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A COMPARISON OF THE MILITARY'S ORGANIC MOVEMENT AND COMMERCIAL EXPRESS CARRIERS

THESIS

Travis E. Condon
Captain, USAF

Kirk A. Patterson
Captain, USAF

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THESIS

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Travis, E. Condon, M.S.
Captain, USAF

Kirk A. Patterson, M.S.
Captain, USAF

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The foolishness of God is wiser than men. 1 Cor 1:25

The simplest truths are the greatest, and so are the greatest men. - J.C. and A.W. Hare

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Travis E. Condon Kirk A. Patterson

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Abstract

The DoD has begun outsourcing airlift in order to expedite high priority cargo movement. However, are commercial express carriers more expedient in the cargo delivery than the Air Force organic transportation system? Although anecdotal evidence suggests commercial carriers are faster, little empirical research has been conducted on this subject.

This study compares the military's organic transportation system with Federal Express in the delivery of high priority cargo to Spangdahlem Air Base, Germany. The Large Sample Test of Hypothesis was used to determine if there was a significant difference between the cargo transit times of the two.

The mean delivery time for the military's organic transportation system from CONUS to Spangdahlem was 6.24 days, while Federal Express' mean delivery time was 2.71 days.

The primary conclusion drawn from this research is that Federal Express is indeed able to transport small items (weighing less than 150 pounds) to Spangdahlem AB, Germany faster than the military's traditional organic transportation system. A secondary conclusion taken from this research is that every segment of the pipeline except the actual flight time between CONUS and Europe all take significantly longer for the military system than for the commercial system.

A COMPARISON OF THE MILITARY'S ORGANIC MOVEMENT AND COMMERCIAL EXPRESS CARRIERS

I. Introduction

Military Logistics Philosophy

The Department of Defense (DoD) logistics system, designed decades ago to support a global conflict with the Soviet Union and Warsaw Pact nations, is a slow, complex, and costly enterprise. It has been estimated to cost the American taxpayers approximately $40 billion annually (Crock, 1995:98). This logistics arrangement, termed *mass logistics paradigm* by Girardini et. al, utilized three mechanisms for providing logistics support: 1) *functional bureaucracies*, 2) *large inventories*, and 3) *special management actions* (Girardini and others, 1995:18). With the end of the Cold War, the drawdown in military personnel, declining military budgets, and the emphasis on responding to two major regional contingencies, DoD's logistics system must now support a smaller, highly mobile, high-technology force with more flexible and responsive processes at a lower total cost. In response, the 1996 edition of the DoD Logistics Strategic Plan included the need for a restructured logistics system and stated two desired outcomes of restructuring logistics: "better, faster, and more reliable, and

highly mobile response capability and a leaner infrastructure that better balances public/private capabilities" (Logistics Strategic Plan, 1996:15).

Air Force Lean Logistics

The Air Force logistics community has taken numerous steps to achieve a more flexible and responsive logistics system and has grouped them under the term "Lean Logistics" and more recently "Smart Logistics" (Viccellio, 1996). Lean Logistics is an Air Force program that seeks to improve operational capability by adopting state-of-the-art business practices for all logistics processes. The objective of Lean Logistics is to "maximize operational capability by using high velocity, just-in-time processes to manage mission and logistics uncertainty in-lieu of large inventory levels--resulting in shorter cycle times, reduced inventories and cost, and smaller mobility footprint" (Lean Logistics Master Plan v4.0, 1996:2).

Much of the focus on Lean logistics has been in reducing the reparable/serviceable pipeline. A recent GAO study reports the Air Force has approximately $33 billion in reparable inventory (GAO, 1996:29). A 1990 Air Force Logistics Command analysis suggests that a one-day reduction in the pipeline could reduce inventory costs by $16 to $25 million annually (Hill, Rexroad, and Moulder, 1990:20).

Logistics Pipeline

Integral to all successful military operations is the establishment of a logistics pipeline. Air Force Doctrine Document 40 states:

> Successful sustainment of forces requires a logistics pipeline to link a weapon system with its associated resources. This link makes it possible to sustain weapon systems with the resources needed for continuous operation as well as for retrograde movement. (Logistics, 1994:8)

A logistics pipeline is composed of many steps depending on the type of material being requisitioned, its source, and its destination. For high priority aircraft replacement parts, most originate from depots or other Air Force bases and are airlifted via organic military airlift or commercial airlift to the destination. Several organizations may get involved depending on the route of the material. The originating and terminating Traffic Management Offices, supporting ground transportation, and AMC aerial port organizations may contribute to the movement of the requisitioned item. If commercial airlift is used, the item may move from the source to the destination without any military organization involvement. A combination of these two modes is possible as well.

Prioritization

The Air Force currently utilizes the Uniform Materiel Movement and Issue Priority System (UMMIPS) as the established priority for order and ship pipeline time from the depot to base level organizations. Department of Defense Materiel Management Regulation, DoD 4140.1-R describes the UMMIPS process. The UMMIPS establishes these time standards in calendar days for each segment of the pipeline. Priority designators are determined from the Force/Activity Designator (FAD) code assigned to the requesting unit (Tables 1 and 2) and the Urgency of Need Designator (UND) specified by the requester (Table 3). Priority designators are consolidated into priority groups (Table 4) and time standards are given for each priority group in each segment of the pipeline (Table 5).

The UMMIPS first establishes prioritization on the priority group and then on the age of the requisitions within each group. The oldest requisition within the highest priority group has priority.

Table 1 - Force Activity Designator (FAD) Assignment Authority

PRECEDENCE RATING	FORCE ACTIVITY DESIGNATOR CODE	ASSIGNMENT AUTHORITY
1-1 THRU 1-20	I*	JCS
2-1 THRU 7-20	II	HQ USAF
8-1 THRU 13-20	III	HQ USAF
14-1 THRU 19-20	IV	HQ USAF
20-1 THRU 25-20	V	HQ USAF

Table 2 - Force/Activity Designator (FAD) Codes

I	II	III	IV	V
COMBAT	COMBAT	DEPLOY	ACTIVE &	OTHER
	READINESS	READINESS	RESERVE	

Table 3 - Urgency of Need Designators (UND)

A	B	C
CANNOT	MISSION	FIRM
PERFORM	CAPABILITY	RQMT & STOCK
MISSION	IMPAIRED	REPLENISHMENT

Table 4 - UMMIPS Priority Matrix

FAD	A	B	C
I	1	4	11
II	2	5	12
III	3	6	13
IV	7	9	14
V	8	10	15
	←PRIORITY→		

Priority Groups	
Priorities 1 - 3	Group 1
Priorities 4 - 8	Group 2
Priorities 9 - 15	Group 3

Table 5 - UMMIPS Time Standards in Calendar Days
(Adapted from DoD 4140.1-R, DoD Materiel Management Regulation, 1993)

		TP-1					TP-2					TP-3				
Priority Designator Edit Requirements		(PD 01-08)					(PD 01-08) (PD 01-15 for 444)					(PD 01-15)				
PIPELINE SEGMENT (Note 1)		**RDD OF 999,N__, E__**					**RDD OF 444,555,777**					**Blank RDD**				
A. Requisition Submission		1					1					2				
B. Passing Action		0.5					1					1				
C. ICP Availability Determination		1					1					1				(Note 3)
D. Depot Storage Site and/or Base Processing and Packaging		1					1					5				
E. Transportation Hold and CONUS Intransit		1					4					10				(Note 4)
Area (Note 2)	CONUS	1	2	3	4	CONUS	1	2	3	4	CONUS	1	2	3	4	
F. POE and/or CCP processing and intransit to carrier	N/A	1	1	1	3	N/A	1	1	1	3	N/A	10	10	10	21	(Note 4)
G. Intransit Overseas	N/A	1	1	2	3	N/A	1	1	2	3	N/A	10	15	25	30	
H. POD Processing	N/A	1	1	1	1	N/A	1	1	1	2	N/A	3	3	3	5	
I. Intra-theater Intransit	N/A	1	1	1	1	N/A	1	1	1	1	N/A	5	5	5	5	
J. Receipt take-up by Requisitioner	.5	.5	.5	.5	.5	1	1	1	1	1	3	3	3	3	3	
K. Total Order and Ship Time	5	9	9	10	13	9	13	13	14	18	22	50	55	65	83	

NOTES:

Required Delivery Date (RDD):

- -- 999 Indicates expedited handling requirements for non mission capable supply (NMCS) overseas or CONUS customers deploying overseas within 30 days
- -- N__ Indicates expedited handling due to NMCS requirement CONUS customer
- -- E__ Indicates expedited handling due to anticipated NMCS requirement CONUS customer
- -- 555 Indicates exception to mass requisition cancellation, expedited handling required
- -- 777 Indicates expedited handling required for other than the above reasons
- -- 444 Indicates handling service for customers collocated with the storage activity or for locally negotiated arrangements
- -- Specific date indicates handling to meet that date of delivery
- -- Blank RDD indicates routine handling

(1) Pipeline standards for materiel delivered exclude weekends and holidays except for segments D and E for requirements with RDDs 999, N__, or E___. Storage activity and transportation managers may combine the times for segments D and E as long as the combined time is not exceeded. The pipeline time standards are service level targets; they shall be met or improved upon whenever physically and economically feasible.

(2) Areas:

1. To Alaska (Elmendorf only), Hawaii, N. Atlantic, Caribbean, or Central America
2. To U.K. and Northern Europe
3. To Japan (Yakota only), Okinawa, Korea (Osan only), Philippines, Guam and Western Mediterranean
4. Hard lift areas and all other destinations not included in 1-3 (e.g. S. America, Eastern Mediterranean, Africa, Diego Garcia, etc) as determined by USTRANSCOM

(3) For manually submitted requisitions or requisitions requiring manual review, 1 day for PDs 01-08 and 3 days for PDs 09-15.

(4) Combine segments E and F as a single segment when a SEAVAN is loaded at source or when cargo is moved breakbulk to POD.

(5) Measurement of intra/inter-service lateral support or redistribution begins at C or D installation level).

DoD organizations, as in the commercial sector, have several options when deciding on the most appropriate mode of transportation to meet the UMMIPS time standards, maintain mission readiness, and limit logistics costs. Military organizations located overseas have relied on Air Mobility Command to move priority cargo in the past. However, with the global expansion of express commercial airlift services, they may begin to utilize this resource.

Air Mobility Command (AMC) vs. Commercial Airlift

There exists a big difference between AMC airlift and commercial airlift. AMC airlift is centered around channel service. "A channel is a regularly scheduled mission over a fixed route with capacity available to all customers" (Air Mobility Master Plan, 1997:2-12). A monthly schedule is published for both passenger and cargo channel missions. A priority system is used to allocate airlift resources because demand exceeds AMC capabilities.

Express commercial carriers (i.e. FedEx, UPS), on the other hand, are more responsive to customer demands and are able to adjust flight schedules and airlift capabilities on a daily basis if necessary. According to Bill Endres, Program Management Advisor for Federal Express, Federal Express is able to fly an additional aircraft with only a few hours notice, if necessary to ensure the on time arrival of cargo. Thus, commercial express carriers have structured their business practices to ensure speedy, reliable, and flexible delivery.

The capabilities of the express commercial carriers have led to some observers to suggest that airlift of high priority cargo might be outsourced to the private sector. They

claim this strategy might reduce the logistics pipeline and lead to lower inventories and lower overall logistics costs. Normally, the organic transportation system is referred to as the Defense Transportation System (DTS). Air Force Policy Directive 24-2, Preparation and Movement of Air Force Materiel, defines the DTS as:

> an integrated system associated with the movement of Department of Defense (DoD) owned or controlled materiel. It is comprised of DoD personnel, facilities, equipment, documents, systems, and those commercial applications and resources operating under the control or visibility of DoD.

Given this definition of the DTS includes commercial carriers and the objective to solely evaluate the organic transportation efficiency, the DTS will not be compared to Federal Express, but the comparison will be organic movements, excluding commercial air, to Federal Express pipeline times. No commercial carrier data was included in the organic analysis of the transportation pipeline.

Outsourcing

The push to outsource, or have the private sector perform certain tasks instead of the government using in-house personnel or resources, is not new to the U.S. Government or the DoD. During World War II, the Department of War (now DoD) took over certain capabilities that had previously been performed by the private sector. The Navy Sea-Bees is one example (Bejtlich and Hickman, 1996:11). The first Office of Management and Budget Circular A-76 was published in 1955 which supported privatization efforts. Outsourcing gained momentum during the Reagan administration as a way to reduce the size of government, cut costs, and increase efficiency as declining defense budgets after

the Vietnam War forced officials to examine alternatives to reduce costs (Brandt, 1996:3).

Converting jobs currently performed by government employees to hiring the private sector to accomplish certain tasks has been shown to save money. One GAO report in 1994 found that a civilian employee costs about $15,000 less per year than a military person of a comparable grade (GAO, 1994:4). The DoD calculates a savings of approximately $9,600 per position (Thompson, 1995). The Army has on occasion cut costs by 30% after initiating outsourcing actions (POM FY 98-03:1). A Pentagon study of 235 initiatives between 1980 and 1982 indicate that contracting out services saved approximately 22% (Perritt, 1990:58).

There have been several examples of successful outsourcing initiatives in the recent past. For example, flight line maintenance of trainer aircraft has been privatized at Vance Air Force Base since 1960. Privatization has saved approximately 27% compared to other pilot training bases (DoD Congressional Report, 1989:43). Another example of successful outsourcing of noncombatant support operations is the contract the Army has established with the Brown and Root Services Corporation to run base camps, cook food, wash uniforms and entertain soldiers. Brown and Root has successfully worked in Somalia, Zaire, Italy, Saudi Arabia, and Bosnia. Army surveys from soldiers in Haiti indicate the soldiers were very pleased with the services provided by Brown and Root (Mathews, 1996:19).

Though there have been numerous examples of successful integration of the private sector into the DoD, there have also been numerous problems. One prime example was the attempt to privatize aircraft maintenance at Columbus AFB. Before

privatization, aircraft readiness rates were at 80%. One year later and after privatization, readiness rates stood at 33% (101st Cong., 1989:57). The Navy has also experienced problems with outsourcing in the U.S. Naval Air Force, Pacific Fleet (COMNAVAIRPAC). This command has experienced cost growth problems, lack of contract authority and control of resources, and reduced flexibility (Snyder, 1995:32-37).

Overview

In March, 1994 18 F-15C/D aircraft were transferred from Bitburg Air Base (AB), Germany to the 52nd Fighter Wing at Spangdahlem AB, Germany. During the transfer, Spangdahlem received and loaded the Mission Change Data (MCD) to support the 18 aircraft. Just prior to the transfer (February, 1994), Bitburg maintenance personnel filled the benchstock supplies for these aircraft to 200% to handle the initial parts requirements after relocating to Spangdahlem. This excessive benchstock allowed maintenance personnel to maintain a satisfactory Mission Capable Rate through 1994. In December, 1994, Spangdahlem met the Air Force standard of Total Not Mission Capable Supply (TNMCS) rate of 8 percent. However, as the benchstock began running out, TNMCS rates began rising and by December, 1995, the TNMCS rate for Spangdahlem had risen to 16.9 percent.

Numerous factors were found that contributed to the high TNMCS rates at Spangdahlem AB, including incomplete demand data at the time of the MCD, insufficient re-supply of expendable assets, high operations tempo, and heavy deployment taskings (McGovern, 1995).

