		
Centers		
Appendix III		12
Major Contributors to		
This Fact Sheet		
Tables		
	Table I.1: Aircraft Work Completed	6
	Table I.2: Repairable Work Completed	6
	Table I.3: Engine Work Completed	7
	Table I.4: Direct Production Hours	7
	Table I.5: Percent of Aircraft Maintenance Completed on Time	7
	Table I.6: Average Daily Hours of Direct Labor Per Maintenance Employee	8
	Table I.7: Estimated Productivity Savings	8
	Table I.8: Customer Quality Complaint Rates	8
	Table I.9: Maintenance Facilities	9
	Table I.10: Maintenance Equipment	9
	Table I.11 Fiscal Year 1989 Depot Maintenance Work Force	9
	Table I.12: Fiscal Year 1989 Financial Operating Results	10

Contents

Abbreviations

ALC Air Logistics Center
TRC Technology Repair Center

Depot Maintenance Data for Air Force Air Logistics Centers

This appendix presents selected performance and capacity data on depot maintenance operations at the five ALCs. The data show the maintenance work accomplished by ALC personnel. Data does not include work accomplished by contractors and through interservice agreements. Air Force officials cautioned against making direct comparisons among the ALCs on individual performance indicators because of differences in work loads and specialized operations assigned to each ALC.

Production

Table I.1 shows the number of aircraft on which maintenance work was completed. Maintenance work includes programmed depot maintenance, inspections, and modifications.

Table I.1: Aircraft Work Completed

Air Logistics Center	Fiscal year				
	1985	1986	1987	1988	1989
Ogden	445	492	340	256	291
Oklahoma City	173	215	191	148	126
Sacramento	295	264	243	224	222
San Antonio	67	71	81	64	62
Warner Robins	296	207	158	125	189

Table I.2 shows the number of reparable items on which work was completed. Repairable items are subsystems and components of weapon systems and equipment, such as avionics, life support equipment, and flight control instruments. The Air Force also refers to reparable items as exchangeables.

Table I.2: Repairable Work Completed

Air Logistics Center	Fiscal year				
	1985	1986	1987	1988	1989
Items in thousands					
Ogden	152	160	165	128	119
Oklahoma City	287	291	276	212	195
Sacramento	201	193	184	150	155
San Antonio	186	230	257	167	133
Warner Robins	230	219	206	158	159

Table I.3 shows the number of engines repaired by ALC. Only Oklahoma City and San Antonio ALCs repair aircraft engines.

**Appendix I
Depot Maintenance Data for Air Force Air
Logistics Centers**

Table I.3: Engine Work Completed

Air Logistics Center	Fiscal year				
	1985	1986	1987	1988	1989
Oklahoma City	1,271	1,573	1,250	1,093	1,372
San Antonio ^a	7,031	7,034	6,697	5,575	5,029

^aSan Antonio engine work load includes engine modules and gas turbine engines.

Table I.4 shows the actual hours of direct labor expended annually on depot maintenance.

Table I.4: Direct Production Hours

Labor hours in thousands					
Air Logistics Center	Fiscal year				
	1985	1986	1987	1988	1989
Ogden	8,512	8,888	8,370	7,412	7,980
Oklahoma City	9,780	10,560	10,361	8,873	8,657
Sacramento	7,578	7,905	7,686	6,771	6,710
San Antonio	9,281	9,637	9,566	8,542	9,107
Warner Robins	7,693	7,914	7,752	7,037	7,837

Productivity

Table I.5 shows the extent to which each ALC completed scheduled maintenance on time. It compares the number of aircraft completed on schedule to the total number worked on. We were unable to readily obtain data for fiscal years 1985 and 1986.

Table I.5: Percent of Aircraft Maintenance Completed on Time

Air Logistics Center	Fiscal year		
	1987	1988	1989
Ogden	100	100	99
Oklahoma City	100	97	99
Sacramento	95	96	100
San Antonio	82	40	35
Warner Robins	88	34	46

Table I.6 provides a measure of labor productivity in terms of daily hours of output per maintenance employee, including mechanics, managers, and support staff. Hours of output are based on an estimate of direct labor hours needed to complete maintenance tasks.

**Appendix I
Depot Maintenance Data for Air Force Air
Logistics Centers**

Table I.6: Average Daily Hours of Direct Labor Per Maintenance Employee

Air Logistics Center	Fiscal year				
	1985	1986	1987	1988	1989
Ogden	3.91	4.00	3.96	3.86	3.79
Oklahoma City	3.48	3.60	3.94	3.84	3.78
Sacramento	4.12	4.08	4.11	3.84	3.92
San Antonio	3.87	4.13	4.20	3.87	3.96
Warner Robins	3.92	4.00	4.05	3.90	3.94

Table I.7 shows the ALC-reported productivity savings resulting from a number of programs, including employee quality teams, work methods improvements, and capital investments to incorporate new technologies.