After numerous meetings, Process Action Teams, and correspondences, one of several suggestions to improve the TNMCS rate was to begin shipping all high priority cargo to Spangdahlem via express air carriers. As Major General Rondal H. Smith, Warner-Robins Air Logistics Center Commander, stated in his letter to the Defense Logistics Agency on 12 January, 1996, "every day we shave off Spangdahlem's ship time improves overall mission capability and reduces TNMCS rates." The Defense Logistics Agency agreed to test the idea by allowing all high priority cargo (IPG 01-02 with RDDS 999/MICAP/777 and RDD less than 21 days) to be shipped via commercial air carriers from 1 May, 1996 through 30 September, 1996.

Specific Problem

With fewer defense dollars, it is imperative the Air Force reduce overall logistics costs while maintaining appropriate levels of mission capability. The scope of this research will exclude discussion of transportation costs and focus only on delivery time (the time between when an order leaves the consignor and when it is received by the consignee). The decision to send high priority cargo on commercial carriers to Spangdahlem could lead to tremendous changes within the Air Force on how cargo is shipped throughout the world. With this in mind, the effectiveness of the commercial carriers must be compared with the Air Force transportation system to ensure transit times are reduced by utilizing commercial carriers.

Objectives

Two objectives will be addressed in this thesis in an effort to determine effects of the Defense Logistics Agency (DLA) test run. The first objective is to determine if

commercial express carriers are indeed able to transport cargo to Spangdahlem AB quicker than the traditional Air Force process. The second objective, if commercial carriers are faster, is to ascertain which portions of the Air Force transportation pipeline cause the delays when compared to the equivalent portions of the commercial carrier pipeline. The result of meeting these objectives will provide information that can be used when deciding if commercial carriers should be used to transport cargo to all Air Force bases around the world and which portions of the Air Force transportation system should be improved to make it more competitive with the commercial carriers

Research Scope

This research will be limited to analyzing the transit times of the various portions of the transportation pipeline between supply points in the U.S. and Spangdahlem AB, Germany for high priority cargo. Because the impetus of this study is the lengthy transit times of high priority cargo destined for Spangdahlem AB and not the expense of the transportation, costs will not be addressed in this study.

Data will be collected for the five months prior to the beginning of the test and for the five months of the test. Transit times for engines, hazardous cargo, and classified material will not be analyzed since these were not shipped via express carriers. This analysis focuses on the transit time of high priority cargo, as seen from the customer perspective, and not the cost of the transportation. Thus, costs will not be addressed in this study.

II. Data Collection

Introduction

This chapter focuses on the methodology used to collect the required data for analysis. Data were gathered from several sources including the Air Force Traceability and Cargo (ATAC) system and various Federal Express sources. Data from these sources were used to conduct the analysis.

Organic Data

The primary source of data collection for the organic data was from the official ATAC system. Due to the nature, scope and limitations of this study, the only data selected for analysis were high priority cargo destined for Spangdahlem Air Base, Germany.

In order to compare commercial transportation with organic transportation, data from the 5 month period prior to the activation of sole commercial service for high priority items were collected. The time period for organic data collection was 1 Dec 95 through 30 Apr 96.

Since the focus of the thesis is with high priority cargo destined for Spangdahlem Air Base, Germany, only cargo identified as 777 and 999 priority codes were used. (See Notes to Table 5 for priority code definitions.)

The ATAC system provided the following information for the organic portion of our data collection:

Table 6 - Organic Data Provided From ATAC System

1.	Document Identifier Codes (DICs)
	a. AS1 Record b. TX1 Record c. TXA/D Record d. TK7 Record e. TK1/2 Record f. TK6 Record g. D6S Record
2.	Document Number
3.	Consignor Department of Defense Activity Address Code (DoDAAC)
4.	Consignee DoDAAC
5.	Aerial Port of Embarkation (APOE)
6.	Aerial Port of Debarkation (APOD)

NOTE: The 6 categories listed in Table 6 are defined in Appendix D.

During the collection of organic data, it was found that DICs provide duplicate dates for receipt and shipment to and from the APOE. Items 1-3 below identify the different DICs that produce APOE receipt dates and items 4-6 below identify the different DICs that produce APOE ship dates.

1. TXA/D receipt at APOE
2. TK7 receipt at APOE
3. TK1/2 receipt at APOE
4. TK7 ship from APOE
5. TXA/D ship from APOE
6. TK1/2 ship from APOE

Multiple DICs for the same date (APOE receipt) prompted a call to Headquarters Air Mobility Command (HQ AMC). Per telecon with Capt Richard Moon, Cargo Channel Systems Director, the three documents serve three different purposes as already explained above. The TK7 provides trailer data, the TK1/2 provides advanced

notification, and the TXA/D record provides the actual receipt/shipment date. Per recommendation of Capt Richard Moon and for the purposes of analysis in this thesis, the TXA/D record will be used to determine the actual APOE receipt/shipment date for each document number (Moon, 1997).

Due to the limited scope of the study, certain types of material were excluded from the analysis. The types of material excluded were hazardous material, classified material, and aircraft engines because commercial carriers were not carrying this material for the time of the study.

After collecting the data, an Ada program was designed to put the organic data into a format that could be easily analyzed.

In the original form, each Document Number contained approximately 5-9 different lines for each DIC and many times, there were duplicate DICs. In the event of a duplicate DIC providing the same information, the DIC that had the greatest date was selected in order to give the customer the benefit of not accounting for this shipment until the last possible recorded date. The original format from the ATAC system was not in any form that could be efficiently analyzed. It was imperative to transform this data and have each document number on one line with the corresponding dates of the shipment pipeline in separate columns on the same line for easy analysis. It should be noted that with the exception of the AS1 and D6S dates, all other dates contained an alpha value as the first digit. For example, if it was supposed to be the 353 date, then is was shown as E53. This alpha value represented a particular hour of shipment. For example the letter A represented the time 0001-0100, the letter B, 0101-0200, the letter C 0201-0300, ...all the way through the letter Z with the exception of letters I and O which are not used in

this system, 2301-2400 (DoD 4500.32-R, Vol I:F-7-2, 1987) (Howard, 1997). This was a further hindrance to quick data analysis as each alpha value had to be converted into the appropriate numeric value in order to perform calculations and analysis. The appropriate numeric value was determined by using an Ada program that took the TX1 date and the D6S date and determined the appropriate first numeral. For example, if the TX1 date was 253 and the D6S date was 284 and another record assigned to the same document number showed a value of E68, then the numeral 2 was assigned in place of the E.

During collection of organic data many incomplete and inaccurate data records were found. To conduct a complete analysis, any DIC that had any of the following errors was excluded:

1. Conflicting APOEs - The APOEs within the same document number conflicted
2. Missing AS1 Ship Dates
3. Missing TX1 Ship Dates
4. Missing APOD Receipt Dates
5. Missing APOD Ship Dates
6. Missing D6S Receipt Dates
7. Illegal Flow—dates from shipment to final receipt were not sequential

Out of 9819 lines of data, 1287 different document numbers were produced. Only 545 document numbers did not contain any of the errors listed above to exclude them from analysis. This demonstrates that of all the records received, only 42% of all document numbers met the criteria to be used in the analysis.

The reasons for rejection and the number rejected for each reason are as follows:

Table 7 - Organic Data Rejection

Total Records Read	9819
Total Resulting Groups of Document Numbers	1287
Unusable Groups:	
Conflicting APOEs	109
Missing AS1 Dates	237
Missing TX1 Dates	308
Missing APOD Receipt Dates	16
Missing APOD Ship Dates	0
Missing D6S Dates	0
Illegal Date Flow	72

Poor data recording and management not only impacts the ability to analyze and improve a given area, but may have an effect on exercises, operations, and actual deployments. In fact, during DESERT STORM, data management had many significant impacts as recently noted in the book So Many, So Much, So Far, So Fast:

> Lack of document discipline and slow, partial, inaccurate, and generally lackadaisical data entry were also major impediments to intransit visibility in the DTS, all of which stemmed from the same problem that had created the multitude of service transportation systems that could not talk to each other: nobody in the DoD had control or oversight of the ITV process. (Matthew, et al, 1995:10)

Commercial Data

Commercial data were collected in order to compare transportation pipeline times between the organic transportation system and Federal Express. Federal Express was chosen to represent commercial carriers because they transport a majority of commercially carried cargo bound for Spangdahlem. Table 8 contains the percentage of cargo shipped by carrier.

Table 8 - Percentage of Commercial Cargo Carried to Spangdahlem

Federal Express	55%
DHL	19%
Emery	19%
Burlington	7%

The percentages for each carrier were obtained from a ten month period in 1996 - January through March and June through December. Data for the months of April and May were not available (Bass, 1997). It was assumed that 10 months of data would adequately represent the commercial carriers serving Spangdahlem AB, Germany.

ATAC could only provide commercial carrier data on the initial ship date and final receipt date. Because this lack of data would not allow us to compare equivalent segments of the organic pipeline to the commercial pipeline and because the data in ATACS was only 42% accurate, it was decided to obtain the necessary data directly from Federal Express. In the attempt to obtain data from the five month test period from Federal Express, Mr. Bill Endres, the Program Management Advisor for Federal Express, was contacted. He stated the data for shipments drop off their system after about 30-60 days. Since the test period was much older than 60 days from the date of request, the data were not available (Endres, 1997).

In order to fully analyze Federal Express shipment times, Federal Express provided three sources of data:

1. Actual Data
2. Flight Schedule
3. Estimated Pipeline Segment Averages

Federal Express provided shipment data for the month of February 1997 to represent the total pipeline time for the commercial carrier. February 1997 was chosen as this was the most current information available at the time of request. The flight schedule (Appendix C) and estimated pipeline segment averages were used to calculate average duration for each segment of the transportation pipeline.

The February 1997 report provided the following categories of information:

Table 9 - Federal Express Information Categories

1	Origination
2	Origination Zip Code
3	Tracking Number
4	Date Shipped
5	Delivery Date
6	Delivery Time
7	Number of Delivery Days
8	Number of Type Packages
9	Shipment Weight
10	POD Recipient Name
11	Document Number

This report showed that 280 items were shipped to Spangdahlem during February 1997. Of these 280 items, six were excluded because the packages did not have a POD and 106 more excluded from the time calculations for the reasons listed in Table 10.

Table 10 - Exception Codes for Federal Express Cargo

EXCEPTION CODE	TOTAL NUMBER	DEFINITION
3	3	Incorrect Recipient Address
8	15	Recipient Not In/Business Closed
14	2	Shipment Returned to Sender
17	31	A Future Delivery Was Requested
24	30	Recipient Was Unavailable - Delivery Delayed
42	3	Holiday - Business Closed
49	1	Recipient Address Was Out of FEC Primary Delivery Area
50	1	Improper or Missing Regulatory Paperwork
52	16	Held package "cleared after sort down"
55	3	Package Held For Inspection by Federal or State Agency
60	1	Still in Bond Cage Pending Regulatory Clearance
TOTAL	**106**	

Of the 280 packages shipped via Federal Express, 168 met their delivery criteria and were included in their analysis. However, on occasion, numerous packages where shipped under the same tracking number. Thus, only 144 separate tracking numbers were used in our analysis.

III. Methodology and Data Analysis

Introduction

This chapter focuses on the methodology used to analyze the data and the results of that analysis. First, organic U.S. Air Force overall shipment time between origin and Spangdahlem AB, Germany was compared with Federal Express overall shipment time.

After comparing the overall shipment times, each segment of the transportation pipeline was compared for differences between the two transportation providers in order to determine where significant differences exist.

Comparison of Shipment Times

Using the data provided by Federal Express (Appendix B) (February 1997) and Air Force organic data (Appendix A) the following descriptive statistics were derived:

Table 11 - Total Transit Time

	MEAN	MEDIAN	MODE	STANDARD DEVIATION	VARIANCE	# OF OBSERVATIONS
ORGANIC	6.86 ($\bar{x}_1$)	6	5	6.21 (s_1)	38.56 (σ_1^2)	545
FEDERAL EXPRESS	2.77 ($\bar{x}_2$)	3	2	1.11 (s_2)	1.24 (σ_2^2)	144

NOTE: Because Federal Express does not deliver on Saturday or Sunday, weekends were not included in their transit time calculations. In order to accurately account for total shipment time from the customer's perspective, the appropriate number of days were added to each shipment total delivery time when weekends were involved.

In order to determine the possibility of outliers in the data, the frequency distributions for FedEx and organic shipments were created in Table 12.

Table 12 - Frequency Distribution of FedEx Shipments

# DAYS	FEDEX	%	CUMUL.	ORGANIC	%	CUMUL.
1	1	0.7%	0.7%	0	0.0%	0.0%
2	68	47.2%	47.9%	13	2.4%	2.4%
3	51	35.4%	83.3%	14	2.6%	5.0%
4	20	13.9%	97.2%	76	13.9%	18.9%
5	1	0.7%	97.9%	125	22.9%	41.8%
6	1	0.7%	98.6%	121	22.2%	64.0%
7	1	0.7%	99.3%	80	14.7%	78.7%
8			99.3%	34	6.2%	85.0%
9			99.3%	16	2.9%	87.9%
10			99.3%	23	4.2%	92.1%
11	1	0.7%	100.0%	14	2.6%	94.7%
12				6	1.1%	95.8%
13				4	0.7%	96.5%
14				1	0.2%	96.7%
15				0	0.0%	96.7%
16				3	0.6%	97.2%
17				0	0.0%	97.2%
18				2	0.4%	97.6%
19				1	0.2%	97.8%
20				1	0.2%	98.0%
21				3	0.6%	98.5%
22				1	0.2%	98.7%
23				2	0.4%	99.1%
24				2	0.4%	99.4%
33				1	0.2%	99.6%
81				1	0.2%	99.8%
104				1	0.2%	100.0%
TOTAL	**144**	**100.0%**		**545**	**100.0%**	

Noting the significant variance attributed to the overall organic shipment times (Table 11) and dispersed frequency distribution in Table 12, a Box and Whisker Plot and Stem and Leaf Plot were used to determine any probable outliers for possible elimination from the statistical tests for both the organic and Federal Express data. Based upon the Box and Whisker Plot and the Stem and Leaf Plot, the data selected for elimination from the organic shipment times as probable outliers were total shipment times of 20 or greater and the data selected for elimination from the Federal Express times as probable outliers

was the 11 day shipment time. The outliers for each system were selected for elimination because they were not regular occurrences and did not indicate a constant problem. After removal of the probable outliers from the organic and Federal Express data, 97.8% of the original organic data and 99.3% of the Federal Express data will still be intact for statistical analysis.

After removal of the probable outliers from the organic and Federal Express data, the following descriptive statistics were derived:

Table 13 - Total Transit Time After Removal of Outliers

	MEAN	MEDIAN	MODE	STANDARD DEVIATION	VARIANCE	# OF OBSERVATIONS
ORGANIC	6.24 ($\bar{x}_1$)	6	5	2.39 (s_1)	5.72 (σ_1^2)	533
FEDERAL EXPRESS	2.71($\bar{x}_2$)	3	2	.88 (s_2)	.77 (σ_2^2)	143

According to the Central Limit Theorem:

> If a random sample of *n* observations is selected from a population (any population), then, when *n* is sufficiently large, the sampling distribution of $\bar{x}$ will be approximately a normal distribution. The larger the sample size, *n*, the better will be the normal approximation to the sampling distribution of $\bar{x}$. (McClave and Benson, 1994:282).

McClave and Benson further state that in most real-life applications, the shape of the population distribution will not be known and an $n \geq 30$ is required to invoke the Central Limit Theorem. Given this Theorem, and the large sample sizes (shown in Table 13) the assumption of $\bar{x}_1$ and $\bar{x}_2$ each having approximately normal sampling distributions is met and the Large-Sample Test of Hypothesis for $\mu_1 - \mu_2$ can be used to test the differences in means.

The Large-Sample Test of Hypothesis will be used on the data before removal of any outliers and then used again after the outliers are removed. The following Large-Sample Test of Hypothesis for $(\mu_1 - \mu_2)$ was used for statistical analysis.

The two tailed test was conducted as follows:

Ho: $(\mu_1 - \mu_2) = Do$

Ha: $(\mu_1 - \mu_2) \neq Do$

where D_o = hypothesized difference between the means is zero.

Test Statistic: $z = (\bar{x}_1 - \bar{x}_2) - D_o / \ \sigma_{(\bar{x}_1 - \bar{x}_2)}$

where $\sigma_{(\bar{x}_1 - \bar{x}_2)} = \sqrt{\sigma_1^2 / n_1 + \sigma_2^2 / n_2}$

Rejection Region: $z < -z_{\alpha/2}$ or $z > z_{\alpha/2}$

Inserting the values from Table 11 into the test statistic formula results in a test statistic of 14.51. Given this result, H_o is rejected and it must be concluded that the average total shipment times between the organic system and Federal Express are different at a .01 α level of significance. Additionally, after removal of the probable outliers, the re-computed test statistic was 27.81 (Table 16). Given this result, H_o is rejected and it must be concluded that average total shipment times are still significantly different after the removal of the probable outliers.

Comparison of Pipeline Segments

After determining a significant difference between movement times of Air Force organic movement and Federal Express, the next step was to determine which segments

of the transportation pipeline exhibited statistical differences between the two carriers. The segments of the organic transportation pipeline and the Federal Express pipeline are shown in Table 14.

Table 14 - Pipeline Segments

Segment	1	2	3	4	5	Total
Organic	Depot ship to APOE Receipt	APOE Receipt to APOE Ship to APOD	APOE Ship to APOD Receipt	APOD Receipt to APOD Ship	APOD Ship to Final Receipt	Total Ship Time
Federal Express	Origination to Receipt at MEM Hub	MEM Receipt to MEM Ship to FRA	MEM Ship to FRA Receipt	FRA Receipt to FRA Ship	FRA Ship to Final Receipt	Total Ship Time

Further comments on analysis will be limited to the data without the outliers (Table 16). The descriptive statistics for all five segments of the organic pipeline were determined based on the data from ATAC as stated in chapter 2. However, for the Federal Express pipeline, these parameters were available for only the total ship time. For segments 1, 2, 4, and 5 the average for each segment was calculated by Mr. Kevin Gorman, Government Sales Executive, Federal Express Corporation. Refer to Table 15 for estimates of each pipeline segment. The average for segment 3 of the Federal Express pipeline was taken as the total time from Federal Express' flight schedule (Appendix C) for transit from the Memphis, Tennessee hub to the Frankfurt, Germany hub.

Because of our data collection limitations, variance was only obtained from the total shipment time data. In order to ensure a good test of the means between the organic segments and the Federal Express segments, two tests for each segment were performed.

The first test (Test 1 - Table 16) used zero (0) as the variance for Federal Express in the denominator. By using zero for the Federal Express variance, the denominator is smaller and may drive the test to statistical significance. In the second test (Test 2 - Table 16), the variance of Federal Express' total pipeline (.77 as shown in Table 16) was assigned to each segment. By putting the total variance into each segment of the pipeline, the maximum possible variance attributable to the system was put in each segment as if each segment individually caused all the variance in the total system. If the results of Test 1 and Test 2 are the same, then it can be concluded that the variance of the Federal Express pipeline had no effect on the comparative analysis. Additionally, if by using zero in Test 1 for the variance in the Federal Express segment and the results are not statistically significant, then Test 2 will not be performed as the test will produce results that are even less statistically significant.

Applying the same test statistic as was used in the total shipment time comparison with the same confidence level ($\alpha = .01$), each of the segments were tested to determine if there was a statistical difference of the averages. Table 16 indicates the descriptive statistics and the Test 1 and Test 2 z-scores for the overall shipment time and each individual segment.

Table 15 - Computations on Total Transit and Segment Times Before Removal of Outliers

SEGMENT		1	2	3	4	5	Total
ORGANIC	MEAN	1.81	2.01	0.43	0.39	2.22	6.86
	STD	1.62	1.29	1.02	0.51	5.84	6.21
	VAR	2.62	1.66	1.04	0.26	34.09	38.56
	MODE	1	2	0	0	1	5
	MEDIAN	1	2	0	0	1	6
FEDERAL EXPRESS	MEAN	0.2708	0.1875	0.50	0.2917	0.3333	2.77
	STD						1.11
	VAR						1.24
	MODE						
	MEDIAN						
TEST 1	Test Statistic	22.20	33.02	-1.60	4.50	7.54	14.51
TEST 2	Test Statistic	13.29	16.88	-.68	1.03	7.07	14.51
CRITICAL VALUE		± 2.57	± 2.57	± 2.57	± 2.57	± 2.57	± 2.57
SIGNIFICANT		Yes	Yes	No	Yes/No	Yes	Yes

Table 16 - Computations on Total Transit and Segment Times After Removal of Outliers

SEGMENT		1	2	3	4	5	Total
ORGANIC	MEAN	1.74	1.96	0.41	0.39	1.73	6.24
	STD	1.35	1.16	.90	0.51	1.71	2.39
	VAR	1.83	1.36	.81	0.26	2.94	5.72
	MODE	1	2	0	0	1	5
	MEDIAN	1	2	0	0	1	6
FEDERAL EXPRESS	MEAN	0.2708	0.1875	0.50	0.2917	0.3333	2.77
	STD						1.11
	VAR						1.24
	MODE						
	MEDIAN						
TEST 1	Test Statistic	25.07	35.09	-2.31	4.45	18.81	27.81
TEST 2	Test Statistic	15.65	19.90	-1.08	1.28	13.37	27.81
CRITICAL VALUE		± 2.57	± 2.57	± 2.57	± 2.57	± 2.57	± 2.57
SIGNIFICANT		Yes	Yes	No	Yes/No	Yes	Yes

NOTE: Segments 1 through 5 do not add up to total time because the first five segments are estimated averages while the total ship time was derived from the February 1997 shipment data provided by Federal Express. The sum of the averaged segment times of 1.5833 (Table 16 values for segments 1-5) do not equal the 2.71 obtained from actual overall shipment time data because the estimated averages do not include weekends and do not account for the variance that undoubtedly occurs.

The results of Test 1 indicate the difference between the segment and total shipment time means of each system were statistically significant with the exception of segment 3. The results of Test 2 indicate the difference between the segment and total

shipment time means of each system were statistically significant with the exception of segments 3 and 4.

Limitations

The results presented have many limitations that must be addressed. When comparing the organic data to the Federal Express data, the organic data was given in whole days whereas the Federal Express data was given in hours and then converted to a fraction of a day. The process of converting the Federal Express time to days helps to ensure an accurate accountability of each part of the day, whereas the organic data is given only in "full" days. In the organic system, if a package was received a few minutes after midnight, an entire day would be added to the delivery time instead of only a few minutes.

Another limitation of the data is that the February 1997 data from Federal Express provided only 143 total shipments which were used to determine the descriptive statistics. Additionally, the tests would have been more credible if the actual data for each segment of the Federal Express pipeline could have acquired.

IV. Conclusions and Recommendations

Introduction

The purpose of this chapter is to discuss the conclusions drawn from the analysis of the Spangdahlem Air Base delivery time data. Included in this chapter is a brief synopsis of the research, a general review of the research findings, a discussion of research implications, and a list of suggested areas for further research.

Research Synopsis

The primary purpose of this research was to determine if commercial carriers deliver military cargo originating in the Continental United States (CONUS) to Spangdahlem Air Base, Germany faster than the military's own organic transportation system. The second objective, if commercial carriers are faster, was to determine which portions of the military's transportation pipeline causes the delay in delivery time. Data for the military transportation system were collected from the Advanced Traceability and Cargo (ATAC) system, and data representing commercial carrier services was provided by representatives from FedEx. The evaluation of the two service providers was accomplished by statistically analyzing the mean delivery times and then comparing the mean time for each of the five pipeline segments for the military system with the estimated times for the commercial carrier.

Summary of Findings

During the time periods evaluated, the mean delivery time for the military's organic transportation system from CONUS to Spangdahlem was 6.24 days, while FedEx's mean delivery time was 2.71 days. Statistical analysis using the standard z statistic indicated a significant difference between the two mean delivery times at an α level of .01. The two-tailed test showed mean delivery time of the military transportation system was significantly larger than that for FedEx. Further statistical analysis of each segment of the transportation pipeline revealed that only the flight times between the CONUS APOE and the Europe APOD were not statistically different for the two systems. Every other segment, including the time to get the cargo to the APOE, the time at the APOE, the time at the APOD, and the time to transport the cargo from the APOD to Spangdahlem was statistically larger for the military's organic transportation system.

Discussion of Segments

Segment one, from the depot to the APOE was significantly larger for the organic transportation system than for the commercial system. Since commercial express carriers provide this transportation in the military's organic system, the comparison is the time it takes FedEx (or other carrier) to transport the item from the depot to their Memphis hub and the time it takes the carrier to transport the item from the depot to Dover AFB, Delaware - the Air Force APOE for this study. As stated earlier, the average for FedEx for this segment was .2708 days and 1.74 days for the organic system. It should not be surprising that the organic system takes longer for this segment realizing that FedEx would transport the item to their hub (also their APOE) in Memphis and then continue its

movement to Dover. Thus, FedEx has as an obvious time advantage during this segment. When moved commercially to Germany, this segment would be complete when it arrived in Memphis. According to Andy Figueroa, AFMC Transportation Combat Readiness Branch Chief, 1.74 days average for this segment is not unreasonable. After a Material Release Order (MRO) is released at the depot, the transportation department at the depot prepares the item for shipment and places in the FedEx (or other carrier) bin. The carrier representative then comes by and picks up the cargo for onward movement. This pickup could occur on the same day if the MRO was released early enough in the day, which is often the case, since express carriers schedule several pickups from the depots daily. When this happens, the item would be delivered the next day at Dover, AFB; thus incurring a one day delivery period. However, if the MRO was released late in the day, the item would not be picked up until the following day. It would then not be delivered to Dover until the second day after the MRO; thus incurring a two day delivery period. Another consideration for this segment period is the inclusion of weekends. As stated earlier, FedEx and other carriers do not deliver on weekends. Thus, an item picked up on Friday will not be delivered until Monday. This commercial practice obviously increases the average time for this segment. According to Mr. Figueroa, the depot ships the items as soon as possible after receiving the shipment notice without regards to flight schedules at the APOE.

One way to reduce this segment for the organic system would be to only release items for shipment at the depot so that it could be picked up by the express carrier that day and delivered the next day. However, since this is only a time accounting tactic, this would not affect the overall shipment time from the customer's perspective.

Segment two of the pipeline consists of the port hold and handling time at the APOE - Dover AFB aerial port for the organic system and Memphis, TN for FedEx. This segment is also statistically longer for the organic system; taking about two days at Dover and about 4.5 hours at Memphis. AMC's records confirm our findings by indicating that Dover's port hold time for high priority items during 1996 was 48.5 hours. Currently, one C-5 and one KC-135 fly daily channel missions from Dover AFB, Delaware to Ramstein AFB, Germany. According to Lt Col Bellacicco, aerial port operations officer at Dover AFB, the aerial port receives about one thousand packages from express carriers daily. The small express packages, generally delivered by 12:30 p.m. to the port, are immediately in-processed and placed on pallets for loading on a KC-135 that departs at 4:45 p.m. However, large and outsized priority cargo cannot be placed on a KC-135 because of the cargo hold size restrictions of the aircraft. Large items such as an F-15 wing may sit 3-4 days in the port waiting for space on a C-5 aircraft. Another problem that extends port hold time, according to the operations officer is the unreliability of the C-5. Too many times, cargo is delayed at the port simply because the aircraft breaks and cannot be transported until the aircraft is repaired. Beginning on 10 June 1997, the C-5 was replaced with the more reliable, yet smaller, C-17 to lessen this problem.

Thus, according to Lt Col Bellacicco, the large port hold time is in part due to the large items that FedEx refuses to carry and must sit around until space on a large military aircraft is available. One way to reduce this segment for the organic system would be to schedule both the KC-135 and the C-5 or C-17 after the FedEx delivery each day. Then, the high priority items could be immediately placed on a departing aircraft that day.

Segment three consists of the actual flight time between Dover AFB and Ramstein AFB, Germany. There is no significant difference at the .01 α level between the commercial system and the military organic system unless all the variance for the commercial system is placed in this segment. Since this is unrealistic, it will not be addressed.

Segment four is the port hold time at APOD. For the organic system, it consists of the time from aircraft block time (when the aircraft officially lands) to the time of inputting information into the Consolidated Aerial Port System (CAPS). For FedEx it is the time between check-in of the package until it is released for movement to Spangdahlem. The Ramstein port hold time is significantly different from the commercial hold time at Frankfurt International Airport only when all of the variance of the commercial system is placed in this segment. Since this is not realistic, there may not be a significant difference between the two systems for this segment.

Segment five of the system is the transportation time between the Aerial Port of Debarkation (Ramstein for the organic system and Frankfurt International Airport for the commercial system) and the Spangdahlem AFB Supply office. Once again, the organic system is significantly longer than is the commercial system. The cargo is trucked from the APOD to Spangdahlem for both systems. The drive is approximately four to six hours. The commercial system reasonably averages about eight hours for this segment. However, the organic system averages about 1.73 days. For the organic system, the Army's 28th Transportation Battalion picks up a truckload every day from the aerial port and delivers the cargo to the Spangdahlem Supply office (Little, 1997). One possible

cause of delay is that if there is more than one truckload of cargo, the excess cargo may have to wait one or more days to be delivered to Spangdahlem. Another possible cause of the large average segment time is that cargo may arrive after the truck departs to Spangdahlem. Thus the cargo would wait one day awaiting transportation. These two possibilities could combine to create this large average segment time. The obvious solution to this problem is to schedule the departure of the truck after the aircraft have arrived and downloaded. Additionally, if one truck cannot handle all of the Spangdahlem cargo, then arrange for an additional truck to carry the additional cargo. In the future, when a credible intransit visibility system is implemented DoD wide, the Army will be able to schedule the necessary number of trucks in advance and provide better service.

Conclusions Drawn From Research

The primary conclusion drawn from this research is that the commercial carriers are indeed able to transport small items (weighing less than 150 pounds) to Spangdahlem AB, Germany faster than the military's traditional organic transportation system. A secondary conclusion taken from this research is that every segment of the pipeline except the actual flight time between CONUS and Europe all take significantly longer for the military system than for the commercial system.

Discussion of Research Implications

This comparison of the military's organic transportation system with commercial express package carriers may be stacked against the organic system because commercial express carriers have designed their business processes to ensure quick delivery of small packages. However, the Air Force's transportation system is designed to transport troops

and cargo in support of a war effort. Except for extraordinary circumstances such as during Desert Shield/Storm when the Air Force implemented Desert Express to transport high priority items to the Southwest Asia, the Air Force transportation system is not designed to provide express delivery of high priority items. In short, the Air Force has not been asked to provide the same level of service as commercial express carriers. A more meaningful comparison would be to redesign the Air Force process, establish an organic express delivery service, and compare this capability to commercial carrier performance.

One recent Air Mobility Command initiative, labeled World Wide Express (WWX), is an attempt to take advantage of commercial carriers' swift delivery system by contracting out the movement of all high priority cargo originating and/or terminating at overseas bases, weighing less than 150 pounds, and meeting the appropriate size dimensions to members of the Civil Reserve Air Fleet (CRAF). Phase II of this plan would allow commercial carriers to deliver all cargo meeting the above specifications weighing less than 1000 pounds (Curtis, 1997).