Table I.7: Estimated Productivity Savings

Dollars in millions

Air Logistics Center	Fiscal year				
	1985	1986	1987	1988	1989
Ogden	\$33	\$35	\$42	\$52	\$80
Oklahoma City	33	37	40	13	21
Sacramento	21	39	47	29	49
San Antonio	141	66	117	162	144
Warner Robins	33	58	55	69	66

Quality

Table I.8 shows the number of reparables reported defective by the customer (user) expressed as a percent of total units repaired during the fiscal year.

Table I.8: Customer Quality Complaint Rates

Air Logistics Center	Fiscal year			
	1986	1987	1988	1989
Ogden	1.72	1.66	1.65	1.66
Oklahoma City	.81	.72	.84	.88
Sacramento	1.46	1.60	1.44	1.31
San Antonio	.50	.44	.61	.59
Warner Robins	2.11	1.97	2.30	2.16

Resources and Capacity

Table I.9 shows the value and size of maintenance facilities, which include hangars, machine shops, and test facilities. Cost figures are estimated replacement costs.

**Appendix I
Depot Maintenance Data for Air Force Air
Logistics Centers**

Table I.9: Maintenance Facilities

Dollars in millions			
Air Logistics Center	Buildings/area (Square feet in millions)	Average age of facilities (Years)	Replacement cost
Ogden	302/3.6	34	\$316
Oklahoma City	45/3.3	33	806
Sacramento	128/3.8	28	634
San Antonio	65/3.9	34	400
Warner Robins	68/2.7	28	207

Table I.10 shows the average age and estimated replacement cost of the industrial plant equipment used in maintenance. Equipment includes such machinery as spot welders, drilling machines, lathes, grinders, and special test equipment.

Table I.10: Maintenance Equipment

Dollars in millions		
Air Logistics Center	Average age of equipment (Years)	Replacement cost
Ogden	11	\$585
Oklahoma City	16	477
Sacramento	13	435
San Antonio	11	460
Warner Robins	11	545

Table I.11 shows the total number of workyears expended on depot maintenance during fiscal year 1989. The work force includes mechanics, machinists, welders, and electricians as well as managers and administrative staff.

**Table I.11 Fiscal Year 1989 Depot
Maintenance Work Force**

Air Logistics Center	Civilian	Military	Total
Ogden	6,696	177	6,873
Oklahoma City	8,085	115	8,200
Sacramento	6,183	93	6,276
San Antonio	8,022	61	8,083
Warner Robins	6,605	66	6,671

**Appendix I
 Depot Maintenance Data for Air Force Air
 Logistics Centers**

Financial Information

Table I.12 shows total revenues from depot maintenance performed by ALC personnel and related expenses for each Center. Operating result (gain or loss) is a reflection of how closely an ALC met its financial plan.

**Table I.12: Fiscal Year 1989 Financial
 Operating Results**

Dollars in millions			
Air Logistics Center	Revenues	Expenses	Net operating result
Ogden	\$349	\$368	(\$19)
Oklahoma City	530	577	(47)
Sacramento	367	377	(10)
San Antonio	478	530	(52)
Warner Robins	395	436	(41)

Note: Numbers in parentheses indicate operating deficit.

Depot Maintenance Missions Assigned to the Air Logistics Centers

Ogden ALC, Hill Air Force Base, Utah

The Ogden ALC repairs and modifies the F-4, F-16, and C-130 aircraft (a recent addition). The Center also maintains Air Force missile systems and components, including the Peacekeeper, Minuteman, Maverick, and Sidewinder. Ogden is the technology repair center¹ (TRC) for weapons, air munitions, landing gears, reconnaissance/photographic equipment, and training and simulation equipment.

Oklahoma City ALC, Tinker Air Force Base, Oklahoma

Oklahoma City ALC is the source of repair for the B-1B, B-52, C-135, and E-3 aircraft. The Center has also been assigned repair responsibility for the B-2 Stealth bomber. It is also one of the two Centers (San Antonio is the other) that repairs and overhauls jet engines. Oklahoma City is the TRC for automatic flight controls, airframe and engine-related components, engine instruments, and oxygen components.

Sacramento ALC, McClellan Air Force Base, California

Sacramento ALC is the designated source of repair for the F-111, A-7, and A-10 aircraft. The Center recently began F-15 modification work and has been assigned repair responsibility for the Advanced Tactical Fighter. Sacramento is the TRC for electrical components, flight control instruments, tactical shelters, and ground communications-electronics equipment.

San Antonio ALC, Kelly Air Force Base, Texas

The San Antonio ALC maintains and repairs the B-52 and C-5 aircraft. The Center has been designated the source of repair for the C-17 aircraft. The Center also repairs and overhauls a large number of engines and engine modules. The Center is the TRC for electronic aerospace ground equipment, electro-mechanical support equipment, nuclear components, and automatic test equipment.

Warner Robins ALC, Robins Air Force Base, Georgia

Warner Robins ALC repairs and modifies the F-15, C-141, and C-130 aircraft. The Center is the TRC for life support systems, propellers, and airborne electronics. The airborne electronics work load includes more than 300 avionics systems and almost 10,000 parts and components.

¹Under the technology repair center concept, selected homogeneous maintenance work loads are assigned to a single center rather than maintaining capabilities at multiple locations.

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