Although this plan would allow for faster delivery of high priority cargo than is currently available using the current military system and may lead to higher aircraft mission capable rates in the short-term, the long-term implications are uncertain. Will the carriers that transport the military's cargo in peace time continue to provide the same level of service during war? Will the carriers, some of whom are actually logistics managers, begin to operate the military's base level logistics operations as outsourcing expands? Will Air Mobility Command continue to fly normal channel missions to overseas bases if the majority of cargo is being shipped via commercial air carriers?

Since the organic capability is already available (in the form of C5s, C141s, C17s, etc.), this plan will inevitably increase transportation costs to the Air Force. The channel missions and training missions will continue to fly, but the DoD will be paying to have much of the cargo transported by commercial carriers even though there may be capacity available on organic aircraft.

One area of the military transportation system that needs improving is the information/data systems. The output from ATAC contained codes in both the column headings and in the data that required extensive deciphering using DoD regulations and knowledge from experienced transportation personnel. The meaning of many of these arcane codes were unknown to many transportation personnel. Additionally, the ATAC output contained unnecessary data that only complicated data analysis. For example, ATAC provided the expected receipt date at a location, another date indicating cargo trailer information, and finally the actually receipt date. Data analysis could be much easier if only the information required could be produced. Another major problem with the DoD transportation information systems is the reliability of data collection. Much of the data collection is still accomplished by manual input. These antiquated methods lead to mistakes and omissions in the data. More than 50% of the cargo data collected for this research analysis could not be analyzed because of errors in the data.

The DoD is currently undertaking a major project to improve this problem by implementing the Global Transportation Network (GTN). GTN, in addition to improving in-transit visibility within the DoD transportation system, will also improve the accuracy and reliability of data. The continued support of Lean Logistics and adopting best

business practices will eventually improve data reliability as the DoD expands the use of bar codes and bar code readers to automatically collect and record cargo data.

Recommendations for Further Research

During the course of this narrowly defined research project, numerous possibilities for further research were identified. The following suggestions provide additional research topics that could prove useful to the transportation community.

Transportation Costs. Depending on the size and weight of the item and the distance to be carried, commercial carriers may charge less than AMC. Thus, military units wanting to use commercial carriers claim they will incur less cost and faster service by contracting out airlift services. However, in light of the fact the Air Force has already incurred the fixed costs of owning its fleet of cargo aircraft, overall cost to the DoD of paying commercial carriers for capability that the Air Force already maintains should be analyzed.

Effect of Outsourcing Peace Time Airlift on Aircraft Utilization. In the past, aircraft utilization has been a prime indicator of the efficiency of AMC and thus has been monitored closely for every mission. As outsourcing becomes more prevalent in the U.S. military, more peace time airlift will be contracted out. The impact of outsourcing airlift on the utilization rate of Air Force cargo planes should be analyzed.

Effects of World Wide Express (WWX) on Air Mobility Command. The World Wide Express plan has potentially far-reaching effects on Air Mobility Command. World Wide Express is expected to move approximately 40% of the cargo now being transported by AMC (Curtis, 1997). With a reduction in their workload, how will

AMC's capacity be affected? How will manning be affected? What will be the effect on transportation costs for cargo moved by AMC? How will this affect AMC's ability to provide airlift during war? The WWX concept provides numerous opportunities for further research.

Transportation Time Outliers. Due to the scope of this research effort, the cause of the 12 outliers in this study were not determined. However, the understanding of outliers is often a productive effort that reveals problems in the system. Further research to discern the source of these outliers might present crucial information to improve the organic transportation system.

Improvement of Transportation Information Systems. This research project uncovered considerable difficulties for the authors when trying to collect usable data. The assistance of a computer programmer was needed to extract the data from the ATAC system as well as to write a computer program to organize the data into a usable and meaningful format. In comparison to the simple and clear report from FedEx, the military information system is outdated and wasteful. The Global Transportation Network project should ensure clear and meaningful outputs.

Appendix A. Organic Data

DOC NUMBER	CONSINGOR DODAAC	APOE	AS1 SHIP DATE	TX1 SHIP TO APOE	REC AT APOE	SHIP FROM APOE	TK6 APOD REC DATE	TK6 APOD SHIP DATE	D6S REC DATE	Diff AS1 and TX1	TX1 to APOE	APOE rec to APOE Ship	APOE Ship to APOD Rec	APOD Rec to APOD Ship	APOD Ship to D6S Rec	TX1 Ship to D6S Rec
FB562152370193	FB44	DOV	242	245	245	248	248	249	349	3	0	3	0	1	100	104
FB562160299515	FB48	DOV	36	36	37	39	39	40	117	0	1	2	0	1	77	81
FB562160510593	SW32	DOV	55	56	57	59	59	59	89	1	1	2	0	0	30	33
FB562153120059	SW32	DOV	315	316	335	338	339	339	340	1	19	3	1	0	1	24
FB562160369505	FB44	DOV	37	37	38	40	41	41	61	0	1	2	1	0	20	24
FB562153120071	SW32	DOV	314	315	318	320	320	320	338	1	3	2	0	0	18	23
FB562160180089	SW35	DOV	30	23	32	43	43	44	46	-7	9	11	0	1	2	23
FB562153100025	SW35	DOV	317	313	320	329	329	330	335	-4	7	9	0	1	5	22
FB562160049530	FB48	DOV	9	5	11	13	25	25	26	-4	6	2	12	0	1	21
FB562160199518	SW31	DOV	23	24	33	42	42	43	45	1	9	9	0	1	2	21
FB562160539507	FB44	DOV	53	53	55	58	58	58	74	0	2	3	0	0	16	21
FB562160829601	FB66	DOV	82	82	83	86	87	87	102	0	1	3	1	0	15	20
The data above are the 12 outliers selected for elimination from the analysis as indicated in the thesis text.																
FB562160580155	SW32	DOV	62	62	65	67	67	67	81	0	3	2	0	0	14	19
FB562151300006	SW32	DOV	342	343	346	348	348	348	361	1	3	2	0	0	13	18
FB562153349500	SW05	DOV	334	334	335	337	337	338	352	0	1	2	0	1	14	18
FB562160099561	FB28	DOV	9	9	10	13	25	25	25	0	1	3	12	0	0	16
FB562160370253	SW32	DOV	40	41	46	52	54	54	57	1	5	6	2	0	3	16
FB562160740165	SW32	DOV	77	77	80	81	82	82	93	0	3	1	1	0	11	16
FB562153190167	SW32	DOV	321	321	325	332	332	332	335	0	4	7	0	0	3	14
FB562153050259	SW32	DOV	321	322	325	332	332	332	335	1	3	7	0	0	3	13
FB562153200069	SW32	DOV	324	322	326	328	328	328	335	-2	4	2	0	0	7	13
FB562153200210	SW32	DOV	321	322	325	332	332	332	335	1	3	7	0	0	3	13
FB562160370446	SW32	DOV	39	40	47	49	49	50	53	1	7	2	0	1	3	13
FB562153190179	SW32	DOV	328	329	331	340	340	340	341	1	2	9	0	0	1	12
FB562153330113	SW32	DOV	348	349	352	354	354	355	361	1	3	2	0	1	6	12
FB562153480570	SW32	DOV	349	349	353	355	356	356	361	0	4	2	1	0	5	12
FB562160110569	SW32	DOV	26	27	31	37	37	37	39	1	4	6	0	0	2	12
FB562160320232	SW35	DOV	44	41	46	48	49	50	53	-3	5	2	1	1	3	12
FB562160870921	SW32	DOV	89	90	93	95	95	95	102	1	3	2	0	0	7	12
FB562160030380	SW32	DOV	4	5	9	11	11	12	16	1	4	2	0	1	4	11
FB562160039509	SW32	DOV	5	6	10	11	11	12	17	1	4	1	0	1	5	11
FB562160080467	SW32	DOV	18	19	22	24	28	28	30	1	3	2	4	0	2	11
FB562160090358	SW32	DOV	17	18	18	18	19	19	29	1	0	0	1	0	10	11
FB562160180292	SW32	DOV	26	27	31	34	34	35	38	1	4	3	0	1	3	11
FB562160300065	SW32	DOV	46	47	55	57	57	57	58	1	8	2	0	0	1	11
FB562160370245	SW35	DOV	40	40	44	46	46	46	51	0	4	2	0	0	5	11
FB562160370431	SW32	DOV	40	40	44	46	46	46	51	0	4	2	0	0	5	11
FB562160380012	SW32	DOV	46	46	51	53	54	54	57	0	5	2	1	0	3	11
FB562160400254	SW32	DOV	41	42	44	50	50	50	53	1	2	6	0	0	3	11
FB562160522549	SW32	DOV	102	102	106	108	110	110	113	0	4	2	2	0	3	11
FB562160599510	FB48	DOV	60	60	61	62	64	65	71	0	1	1	2	1	6	11
FB562160990090	SW32	DOV	101	102	102	104	104	104	113	1	0	2	0	0	9	11
FE562153260016	SW32	DOV	335	335	339	341	341	342	346	0	4	2	0	1	4	11
FB562152790650	SW32	DOV	335	336	339	341	341	342	346	1	3	2	0	1	4	10
FB562153050332	SW32	DOV	308	309	311	314	314	314	319	1	2	3	0	0	5	10
FB562153250035	SW32	DOV	335	335	338	340	340	340	345	0	3	2	0	0	5	10
FB562153250192	SW32	DOV	329	329	332	335	335	335	339	0	3	3	0	0	4	10
FB562153330223	SW32	DOV	335	336	339	341	341	342	346	1	3	2	0	1	4	10
FB562160030247	SW32	DOV	12	13	16	18	18	18	23	1	3	2	0	0	5	10
FB562160040170	SW35	DOV	44	44	46	53	53	53	54	0	2	7	0	0	1	10
FB562160060028	SW32	DOV	12	13	16	18	18	18	23	1	3	2	0	0	5	10
FB562160080485	SW32	DOV	12	13	16	18	18	18	23	1	3	2	0	0	5	10
FB562160090443	SW04	DOV	19	20	22	24	28	28	30	1	2	2	4	0	2	10
FB562160100147	SW31	DOV	19	20	22	24	28	28	30	1	2	2	4	0	2	10
FB562160110229	SW32	DOV	12	13	16	18	18	18	23	1	3	2	0	0	5	10
FB562160170191	SW32	DOV	22	21	24	25	29	29	31	-1	3	1	4	0	2	10
FB562160180102	SW31	DOV	19	20	22	24	28	28	30	1	2	2	4	0	2	10
FB562160230408	SW35	DOV	33	30	36	38	38	38	40	-3	6	2	0	0	2	10
FB562160250006	SW32	DOV	27	28	30	37	37	37	38	1	2	7	0	0	1	10
FB562160370404	SW32	DOV	40	41	44	46	46	46	51	1	3	2	0	0	5	10

FB562160380095	SW32	DOV	40	41	44	46	46	46	51	1	3	2	0	0	5	10
FB562160380189	SW32	DOV	40	41	44	46	46	46	51	1	3	2	0	0	5	10
FB562160440136	SW35	DOV	47	47	51	53	54	54	57	0	4	2	1	0	3	10
FB562160610319	SW32	DOV	67	68	71	74	74	74	78	1	3	3	0	0	4	10
FB562161000338	SW35	DOV	113	110	115	117	118	118	120	-3	5	2	1	0	2	10
FB562161029517	FB48	DOV	103	103	106	108	110	110	113	0	3	2	2	0	3	10
FB562152200277	SW32	DOV	328	329	331	337	337	338	338	1	2	6	0	1	0	9
FB562153339504	SW32	DOV	352	353	355	357	362	362	362	1	2	2	5	0	0	9
FB562153420195	SW32	DOV	351	352	355	357	358	359	361	1	3	2	1	1	2	9
FB562153450078	SW32	DOV	351	352	355	357	358	359	361	1	3	2	1	1	2	9
FB562160110115	SW32	DOV	16	17	18	18	19	19	26	1	1	0	1	0	7	9
FB562160110639	SW32	DOV	13	14	16	18	18	18	23	1	2	2	0	0	5	9
FB562160120606	SW32	DOV	16	16	18	18	19	19	25	0	2	0	1	0	6	9
FB562160449515	FB48	DOV	44	44	45	47	52	52	53	0	1	2	5	0	1	9
FB562160450714	SW35	DOV	54	52	57	59	59	59	61	-2	5	2	0	0	2	9
FB562160470197	SW31	DOV	50	51	57	59	59	59	60	1	6	2	0	0	1	9
FB562160479500	SW32	DOV	54	55	61	63	63	63	64	1	6	2	0	0	1	9
FB562160519510	SW32	DOV	54	55	61	63	63	63	64	1	6	2	0	0	1	9
FB562160580387	SW32	DOV	104	104	108	111	111	111	113	0	4	3	0	0	2	9
FB562160780451	SW32	DOV	82	83	86	89	89	90	92	1	3	3	0	1	2	9
FB562160800106	SW32	DOV	82	83	86	89	89	90	92	1	3	3	0	1	2	9
FB562160850336	SW32	DOV	89	90	93	95	95	95	99	1	3	2	0	0	4	9
FB562152610188	SW32	DOV	352	353	354	357	357	357	361	1	1	3	0	0	4	8
FB562152980094	SW32	DOV	347	348	352	354	354	355	356	1	4	2	0	1	1	8
FB562153210091	SW32	DOV	332	332	333	337	337	337	340	0	1	4	0	0	3	8
FB562153210227	SW32	DOV	347	348	352	354	355	355	356	1	4	2	1	0	1	8
FB562153290005	SW32	DOV	334	334	339	341	341	341	342	0	5	2	0	0	1	8
FB562153450080	SW35	DOV	353	353	355	357	358	359	361	0	2	2	1	1	2	8
FB562153460206	SW35	DOV	354	353	356	357	358	359	361	-1	3	1	1	1	2	8
FB562153549515	FB48	DOV	356	354	355	357	362	362	362	-2	1	2	5	0	0	8
FB562160120485	SW32	DOV	16	17	18	18	19	19	25	1	1	0	1	0	6	8
FB562160120584	SW32	DOV	16	17	18	18	19	19	25	1	1	0	1	0	6	8
FB562160160055	SW32	DOV	17	18	18	18	19	19	26	1	0	0	1	0	7	8
FB562160169527	FB48	DOV	17	17	18	18	19	19	25	0	1	0	1	0	6	8
FB562160180315	SW32	DOV	22	23	24	25	29	29	31	1	1	1	4	0	2	8
FB562160190198	SW32	DOV	29	31	31	37	37	37	39	2	0	6	0	0	2	8
FB562160230171	SW32	DOV	30	31	31	37	37	37	39	1	0	6	0	0	2	8
FB562160259516	FB48	DOV	36	29	31	34	34	35	37	-7	2	3	0	1	2	8
FB562160260060	SW32	DOV	30	31	31	37	37	37	39	1	0	6	0	0	2	8
FB562160290017	SW35	DOV	33	32	36	38	38	38	40	-1	4	2	0	0	2	8
FB562160299506	FB44	DOV	29	29	30	34	34	35	37	0	1	4	0	1	2	8
FB562160299522	FB28	DOV	30	30	31	37	37	37	38	0	1	6	0	0	1	8
FB562160300072	SW31	DOV	30	31	31	37	37	37	39	1	0	6	0	0	2	8
FB562160300111	SW35	DOV	37	37	39	43	43	43	45	0	2	4	0	0	2	8
FB562160309507	FB48	DOV	30	30	31	37	37	37	38	0	1	6	0	0	1	8
FB562160320062	SW35	DOV	37	37	39	43	43	43	45	0	2	4	0	0	2	8
FB562160449501	FB48	DOV	44	44	45	48	49	50	52	0	1	3	1	1	2	8
FB562160449509	FB60	DOV	44	44	45	48	49	50	52	0	1	3	1	1	2	8
FB562160460008	SW32	DOV	72	72	75	77	77	78	80	0	3	2	0	1	2	8
FB562160460011	SW32	DOV	72	72	75	77	77	78	80	0	3	2	0	1	2	8
FB562160530509	SW31	DOV	80	81	85	86	87	87	89	1	4	1	1	0	2	8
FB562160610338	SW31	DOV	62	63	65	67	67	67	71	1	2	2	0	0	4	8
FB562160750321	SW32	DOV	81	81	85	86	87	87	89	0	4	1	1	0	2	8
FB562160939505	FB28	DOV	93	93	94	97	97	99	101	0	1	3	0	2	2	8
FE562152930144	SW32	DOV	348	348	353	355	356	356	356	0	5	2	1	0	0	8
FE562152930146	SW32	DOV	348	348	353	355	356	356	356	0	5	2	1	0	0	8
FB562152890182	SW32	DOV	348	349	352	354	354	355	356	1	3	2	0	1	1	7
FB562153120342	SW32	DOV	341	342	345	348	348	349	349	1	3	3	0	1	0	7
FB562153219504	SW32	DOV	334	335	335	339	341	341	342	1	0	4	2	0	1	7
FB562153219505	SW32	DOV	333	334	335	338	339	339	341	1	1	3	1	0	2	7
FB562153259500	FB48	DOV	331	331	332	336	337	337	338	0	1	4	1	0	1	7
FB562153310157	SW32	DOV	334	335	338	340	340	340	342	1	3	2	0	0	2	7
FB562153319500	FB48	DOV	332	331	332	336	337	337	338	-1	1	4	1	0	1	7
FB562153350197	SW32	DOV	341	342	345	348	348	349	349	1	3	3	0	1	0	7
FB562153389511	FB48	DOV	338	338	339	341	341	342	345	0	1	2	0	1	3	7
FB562153419505	FB48	DOV	341	342	345	348	348	349	349	1	3	3	0	1	0	7
FB562153450216	SW32	DOV	348	349	352	354	354	355	356	1	3	2	0	1	1	7
FB562153459507	FB48	DOV	345	345	346	349	350	350	352	0	1	3	1	0	2	7
FB562153459534	FB48	DOV	345	345	346	348	348	348	352	0	1	2	0	0	4	7
FB562153460393	SW32	DOV	349	349	353	355	356	356	356	0	4	2	1	0	0	7
FB562153499409	FB48	DOV	349	349	352	354	354	355	356	0	3	2	0	1	1	7
FB562153499503	FB48	DOV	352	349	352	354	354	355	356	-3	3	2	0	1	1	7
FB562160020182	SW32	DOV	5	5	10	11	11	12	12	0	5	1	0	1	0	7
FB562160030386	SW32	DOV	24	25	29	31	31	31	32	1	4	2	0	0	1	7

FB562160039508	SW32	DOV	9	10	12	15	15	16	17	1	2	3	0	1	1	7
FB562160040296	SW32	DOV	32	33	36	37	38	38	40	1	3	1	1	0	2	7
FB562160049514	FB44	DOV	5	5	10	11	11	12	12	0	5	1	0	1	0	7
FB562160050450	SW32	DOV	10	11	15	16	16	17	18	1	4	1	0	1	1	7
FB562160050454	SW32	DOV	24	25	29	31	31	31	32	1	4	2	0	0	1	7
FB562160050455	SW32	DOV	24	25	29	31	31	31	32	1	4	2	0	0	1	7
FB562160059500	FB23	DOV	5	5	10	11	11	12	12	0	5	1	0	1	0	7
FB562160059521	FB48	DOV	5	5	10	11	11	12	12	0	5	1	0	1	0	7
FB562160080733	SW32	DOV	10	11	12	15	15	16	18	1	1	3	0	1	2	7
FB562160089500	SW32	DOV	9	10	12	15	15	15	17	1	2	3	0	0	2	7
FB562160089510	SW32	DOV	9	10	12	15	15	16	17	1	2	3	0	1	1	7
FB562160089524	SW35	DOV	9	9	11	13	13	13	16	0	2	2	0	0	3	7
FB562160099519	SW32	DOV	10	11	15	16	17	17	18	1	4	1	1	0	1	7
FB562160099560	FB48	DOV	9	9	11	11	13	13	16	0	2	0	2	0	3	7
FB562160109530	FB48	DOV	11	11	12	15	15	16	18	0	1	3	0	1	2	7
FB562160169503	FB48	DOV	16	16	17	19	19	20	23	0	1	2	0	1	3	7
FB562160169513	FB48	DOV	17	17	18	18	19	19	24	0	1	0	1	0	5	7
FB562160169519	SW31	DOV	29	30	30	34	34	35	37	1	0	4	0	1	2	7
FB562160180135	SW32	DOV	23	23	25	26	27	27	30	0	2	1	1	0	3	7
FB562160199512	FB46	DOV	23	23	24	25	27	27	30	0	1	1	2	0	3	7
FB562160300063	SW32	DOV	34	33	37	39	39	40	40	-1	4	2	0	1	0	7
FB562160300291	SW32	DOV	32	33	36	37	38	38	40	1	3	1	1	0	2	7
FB562160389515	FB28	DOV	39	39	43	44	44	45	46	0	4	1	0	1	1	7
FB562160400237	SW31	DOV	71	72	73	75	76	76	79	1	1	2	1	0	3	7
FB562160430098	SW32	DOV	45	46	47	49	49	50	53	1	1	2	0	1	3	7
FB562160449516	FB61	DOV	45	45	46	48	49	50	52	0	1	2	1	1	2	7
FB562160449526	FB48	DOV	45	45	46	48	49	50	52	0	1	2	1	1	2	7
FB562160450226	SW32	DOV	52	53	57	59	59	59	60	1	4	2	0	0	1	7
FB562160450590	SW32	DOV	57	58	59	63	64	64	65	1	1	4	1	0	1	7
FB562160459275	FB44	DOV	45	45	46	49	49	50	52	0	1	3	0	1	2	7
FB562160459276	FB48	DOV	45	45	46	48	49	50	52	0	1	2	1	1	2	7
FB562160459277	FB62	DOV	45	45	46	49	49	50	52	0	1	3	0	1	2	7
FB562160459279	FB46	DOV	45	45	46	49	49	50	52	0	1	3	0	1	2	7
FB562160459280	SW31	DOV	45	45	46	49	49	50	52	0	1	3	0	1	2	7
FB562160459511	FB44	DOV	45	45	46	48	49	50	52	0	1	2	1	1	2	7
FB562160469520	FB48	DOV	47	46	47	49	49	50	53	-1	1	2	0	1	3	7
FB562160530674	SW31	DOV	74	75	78	79	80	80	82	1	3	1	1	0	2	7
FB562160539509	FB48	DOV	54	54	57	58	58	59	61	0	3	1	0	1	2	7
FB562160579518	FB64	DOV	59	58	59	63	64	64	65	-1	1	4	1	0	1	7
FB562160589509	FB48	DOV	58	58	59	63	63	63	65	0	1	4	0	0	2	7
FB562160590214	FB48	DOV	82	82	85	86	86	86	89	0	3	1	0	0	3	7
FB562160619514	FB48	DOV	64	64	66	67	68	68	71	0	2	1	1	0	3	7
FB562160660145	SW32	DOV	67	68	71	72	73	73	75	1	3	1	1	0	2	7
FB562160670513	SW32	DOV	71	72	73	75	76	76	79	1	1	2	1	0	3	7
FB562160700003	SW31	DOV	72	73	73	75	76	76	80	1	0	2	1	0	4	7
FB562160710078	SW31	DOV	72	73	73	75	76	76	80	1	0	2	1	0	4	7
FB562160710080	SW31	DOV	72	73	73	75	76	76	80	1	0	2	1	0	4	7
FB562160719505	FB48	DOV	71	71	73	76	76	76	78	0	2	3	0	0	2	7
FB562160730233	SW32	DOV	81	82	86	88	88	88	89	1	4	2	0	0	1	7
FB562160759536	FB28	DOV	78	78	80	81	82	82	85	0	2	1	1	0	3	7
FB562160799503	FB44	DOV	79	79	81	85	85	85	86	0	2	4	0	0	1	7
FB562160859511	FB48	DOV	85	85	86	89	89	90	92	0	1	3	0	1	2	7
FB562160859514	FB48	DOV	85	85	86	89	89	90	92	0	1	3	0	1	2	7
FB562160870808	SW32	DOV	93	94	95	97	97	99	101	1	1	2	0	2	2	7
FB562160939513	FB48	DOV	93	93	95	97	97	99	100	0	2	2	0	2	1	7
FB562160939514	FB48	DOV	93	93	94	97	97	99	100	0	1	3	0	2	1	7
FB562160991714	SW32	DOV	102	103	106	108	108	108	110	1	3	2	0	0	2	7
FB562161069511	FB48	DOV	106	106	108	110	110	110	113	0	2	2	0	0	3	7
FB562161080392	SW32	DOV	109	110	114	116	116	117	117	1	4	2	0	1	0	7
FE562153260017	SW32	DOV	332	332	334	336	336	337	339	0	2	2	0	1	2	7
FE562153260028	FD70	DOV	334	334	338	340	340	340	341	0	4	2	0	0	1	7
FE562153260029	FD70	DOV	334	334	338	340	340	340	341	0	4	2	0	0	1	7
FB562152551813	SW32	DOV	332	333	334	336	336	337	339	1	1	2	0	1	2	6
FB562153110126	SW32	DOV	342	343	346	348	348	348	349	1	3	2	0	0	1	6
FB562153120085	SW32	DOV	339	340	341	342	344	345	346	1	1	1	2	1	1	6
FB562153170756	SW32	DOV	339	340	341	342	344	345	346	1	1	1	2	1	1	6
FB562153190062	SW32	DOV	342	343	346	348	348	348	349	1	3	2	0	0	1	6
FB562153190064	SW32	DOV	342	343	346	348	348	348	349	1	3	2	0	0	1	6
FB562153240018	SW32	DOV	332	333	334	336	336	337	339	1	1	2	0	1	2	6
FB562153250085	SW32	DOV	331	332	333	336	336	337	338	1	1	3	0	1	1	6
FB562153250258	SW32	DOV	332	333	334	336	336	337	339	1	1	2	0	1	2	6
FB562153300005	SW32	DOV	332	333	334	336	336	337	339	1	1	2	0	1	2	6
FB562153310155	SW32	DOV	334	335	338	340	340	340	341	1	3	2	0	0	1	6
FB562153310252	SW32	DOV	334	335	338	340	340	340	341	1	3	2	0	0	1	6

FB562153320381	SW31	DOV	333	334	334	336	336	337	340	1	0	2	0	1	3	6
FB562153320436	SW32	DOV	349	350	353	355	356	356	356	1	3	2	1	0	0	6
FB562153329501	FB44	DOV	333	332	334	336	336	337	338	-1	2	2	0	1	1	6
FB562153349512	SW32	DOV	335	336	339	341	341	341	342	1	3	2	0	0	1	6
FB562153349513	SW32	DOV	335	336	339	341	341	341	342	1	3	2	0	0	1	6
FB562153359506	FB28	DOV	335	335	338	340	340	340	341	0	3	2	0	0	1	6
FB562153380198	SW32	DOV	347	348	349	351	353	353	354	1	1	2	2	0	1	6
FB562153380345	SW32	DOV	347	347	348	352	352	352	353	0	1	4	0	0	1	6
FB562153400145	SW32	DOV	347	347	348	352	352	352	353	0	1	4	0	0	1	6
FB562153460012	FD70	DOV	349	350	353	355	356	356	356	1	3	2	1	0	0	6
FB562153460070	SW32	DOV	349	350	353	355	356	356	356	1	3	2	1	0	0	6
FB562153469510	FB48	DOV	346	346	347	348	349	349	352	0	1	1	1	0	3	6
FB562153469513	FB61	DOV	346	346	347	348	349	349	352	0	1	1	1	0	3	6
FB562153479519	FB48	DOV	348	348	349	351	353	353	354	0	1	2	2	0	1	6
FB562153489500	FB48	DOV	348	348	349	351	353	353	354	0	1	2	2	0	1	6
FB562153489514	FB48	DOV	352	348	349	351	353	353	354	-4	1	2	2	0	1	6
FB562153489517	FB48	DOV	348	348	349	351	353	353	354	0	1	2	2	0	1	6
FB562153490806	SW32	DOV	354	355	357	359	359	360	361	1	2	2	0	1	1	6
FB562160020091	SW32	DOV	5	6	10	11	11	12	12	1	4	1	0	1	0	6
FB562160039520	FB44	DOV	3	2	4	6	6	6	8	-1	2	2	0	0	2	6
FB562160080699	SW32	DOV	9	10	11	13	13	13	16	1	1	2	0	0	3	6
FB562160090270	SW32	DOV	11	12	15	16	16	17	18	1	3	1	0	1	1	6
FB562160090369	SW32	DOV	10	11	12	15	15	16	17	1	1	3	0	1	1	6
FB562160090607	SW32	DOV	11	12	15	16	16	17	18	1	3	1	0	1	1	6
FB562160100007	SW32	DOV	11	12	15	16	16	17	18	1	3	1	0	1	1	6
FB562160100286	SW32	DOV	11	12	15	16	16	17	18	1	3	1	0	1	1	6
FB562160109502	FB48	DOV	12	10	11	13	13	13	16	-2	1	2	0	0	3	6
FB562160109512	FB48	DOV	11	11	12	15	15	16	17	0	1	3	0	1	1	6
FB562160109534	FB48	DOV	11	11	12	15	15	16	17	0	1	3	0	1	1	6
FB562160110196	SW32	DOV	25	26	29	30	31	31	32	1	3	1	1	0	1	6
FB562160119513	FB48	DOV	11	11	12	15	15	16	17	0	1	3	0	1	1	6
FB562160119517	FB48	DOV	12	11	12	15	15	16	17	-1	1	3	0	1	1	6
FB562160129515	FB44	DOV	12	12	15	16	17	17	18	0	3	1	1	0	1	6
FB562160149500	SW32	DOV	17	17	19	20	20	20	23	0	2	1	0	0	3	6
FB562160169526	SW32	DOV	16	17	17	19	19	20	23	1	0	2	0	1	3	6
FB562160170419	SW32	DOV	24	24	26	28	28	28	30	0	2	2	0	0	2	6
FB562160259515	FB28	DOV	26	26	29	30	31	31	32	0	3	1	1	0	1	6
FB562160259518	FB28	DOV	26	26	29	30	31	31	32	0	3	1	1	0	1	6
FB562160259519	SW35	DOV	26	26	29	30	31	31	32	0	3	1	1	0	1	6
FB562160259520	FB48	DOV	26	26	30	30	31	31	32	0	4	0	1	0	1	6
FB562160290250	SW32	DOV	40	40	44	46	46	46	46	0	4	2	0	0	0	6
FB562160290551	SW32	DOV	39	40	43	44	44	45	46	1	3	1	0	1	1	6
FB562160300282	SW32	DOV	53	54	57	58	58	59	60	1	3	1	0	1	1	6
FB562160309508	SW32	DOV	30	31	33	36	36	36	37	1	2	3	0	0	1	6
FB562160310553	SW31	DOV	58	59	59	63	64	64	65	1	0	4	1	0	1	6
FB562160319514	FB48	DOV	31	31	32	33	36	36	37	0	1	1	3	0	1	6
FB562160319515	FB64	DOV	33	33	36	37	38	38	39	0	3	1	1	0	1	6
FB562160319519	FB44	DOV	31	31	32	33	34	34	37	0	1	1	1	0	3	6
FB562160330276	SW32	DOV	39	40	43	44	44	45	46	1	3	1	0	1	1	6
FB562160330642	SW32	DOV	39	40	43	44	44	45	46	1	3	1	0	1	1	6
FB562160360150	SW31	DOV	58	59	59	63	64	64	65	1	0	4	1	0	1	6
FB562160370236	SW32	DOV	39	40	40	42	42	43	46	1	0	2	0	1	3	6
FB562160370395	FB64	DOV	51	51	52	53	54	54	57	0	1	1	1	0	3	6
FB562160370448	SW32	DOV	39	40	43	44	44	45	46	1	3	1	0	1	1	6
FB562160370449	SW32	DOV	39	40	43	44	44	45	46	1	3	1	0	1	1	6
FB562160370452	SW32	DOV	39	40	43	44	44	45	46	1	3	1	0	1	1	6
FB562160370457	SW32	DOV	39	40	44	46	46	46	46	1	4	2	0	0	0	6
FB562160370761	SW31	DOV	47	48	50	51	51	52	54	1	2	1	0	1	2	6
FB562160389267	SW35	DOV	39	39	40	43	43	44	45	0	1	3	0	1	1	6
FB562160399507	FB48	DOV	40	40	43	44	44	45	46	0	3	1	0	1	1	6
FB562160450293	SW31	DOV	46	47	50	51	51	52	53	1	3	1	0	1	1	6
FB562160460237	SW31	DOV	66	67	67	71	72	72	73	1	0	4	1	0	1	6
FB562160469515	FB48	DOV	46	46	47	49	49	50	52	0	1	2	0	1	2	6
FB562160470169	SW31	DOV	50	51	51	53	54	54	57	1	0	2	1	0	3	6
FB562160470198	SW32	DOV	74	75	78	80	80	80	81	1	3	2	0	0	1	6
FB562160470385	SW31	DOV	58	59	59	63	64	64	65	1	0	4	1	0	1	6
FB562160519507	FB48	DOV	51	51	52	53	54	54	57	0	1	1	1	0	3	6
FB562160520057	SW32	DOV	53	54	57	58	58	59	60	1	3	1	0	1	1	6
FB562160521342	SW32	DOV	53	54	57	58	58	59	60	1	3	1	0	1	1	6
FB562160522408	SW32	DOV	54	55	58	60	60	60	61	1	3	2	0	0	1	6
FB562160529508	FB48	DOV	52	52	54	57	57	57	58	0	2	3	0	0	1	6
FB562160530442	SW32	DOV	54	55	58	60	60	60	61	1	3	2	0	0	1	6
FB562160530598	SW31	DOV	58	59	59	63	64	64	65	1	0	4	1	0	1	6
FB562160550359	SW31	DOV	65	66	67	68	69	69	72	1	1	1	1	0	3	6

FB562160550361	SW31	DOV	58	59	59	63	64	64	65	1	0	4	1	0	1	6
FB562160570206	SW32	DOV	68	69	72	74	74	74	75	1	3	2	0	0	1	6
FB562160580500	SW32	DOV	68	69	72	74	74	74	75	1	3	2	0	0	1	6
FB562160590377	SW32	DOV	61	62	65	67	67	67	68	1	3	2	0	0	1	6
FB562160609501	SW35	DOV	65	65	66	67	68	68	71	0	1	1	1	0	3	6
FB562160609512	FB28	DOV	61	61	64	66	66	66	67	0	3	2	0	0	1	6
FB562160610326	SW31	DOV	64	65	66	67	68	68	71	1	1	1	1	0	3	6
FB562160619504	FB48	DOV	61	61	64	66	66	66	67	0	3	2	0	0	1	6
FB562160619508	FB48	DOV	61	61	64	66	66	66	67	0	3	2	0	0	1	6
FB562160649508	FB48	DOV	87	65	66	67	68	68	71	-22	1	1	1	0	3	6
FB562160659506	FB46	DOV	66	65	66	67	68	68	71	-1	1	1	1	0	3	6
FB562160680347	SW32	DOV	72	73	74	77	77	77	79	1	1	3	0	0	2	6
FB562160700005	SW31	DOV	72	73	73	75	76	76	79	1	0	2	1	0	3	6
FB562160710263	SW32	DOV	72	73	74	77	77	77	79	1	1	3	0	0	2	6
FB562160719510	FB44	DOV	72	72	72	74	75	75	78	0	0	2	1	0	3	6
FB562160720424	SW31	DOV	74	75	75	77	77	77	81	1	0	2	0	0	4	6
FB562160729708	FB46	DOV	72	72	74	75	75	75	78	0	2	1	0	0	3	6
FB562160730241	SW31	DOV	75	76	78	79	80	80	82	1	2	1	1	0	2	6
FB562160739517	FB48	DOV	73	73	74	77	77	77	79	0	1	3	0	0	2	6
FB562160740291	SW31	DOV	75	76	78	79	80	80	82	1	2	1	1	0	2	6
FB562160749508	SW32	DOV	75	75	78	79	80	80	81	0	3	1	1	0	1	6
FB562160750149	SW32	DOV	78	79	80	81	82	82	85	1	1	1	1	0	3	6
FB562160799514	FB48	DOV	79	79	80	81	81	81	85	0	1	1	0	0	4	6
FB562160829501	FB48	DOV	82	82	85	86	87	87	88	0	3	1	1	0	1	6
FB562160860039	SW32	DOV	87	88	89	90	90	91	94	1	1	1	0	1	3	6
FB562160879512	FB48	DOV	88	88	89	92	93	93	94	0	1	3	1	0	1	6
FB562160949501	FB48	DOV	94	94	95	97	97	99	100	0	1	2	0	2	1	6
FB562161079502	FB48	DOV	107	107	108	110	110	110	113	0	1	2	0	0	3	6
FB562161079513	FB30	DOV	108	108	110	112	112	113	114	0	2	2	0	1	1	6
FB562161080276	SW32	DOV	110	111	114	116	116	117	117	1	3	2	0	1	0	6
FB562161090025	SW32	DOV	110	111	114	116	116	117	117	1	3	2	0	1	0	6
FB562161130598	SW07	DOV	114	114	115	118	118	119	120	0	1	3	0	1	1	6
FB562161149507	FB48	DOV	114	114	115	118	118	119	120	0	1	3	0	1	1	6
FE562160030248	SW32	DOV	5	6	10	11	11	12	12	1	4	1	0	1	0	6
FE562160080453	SW31	DOV	18	19	19	22	23	23	25	1	0	3	1	0	2	6
FB562152970237	SW32	DOV	343	344	346	348	348	348	349	1	2	2	0	0	1	5
FB562153260166	SW32	DOV	333	333	335	337	337	338	338	0	2	2	0	1	0	5
FB562153260238	FD70	DOV	333	334	335	337	337	338	339	1	1	2	0	1	1	5
FB562153260306	SW32	DOV	340	341	342	344	344	345	346	1	1	2	0	1	1	5
FB562153310110	SW31	DOV	333	334	334	336	336	337	339	1	0	2	0	1	2	5
FB562153310316	SW32	DOV	333	334	335	337	337	338	339	1	1	2	0	1	1	5
FB562153320276	SW31	DOV	333	334	334	336	336	337	339	1	0	2	0	1	2	5
FB562153339511	SW31	DOV	333	334	334	337	337	338	339	1	0	3	0	1	1	5
FB562153350172	SW32	DOV	340	341	342	344	344	345	346	1	1	2	0	1	1	5
FB562153350451	SW32	DOV	346	347	348	349	350	351	352	1	1	1	1	1	1	5
FB562153350467	SW32	DOV	340	341	342	344	344	345	346	1	1	2	0	1	1	5
FB562153409504	FB44	DOV	340	340	342	342	342	342	345	0	2	0	0	0	3	5
FB562153460069	SW32	DOV	350	351	353	355	356	356	356	1	2	2	1	0	0	5
FB562153460632	SW32	DOV	350	351	353	355	356	356	356	1	2	2	1	0	0	5
FB562153460842	SW32	DOV	350	351	353	355	356	356	356	1	2	2	1	0	0	5
FB562153469506	FB48	DOV	347	347	348	349	350	351	352	0	1	1	1	1	1	5
FB562153469516	FB48	DOV	347	347	348	349	350	351	352	0	1	1	1	1	1	5
FB562153469521	FB48	DOV	347	347	348	349	350	351	352	0	1	1	1	1	1	5
FB562153479507	FB48	DOV	347	347	348	349	350	351	352	0	1	1	1	1	1	5
FB562153479512	FB48	DOV	347	347	348	349	350	351	352	0	1	1	1	1	1	5
FB562153479513	FB46	DOV	347	347	348	349	350	351	352	0	1	1	1	1	1	5
FB562153499516	SW32	DOV	352	351	353	355	356	356	356	-1	2	2	1	0	0	5
FB562160029501	FB48	DOV	4	4	5	7	7	8	9	0	1	2	0	1	1	5
FB562160029507	FB48	DOV	4	4	5	7	7	8	9	0	1	2	0	1	1	5
FB562160040261	SW31	DOV	25	26	26	30	30	31	31	1	0	4	0	1	0	5
FB562160049515	FB48	DOV	4	4	5	7	7	8	9	0	1	2	0	1	1	5
FB562160050312	SW31	DOV	65	66	66	67	68	68	71	1	0	1	1	0	3	5
FB562160051368	SW32	DOV	26	27	30	30	31	31	32	1	3	0	1	0	1	5
FB562160080456	SW31	DOV	25	26	26	30	30	31	31	1	0	4	0	1	0	5
FB562160080480	SW32	DOV	40	41	44	46	46	46	46	1	3	2	0	0	0	5
FB562160100361	SW31	DOV	12	13	15	16	16	17	18	1	2	1	0	1	1	5
FB562160100363	SW31	DOV	12	13	15	16	16	17	18	1	2	1	0	1	1	5
FB562160119521	FB66	DOV	12	12	15	16	16	17	17	0	3	1	0	1	0	5
FB562160120577	SW32	DOV	17	18	19	20	20	20	23	1	1	1	0	0	3	5
FB562160129503	FB48	DOV	12	12	15	16	16	17	17	0	3	1	0	1	0	5
FB562160129516	FB48	DOV	12	12	13	16	16	17	17	0	1	3	0	1	0	5
FB562160129517	SW32	DOV	13	13	15	16	17	17	18	0	2	1	1	0	1	5
FB562160129518	FB48	DOV	12	12	13	16	16	17	17	0	1	3	0	1	0	5
FB562160160201	SW32	DOV	17	18	19	20	20	20	23	1	1	1	0	0	3	5

FB562160179509	SW31	DOV	17	18	18	20	20	20	23	1	0	2	0	0	3	5
FB562160180246	SW31	DOV	58	59	60	62	62	62	64	1	1	2	0	0	2	5
FB562160180314	SW31	DOV	31	32	32	33	34	34	37	1	0	1	1	0	3	5
FB562160250106	SW32	DOV	40	41	44	46	46	46	46	1	3	2	0	0	0	5
FB562160250128	SW32	DOV	31	32	32	36	36	36	37	1	0	4	0	0	1	5
FB562160250254	SW31	DOV	33	34	36	38	38	38	39	1	2	2	0	0	1	5
FB562160250267	SW32	DOV	26	27	30	31	31	31	32	1	3	1	0	0	1	5
FB562160260068	SW32	DOV	37	38	39	40	41	41	43	1	1	1	1	0	2	5
FB562160260680	SW32	DOV	34	35	37	39	39	40	40	1	2	2	0	1	0	5
FB562160300178	SW32	DOV	88	89	92	93	93	93	94	1	3	1	0	0	1	5
FB562160320286	SW32	DOV	34	35	37	39	39	40	40	1	2	2	0	1	0	5
FB562160329505	FB48	DOV	32	32	33	36	36	36	37	0	1	3	0	0	1	5
FB562160330199	SW32	DOV	37	38	39	40	41	41	43	1	1	1	1	0	2	5
FB562160370447	SW32	DOV	39	40	40	42	42	43	45	1	0	2	0	1	2	5
FB562160380056	SW31	DOV	51	52	53	54	54	54	57	1	1	1	0	0	3	5
FB562160430405	SW32	DOV	51	52	52	53	54	54	57	1	0	1	1	0	3	5
FB562160430768	SW31	DOV	53	54	54	55	55	56	59	1	0	1	0	1	3	5
FB562160439517	SW31	DOV	46	47	47	49	49	50	52	1	0	2	0	1	2	5
FB562160469503	SW32	DOV	46	47	47	49	49	50	52	1	0	2	0	1	2	5
FB562160470386	SW31	DOV	51	52	52	53	54	54	57	1	0	1	1	0	3	5
FB562160519522	FB48	DOV	52	52	53	54	54	54	57	0	1	1	0	0	3	5
FB562160522555	SW32	DOV	55	56	58	60	60	60	61	1	2	2	0	0	1	5
FB562160522602	SW32	DOV	60	60	61	63	64	64	65	0	1	2	1	0	1	5
FB562160529515	FB48	DOV	52	52	53	54	54	54	57	0	1	1	0	0	3	5
FB562160530545	SW32	DOV	58	59	60	62	62	62	64	1	1	2	0	0	2	5
FB562160530549	SW32	DOV	54	55	55	58	58	58	60	1	0	3	0	0	2	5
FB562160530563	SW31	DOV	54	55	57	58	58	59	60	1	2	1	0	1	1	5
FB562160530594	SW31	DOV	54	55	57	58	58	59	60	1	2	1	0	1	1	5
FB562160530666	SW31	DOV	54	55	57	58	58	59	60	1	2	1	0	1	1	5
FB562160550018	SW32	DOV	58	59	60	62	62	62	64	1	1	2	0	0	2	5
FB562160570172	SW32	DOV	101	102	103	105	105	106	107	1	1	2	0	1	1	5
FB562160580289	SW32	DOV	62	63	65	67	67	67	68	1	2	2	0	0	1	5
FB562160590354	SW32	DOV	65	66	67	68	69	69	71	1	1	1	1	0	2	5
FB562160590358	SW31	DOV	61	62	64	66	66	66	67	1	2	2	0	0	1	5
FB562160590405	SW32	DOV	62	63	65	67	67	67	68	1	2	2	0	0	1	5
FB562160590510	SW32	DOV	61	62	62	66	66	66	67	1	0	4	0	0	1	5
FB562160590572	SW31	DOV	61	62	64	66	66	66	67	1	2	2	0	0	1	5
FB562160590574	SW31	DOV	61	62	64	66	66	66	67	1	2	2	0	0	1	5
FB562160590575	SW31	DOV	61	62	64	66	66	66	67	1	2	2	0	0	1	5
FB562160590580	SW31	DOV	61	62	64	66	66	66	67	1	2	2	0	0	1	5
FB562160590581	SW31	DOV	61	62	64	66	66	66	67	1	2	2	0	0	1	5
FB562160590582	SW31	DOV	61	62	64	66	66	66	67	1	2	2	0	0	1	5
FB562160599500	FB48	DOV	59	59	60	62	62	62	64	0	1	2	0	0	2	5
FB562160600103	SW32	DOV	62	63	65	67	67	67	68	1	2	2	0	0	1	5
FB562160600130	SW32	DOV	62	63	65	67	67	67	68	1	2	2	0	0	1	5
FB562160600483	SW31	DOV	65	66	67	68	69	69	71	1	1	1	1	0	2	5
FB562160610343	SW32	DOV	62	63	65	67	67	67	68	1	2	2	0	0	1	5
FB562160610557	SW32	DOV	62	63	65	67	67	67	68	1	2	2	0	0	1	5
FB562160640278	SW32	DOV	68	69	71	72	73	73	74	1	2	1	1	0	1	5
FB562160649506	SW32	DOV	69	70	72	74	74	74	75	1	2	2	0	0	1	5
FB562160660319	SW31	DOV	69	70	71	72	73	73	75	1	1	1	1	0	2	5
FB562160660349	SW31	DOV	69	70	71	72	73	73	75	1	1	1	1	0	2	5
FB562160669509	FB48	DOV	66	66	67	68	69	69	71	0	1	1	1	0	2	5
FB562160670455	SX31	DOV	69	70	71	72	73	73	75	1	1	1	1	0	2	5
FB562160670490	SW31	DOV	69	70	71	72	73	73	75	1	1	1	1	0	2	5
FB562160670518	SW32	DOV	73	74	75	77	77	77	79	1	1	2	0	0	2	5
FB562160710615	SW31	DOV	73	74	74	77	77	78	79	1	0	3	0	1	1	5
FB562160720004	SW32	DOV	73	74	75	77	77	77	79	1	1	2	0	0	2	5
FB562160720105	SW32	DOV	73	74	74	77	77	77	79	1	0	3	0	0	2	5
FB562160729516	FB48	DOV	73	73	74	77	77	77	78	0	1	3	0	0	1	5
FB562160739502	FB48	DOV	73	73	74	77	77	77	78	0	1	3	0	0	1	5
FB562160739505	FB48	DOV	73	73	74	77	77	77	78	0	1	3	0	0	1	5
FB562160739511	FB48	DOV	73	73	75	77	77	77	78	0	2	2	0	0	1	5
FB562160739521	FB48	DOV	73	73	74	77	77	77	78	0	1	3	0	0	1	5
FB562160739532	FB48	DOV	73	73	74	77	77	77	78	0	1	3	0	0	1	5
FB562160750172	SW32	DOV	76	77	78	79	80	80	82	1	1	1	1	0	2	5
FB562160750309	SW31	DOV	79	80	80	81	82	82	85	1	0	1	1	0	3	5
FB562160759701	SW31	DOV	75	75	77	77	78	78	80	0	2	0	1	0	2	5
FB562160780083	SW31	DOV	79	80	80	81	82	82	85	1	0	1	1	0	3	5
FB562160780147	SW31	DOV	79	80	80	81	82	82	85	1	0	1	1	0	3	5
FB562160780452	SW32	DOV	88	89	89	92	93	93	94	1	0	3	1	0	1	5
FB562160809506	FB48	DOV	80	80	81	82	83	83	85	0	1	1	1	0	2	5
FB562160850150	SW32	DOV	108	108	109	111	111	111	113	0	1	2	0	0	2	5
FB562160850244	SW32	DOV	86	87	88	90	90	90	92	1	1	2	0	0	2	5

FB562160850305	SW32	DOV	87	88	89	90	90	91	93	1	1	1	0	1	2	5
FB562160860023	SW32	DOV	87	88	89	90	90	91	93	1	1	1	0	1	2	5
FB562160860027	SW32	DOV	87	88	89	90	90	91	93	1	1	1	0	1	2	5
FB562160991710	SW32	DOV	101	102	103	105	105	106	107	1	1	2	0	1	1	5
FB562161010510	SW32	DOV	104	105	107	108	109	109	110	1	2	1	1	0	1	5
FB562161070077	SW32	DOV	108	109	110	112	112	113	114	1	1	2	0	1	1	5
FB562161070267	SW32	DOV	108	109	110	113	113	114	114	1	1	3	0	1	0	5
FB562161070320	SW32	DOV	108	109	110	112	112	113	114	1	1	2	0	1	1	5
FB562161089504	FB44	DOV	108	108	110	112	112	113	113	0	2	2	0	1	0	5
FB562161089509	FB30	DOV	108	108	110	112	112	113	113	0	2	2	0	1	0	5
FB562161100421	SW32	DOV	111	112	114	116	116	117	117	1	2	2	0	1	0	5
FE562160051173	SW32	DOV	40	41	44	46	46	46	46	1	3	2	0	0	0	5
FB562153339503	FB28	DOV	334	334	335	337	337	338	338	0	1	2	0	1	0	4
FB562153339514	FB48	DOV	338	334	335	337	337	338	338	-4	1	2	0	1	0	4
FB562153399509	FB48	DOV	345	345	346	348	348	348	349	0	1	2	0	0	1	4
FB562153419502	FB48	DOV	341	341	342	344	344	345	345	0	1	2	0	1	0	4
FB562153419503	FB48	DOV	341	341	342	344	344	345	345	0	1	2	0	1	0	4
FB562153459506	FB48	DOV	345	345	346	348	348	348	349	0	1	2	0	0	1	4
FB562153499504	FB48	DOV	352	352	353	355	356	356	356	0	1	2	1	0	0	4
FB562153509500	FB48	DOV	352	352	353	355	356	356	356	0	1	2	1	0	0	4
FB562153529500	FB48	DOV	352	352	353	355	356	356	356	0	1	2	1	0	0	4
FB562153529512	FB48	DOV	352	352	353	355	356	356	356	0	1	2	1	0	0	4
FB562160089502	FB48	DOV	8	8	10	11	11	12	12	0	2	1	0	1	0	4
FB562160090251	SW32	DOV	81	82	82	85	85	85	86	1	0	3	0	0	1	4
FB562160090357	SW32	DOV	27	28	30	31	31	31	32	1	2	1	0	0	1	4
FB562160120141	SW31	DOV	13	14	15	16	16	17	18	1	1	1	0	1	1	4
FB562160129519	FB48	DOV	13	13	15	16	16	17	17	0	2	1	0	1	0	4
FB562160160061	SW32	DOV	27	28	30	31	31	31	32	1	2	1	0	0	1	4
FB562160170420	SW31	DOV	18	19	19	20	20	20	23	1	0	1	0	0	3	4
FB562160190476	SW32	DOV	27	28	29	30	31	31	32	1	1	1	1	0	1	4
FB562160250213	SW32	DOV	27	28	30	31	31	31	32	1	2	1	0	0	1	4
FB562160250258	SW32	DOV	27	28	30	31	31	31	32	1	2	1	0	0	1	4
FB562160320018	SW31	DOV	48	49	50	51	51	52	53	1	1	1	0	1	1	4
FB562160330388	SW32	DOV	38	39	40	42	42	43	43	1	1	2	0	1	0	4
FB562160370092	SW32	DOV	38	39	40	42	42	43	43	1	1	2	0	1	0	4
FB562160370712	SW32	DOV	41	42	44	46	46	46	46	1	2	2	0	0	0	4
FB562160380048	SW32	DOV	41	42	44	46	46	46	46	1	2	2	0	0	0	4
FB562160389278	SW35	DOV	39	39	40	42	42	43	43	0	1	2	0	1	0	4
FB562160389527	FB48	DOV	39	39	40	42	42	43	43	0	1	2	0	1	0	4
FB562160389529	FB28	DOV	39	39	40	42	42	43	43	0	1	2	0	1	0	4
FB562160400353	SW32	DOV	41	42	44	46	46	46	46	1	2	2	0	0	0	4
FB562160430390	SW32	DOV	73	74	75	77	77	77	78	1	1	2	0	0	1	4
FB562160510457	SW31	DOV	52	53	54	55	55	56	57	1	1	1	0	1	1	4
FB562160510498	SW31	DOV	52	53	54	55	55	56	57	1	1	1	0	1	1	4
FB562160529561	SW31	DOV	52	53	53	54	54	54	57	1	0	1	0	0	3	4
FB562160530530	SW32	DOV	59	60	61	63	63	63	64	1	1	2	0	0	1	4
FB562160530671	SW31	DOV	60	61	61	62	64	65	65	1	0	1	2	1	0	4
FB562160530967	SW31	DOV	55	56	57	58	58	59	60	1	1	1	0	1	1	4
FB562160531049	SW31	DOV	55	56	58	58	58	59	60	1	2	0	0	1	1	4
FB562160539506	FB48	DOV	53	53	54	55	55	56	57	0	1	1	0	1	1	4
FB562160540162	SW32	DOV	69	70	71	72	73	73	74	1	1	1	1	0	1	4
FB562160540260	SW31	DOV	55	56	57	58	58	59	60	1	1	1	0	1	1	4
FB562160549507	FB48	DOV	58	54	55	57	57	57	58	-4	1	2	0	0	1	4
FB562160550353	SW31	DOV	66	67	68	69	69	70	71	1	1	1	0	1	1	4
FB562160579500	FB48	DOV	57	57	58	60	60	60	61	0	1	2	0	0	1	4
FB562160579502	FB48	DOV	57	57	58	60	60	60	61	0	1	2	0	0	1	4
FB562160590491	SW32	DOV	62	63	64	66	66	66	67	1	1	2	0	0	1	4
FB562160600064	SW32	DOV	66	67	68	69	69	70	71	1	1	1	0	1	1	4
FB562160610317	SW31	DOV	62	63	64	66	66	66	67	1	1	2	0	0	1	4
FB562160610404	SW31	DOV	62	63	64	66	66	66	67	1	1	2	0	0	1	4
FB562160610446	SW31	DOV	62	63	64	66	66	66	67	1	1	2	0	0	1	4
FB562160610507	SW31	DOV	62	63	64	66	66	66	67	1	1	2	0	0	1	4
FB562160610537	SW31	DOV	62	63	64	66	66	66	67	1	1	2	0	0	1	4
FB562160610547	SW31	DOV	62	63	64	66	66	66	67	1	1	2	0	0	1	4
FB562160640185	SW32	DOV	66	67	68	69	69	70	71	1	1	1	0	1	1	4
FB562160640289	SW31	DOV	66	67	67	68	69	69	71	1	0	1	1	0	2	4
FB562160650185	SW31	DOV	66	67	67	68	69	69	71	1	0	1	1	0	2	4
FB562160669502	FB48	DOV	67	67	68	69	69	70	71	0	1	1	0	1	1	4
FB562160669503	FB48	DOV	66	67	67	69	69	70	71	1	0	2	0	1	1	4
FB562160669518	FB44	DOV	67	67	68	69	69	70	71	0	1	1	0	1	1	4
FB562160670458	SW32	DOV	87	88	88	90	90	90	92	1	0	2	0	0	2	4
FB562160679519	FB48	DOV	67	67	68	69	69	70	71	0	1	1	0	1	1	4
FB562160689524	FB48	DOV	71	71	72	74	74	74	75	0	1	2	0	0	1	4
FB562160730297	SW32	DOV	80	81	82	83	84	84	85	1	1	1	1	0	1	4

FB562160730389	SW32	DOV	80	81	82	83	84	84	85	1	1	1	1	0	1	4
FB562160739514	FB48	DOV	74	74	75	77	77	77	78	0	1	2	0	0	1	4
FB562160749504	FB48	DOV	74	74	75	77	77	77	78	0	1	2	0	0	1	4
FB562160780082	SW32	DOV	80	81	82	83	84	84	85	1	1	1	1	0	1	4
FB562160819505	FB48	DOV	81	81	82	83	83	84	85	0	1	1	0	1	1	4
FB562160870627	FB48	DOV	103	103	104	106	106	106	107	0	1	2	0	0	1	4
FB562160879513	FB48	DOV	88	88	89	90	90	91	92	0	1	1	0	1	1	4
FB562160899517	FB44	DOV	90	90	92	93	93	94	94	0	2	1	0	1	0	4
FB562161069508	FB44	DOV	106	106	107	108	109	110	110	0	1	1	1	1	0	4
FB562161069509	FB44	DOV	106	106	107	108	109	110	110	0	1	1	1	1	0	4
FB562161089523	FB28	DOV	109	109	110	112	112	113	113	0	1	2	0	1	0	4
FB562161099505	FB48	DOV	109	109	110	112	112	113	113	0	1	2	0	1	0	4
FB562161099509	FB48	DOV	109	109	110	112	112	113	113	0	1	2	0	1	0	4
FB562161099514	FB44	DOV	109	109	110	112	112	113	113	0	1	2	0	1	0	4
FB562153459511	SW32	DOV	345	346	346	348	348	348	349	1	0	2	0	0	1	3
FB562153459514	SW32	DOV	345	346	346	348	348	348	349	1	0	2	0	0	1	3
FB562160039526	FB48	DOV	9	9	10	11	11	12	12	0	1	1	0	1	0	3
FB562160089522	FB28	DOV	9	9	10	11	11	12	12	0	1	1	0	1	0	3
FB562160470206	SW32	DOV	53	54	54	55	55	56	57	1	0	1	0	1	1	3
FB562160520060	SW31	DOV	53	54	54	55	55	56	57	1	0	1	0	1	1	3
FB562160520109	SW31	DOV	53	54	54	55	55	56	57	1	0	1	0	1	1	3
FB562160530592	SW31	DOV	57	58	58	60	60	60	61	1	0	2	0	0	1	3
FB562160650211	SW31	DOV	67	68	68	69	69	70	71	1	0	1	0	1	1	3
FB562160650267	SW31	DOV	67	68	68	69	69	70	71	1	0	1	0	1	1	3
FB562160650329	SW32	DOV	67	68	68	69	69	70	71	1	0	1	0	1	1	3
FB562160679505	FB48	DOV	67	69	69	70	71	71	72	2	0	1	1	0	1	3
FB562160820298	SW31	DOV	85	86	86	88	88	88	89	1	0	2	0	0	1	3
FB562160870625	SW32	DOV	90	91	92	93	93	94	94	1	1	1	0	1	0	3
FB562160090335	SW32	DOV	40	41	41	42	42	43	43	1	0	1	0	1	0	2
FB562160100335	FB44	DOV	93	92	92	93	93	93	94	-1	0	1	0	0	1	2
FB562160430540	SW31	DOV	50	51	51	52	52	52	53	1	0	1	0	0	1	2
FB562160450395	SW31	DOV	50	51	51	52	52	52	53	1	0	1	0	0	1	2
FB562160450441	SW31	DOV	50	51	51	52	52	52	53	1	0	1	0	0	1	2
FB562160450588	SW31	DOV	50	51	51	52	52	52	53	1	0	1	0	0	1	2
FB562160450642	SW31	DOV	50	51	51	52	52	52	53	1	0	1	0	0	1	2
FB562160460168	SW31	DOV	50	51	51	52	52	52	53	1	0	1	0	0	1	2
FB562160460199	SW31	DOV	50	51	51	52	52	52	53	1	0	1	0	0	1	2
FB562160470237	SW31	DOV	50	51	51	52	52	52	53	1	0	1	0	0	1	2
FB562160470238	SW31	DOV	50	51	51	52	52	52	53	1	0	1	0	0	1	2
FB562160470239	SW31	DOV	50	51	51	52	52	52	53	1	0	1	0	0	1	2
FB562160549533	FB48	DOV	55	57	57	58	58	59	59	2	0	1	0	1	0	2

RUN DATE: 04/03/97
RUN TIME: 02:38.35
SEQUENCE: COUNTRY/STATE/CITY/ZIP
SERVICE DAYS: 20
WGT: POUNDS

F E D E R A L E X P R E S S C O R P O R A T I O N
CUSTOMER TIME-IN-TRANSIT
ACCOUNT 2085 OFFSHORE/27
FEBRUARY

149321 PAGE : 2
11516 REPORT : FEQZ206-R01
DEPT-LOC : 249-010

CUSTOMER NUMBER 1672-4130-1

DESTINATION BREAKOUT OF INTERNATIONAL SHIPMENTS WITH POD (PART 2)*

DESTINATION CO	ST	CITY	ZIP	STA	TRACKING NUMBER	DATE SHIPPED	DELIVERY DATE	DEL TIME	# DEL DAYS	# OF PKGS	TYP SVC	SHIPMENT WEIGHT	POD RECIPIENT NAME	DOC TYPE	REFERENCE NOTES
US	AZ	LITCHFIELD PARK	85309	LUF	040052606035	02-25-97	02-27-97	09:40	2	1	IP	1.10	D.WAEVER	X	
		TUCSON	85707	TUS	040052684122	02-05-97	02-07-97	09:20	2	1	IP	3.30	S.ALNES	X	
	CA	SACRAMENTO	95652	SMF	040052684520	02-07-97	02-10-97	10:19	1	1	IP	2.20	P.LARECKI	X	
			95652	SMF	040052606094	02-25-97	02-27-97	10:08	2	1	IP	16.90	A.CAMPBELL	X	
			95652	SMF	040052606105	02-25-97	02-27-97	10:08	2	1	IP	30.80	A.CAMPBELL	X	
			95652	SMF	040052606245	02-26-97	02-28-97	10:10	2	1	IP	23.10	P.LARECKI	X	
			95652	SMF	040052606315	02-27-97	03-03-97	10:20	2	1	IP	4.40	A.CAMPBELL	X	
			95652	SMF	040052606422	02-28-97	03-03-97	10:20	1	1	IP	102.50	A.CAMPBELL	X	
			95652	SMF	040052606536	02-28-97	03-03-97	10:20	1	1	IP	112.40	A.CAMPBELL	X	
			95652	SMF	040052606540	02-28-97	03-03-97	10:20	1	1	IP	1.10	A.CAMPBELL	X	
			95652	SMF	040052685846	02-25-97	02-27-97	10:08	2	1	IP	12.10	A.CAMPBELL	X	
			95652	SMF	040052685850	02-25-97	02-27-97	10:08	2	1	IP	30.80	A.CAMPBELL	X	
			95652	SMF	040052606061	02-25-97	02-26-97	11:15	1	1	IP	30.80	M.ANTHONY	X	
			95652	SMF	040052684844	02-14-97	02-21-97	12:07	5	2	IP	13.20	R.LAVIE	X	
			95652	SMF	040052685496	02-21-97	02-24-97	10:07	1	1	IP	26.40	P.LARECKI	X	
			95652	SMF	040052685533	02-21-97	02-25-97	10:08	2	1	IP	33.00	P.LARECKE	X	
			95652	SMF	040052685754	02-21-97	02-24-97	10:07	1	1	IP	83.70	P.LARECKI	X	
			95652	SMF	040052685802	02-24-97	02-26-97	10:07	2	1	IP	2.20	P.LARECKI	X	
			95652	SMF	040052684774	02-12-97	02-14-97	09:47	2	1	IP	20.20	P.JARECKI	X	
			95652	SMF	040052684785	02-12-97	02-14-97	09:47	2	1	IP	14.10	P.JARECKI	X	
			95652	SMF	040052684800	02-13-97	02-17-97	10:17	2	1	IP	22.00	A.CAMPBELL	X	
			95652	SMF	040052684881	02-14-97	02-17-97	10:17	1	1	IP	11.90	A.CAMPBELL	X	
			95652	SMF	040052684903	02-14-97	02-17-97	10:17	1	1	IPF	110.20	A.CAMPBELL	X	
			95652	SMF	040052684936	02-14-97	02-17-97	10:17	1	1	IP	18.70	A.CAMPBELL	X	
			95652	SMF	040052684063	02-04-97	02-06-97	10:25	2	1	IP	8.80	P.LARECKI	X	
			95652	SMF	040052684170	02-05-97	02-07-97	10:15	2	1	IP	28.20	P.KIRKPATRICK	X	
			95652	SMF	040052684181	02-05-97	02-07-97	10:15	2	1	IP	14.10	P.KIRKPATRICK	X	
			95652	SMF	040052684262	02-06-97	02-10-97	10:19	2	1	IP	4.40	P.LARECKI	X	
			95652	SMF	040052684332	02-06-97	02-10-97	10:19	2	2	IP	17.80	P.LARECKI	X	
		SAN DIEGO	92127	MYF	040052606282	02-27-97	03-03-97	10:04	2	1	IP	6.60	D.RUSSO	X	
	FL	JACKSONVILLE	32229	NIP	040052684623	02-10-97	02-12-97	09:19	2	1	IP	1.10	R.SAIN	X	
		PANAMA CITY	32403	PFN	040052684682	02-11-97	02-13-97	10:28	2	1	IP	12.10	A.MCDONALD	X	
	GA	MACON	31098	MCN	040052606234	02-26-97	02-28-97	10:57	2	1	IP	4.40	L.WATSON	X	
			31098	MCN	040052606385	02-28-97	03-03-97	09:50	1	1	IP	45.10	L.WATSON	X	
			31098	MCN	040052606525	02-28-97	03-03-97	09:50	1	1	IP	52.90	L.WATSON	X	
			31098	MCN	040052685555	02-21-97	02-26-97	10:22	3	1	IP	14.50	J.COLAZZO	X	
			31098	MCN	040052685640	02-21-97	03-04-97	11:34	7	1	IP	33.00	C.HAN	X	
			31098	MCN	040052685824	02-25-97	02-27-97	10:16	2	1	IP	29.50	L.WATSON	X	
			31098	MCN	040052685010	02-17-97	02-19-97	10:01	2	2	IP	33.00	L.GOLDEN	X	

* HOLD FOR PICKUP PACKAGES, EXCEPTIONS TO NORMAL DELIVERY AND SHIPMENTS WITHOUT POD (PROOF OF DELIVERY) ARE NOT INCLUDED. SEE PARTS 3 THROUGH 5 FOR BREAKOUT.

RUN DATE: 04/03/97
RUN TIME: 02:38.35
SEQUENCE: COUNTRY/STATE/CITY/ZIP
SERVICE DAYS: 20
WGT: POUNDS

F E D E R A L E X P R E S S C O R P O R A T I O N
CUSTOMER TIME-IN-TRANSIT
ACCOUNT 2085 OFFSHORE/27
FEBRUARY

149321 PAGE : 3
11517 REPORT : FEQZ206-R01
DEPT-LOC : 249-010

CUSTOMER NUMBER 1672-4130-1

DESTINATION BREAKOUT OF INTERNATIONAL SHIPMENTS WITH POD (PART 2)*

#---------- DESTINATION ----------# CO ST CITY	ZIP	STA	TRACKING NUMBER	DATE SHIPPED	DELIVERY DATE	DEL TIME	# DEL DAYS	# OF PKGS	TYP SVC	SHIPMENT WEIGHT	POD RECIPIENT NAME	DOC TYPE	REFERENCE NOTES
US GA MACON	31098	MCN	040052685021	02-17-97	02-19-97	10:01	2	2	IP	33.00	L.GOLDEN	X	
	31098	MCN	040052685043	02-17-97	02-19-97	10:01	2	2	IP	17.60	L.GOLDEN	X	
	31098	MCN	040052685124	02-18-97	02-24-97	11:45	4	2	IP	72.70	. P SMART	X	
	31098	MCN	040052685194	02-19-97	02-22-97	11:09	3	1	IP	14.10	E.MAYNARD SR	X	
	31098	MCN	040052685205	02-19-97	02-22-97	11:30	3	1	IP	23.10	J.FOSTER	X	
	31098	MCN	040052685220	02-19-97	02-22-97	11:45	3	1	IP	13.20	R.GOLDEN	X	
	31098	MCN	040052685312	02-19-97	02-22-97	11:30	3	1	IP	44.00	J.FOSTER	X	
	31098	MCN	040052685426	02-21-97	02-24-97	10:27	1	1	IP	62.30	W.ATSON	X	
	31098	MCN	040052685636	02-21-97	02-24-97	14:45	1	1	IP	33.00	P.BARFIELD	X	
	31098	MCN	040052685710	02-21-97	02-24-97	10:27	1	1	IP	37.40	W.ATSON	X	
	31098	MCN	040052685732	02-21-97	02-24-97	10:27	1	1	IP	11.00	W.ATSON	X	
	31098	MCN	040052685743	02-21-97	02-25-97	10:28	2	1	IP	13.20	L.WATSON	X	
	31098	MCN	040052684601	02-10-97	02-12-97	10:29	2	2	IP	2.20	D.ASHLEY	X	
	31098	MCN	040052684715	02-12-97	02-14-97	10:27	2	3	IP	33.00	R.GOLDEN	X	
	31098	MCN	040052684726	02-12-97	02-14-97	10:25	2	3	IP	33.00	G.MCDONALD	X	
	31098	MCN	040052684811	02-13-97	02-17-97	09:20	2	1	IP	18.90	R.GOLDEN	X	
	31098	MCN	040052684951	02-15-97	02-17-97	10:15	1	1	IP	34.10	P.BARFIELD	X	
	31098	MCN	040010263805	01-30-97	02-03-97	09:23	2	3	IP	4.40	P.BARFIELD	X	
	31098	MCN	040052684052	02-04-97	02-06-97	10:23	2	1	IP	18.30	R.GOLDEN	X	
	31098	MCN	040052684240	02-06-97	02-10-97	10:21	2	1	IP	2.20	R.WEST	X	
	31098	MCN	040052684494	02-07-97	02-10-97	10:21	1	2	IP	33.00	R.WEST	X	
	31098	MCN	040052685172	02-19-97	02-22-97	11:09	3	1	IP	24.00	E.MAYNARD SR	X	
	31098	MCN	040052685231	02-19-97	02-21-97	09:08	2	1	IP	49.60	J.DAVILA	X	
	84056	MCN	040052606083	02-25-97	02-28-97	10:57	3	1	IP	90.30	L.WATSON	X	
ID MOUNTAIN HOME	83648	BOI	040052684671	02-10-97	02-12-97	10:56	2	1	IP	1.10	J.BOWYER	X	
LA NEW ORLEANS	70143	MSY	040052684645	02-10-97	02-12-97	10:39	2	1	IP	17.80	D.LACOSTE	X	
	70143	MSY	040052684096	02-04-97	02-06-97	10:15	2	1	IP	53.10	L.COUSINS	X	
MO BRIDGETON	63044	ALN	040052684660	02-10-97	02-12-97	08:23	2	1	IP	17.20	L.JONES	X	
NC FAYETTEVILLE	28308	FAY	040052684995	02-17-97	02-19-97	11:55	2	1	IP	1.10	C.HILL	X	
GOLDSBORO	27531	RWI	040052684166	02-05-97	02-07-97	10:29	2	1	IP	1.10	R.FRENTES	X	
	27531	RWI	040052684085	02-04-97	02-06-97	17:06	2	1	IP	1.10	R.JOHNSON	X	
NE OFFUTT	68113	OMA	040052684763	02-12-97	02-14-97	08:55	2	1	IP	4.40	J.DINSMORE	X	
NJ VINELAND	08360	MIV	040052684575	02-07-97	02-11-97	09:27	2	1	IP	8.80	F.LUND	X	
NM CLOVIS	88101	CVN	040052606562	02-28-97	03-03-97	09:18	1	1	IP	20.20	M.LEWIS	X	
	88101	CVN	040052606573	02-28-97	03-03-97	09:18	1	1	IP	21.60	M.LEWIS	X	
	88101	CVN	040052606455	02-28-97	03-03-97	09:18	1	1	IP	21.60	M.LEWIS	X	
NV LAS VEGAS	89191	VGT	040052606396	02-28-97	03-03-97	10:25	1	1	IP	41.80	O.BEZEK	X	
OH COLUMBUS	43216	GQQ	040052684472	02-07-97	02-11-97	10:29	2	1	IP	3.30	G.CURTZ	X	
HEATH	43056	MNN	040052684446	02-07-97	02-10-97	09:52	1	1	IP	94.80	J.FLATT	X	

* HOLD FOR PICKUP PACKAGES, EXCEPTIONS TO NORMAL DELIVERY AND SHIPMENTS WITHOUT POD (PROOF OF DELIVERY) ARE NOT INCLUDED. SEE PARTS 3 THROUGH 5 FOR BREAKOUT.

RUN DATE: 04/03/97
RUN TIME: 02:38.35
SEQUENCE: COUNTRY/STATE/CITY/ZIP
SERVICE DAYS: 20
WGT: POUNDS

F E D E R A L E X P R E S S C O R P O R A T I O N
CUSTOMER TIME-IN-TRANSIT
ACCOUNT 2085 OFFSHORE/27
FEBRUARY

149321 PAGE : 4
11518 REPORT : FEQZ206-R01
DEPT-LOC : 249-010

CUSTOMER NUMBER 1672-4130-1

DESTINATION BREAKOUT OF INTERNATIONAL SHIPMENTS WITH POD (PART 2)*

#---------- DESTINATION ----------* CO ST CITY	ZIP	STA	TRACKING NUMBER	DATE SHIPPED	DELIVERY DATE	DEL TIME	# DEL DAYS	# OF PKGS	TYP SVC	SHIPMENT WEIGHT	POD RECIPIENT NAME	DOC REFERENCE TYPE	NOTES
US OH HEATH	43056	MNN	040052685146	02-18-97	02-20-97	09:11	2	1	IP	21.60	D.HANBY	X	
	43056	MNN	040052685345	02-20-97	02-24-97	07:59	2	1	IP	21.60	D.HANBY	X	
	43056	MNN	040052684962	02-15-97	02-17-97	07:28	1	1	IP	19.80	D.HANBY	X	
OK OKLAHOMA CITY	73145	OKC	040052684111	02-05-97	02-07-97	10:55	2	3	IP	46.30	L.SWANSON	X	
	73145	OKC	040052606466	02-28-97	03-03-97	11:41	1	1	IP	88.10	J.WARNICK	X	
	73145	OKC	040052606503	02-28-97	03-03-97	11:41	1	1	IP	9.90	J.WARNICK	X	
	73145	OKC	040052685463	02-21-97	02-24-97	11:00	1	1	IP	30.80	L.SWANSON	X	
	73145	OKC	040052685522	02-21-97	02-24-97	11:00	1	1	IP	13.20	L.SWANSON	X	
PA PHILADELPHIA	19111	NXX	040052606186	02-26-97	02-28-97	13:55	2	1	IP	6.60	W.RAPP	X	
	19111	NXX	040052606481	02-28-97	03-03-97	10:01	1	1	IP	1.10	N.RAPP	X	
TOBYHANNA	18466	AVP	040052606374	02-27-97	03-01-97	10:18	2	1	IP	28.60	R.ONDRAKO	X	
SC SUMTER	29152	SUM	040052606271	02-27-97	03-03-97	08:56	2	1	IP	17.60	T.FOURSEE	X	
TX FORT WORTH	76108	FTW	040052685931	02-25-97	02-27-97	09:35	2	1	IP	79.30	G.CURRY	X	
	76108	FTW	040052685323	02-20-97	02-24-97	09:25	2	1	IP	79.30	D.DANIEL	X	
KELLY AFB	78243	SVZ	040052684133	02-05-97	02-07-97	09:57	2	1	IP	11.00	D.HAVERTY	X	
SAN ANTONIO	78241	SVZ	040052606046	02-25-97	02-28-97	09:57	3	1	IP	45.80	M.LOPEZ	X	
	78241	SVZ	040052685964	02-25-97	02-28-97	09:57	3	1	IP	67.60	M.LOPEZ	X	
	78241	SVZ	040052685986	02-25-97	02-27-97	09:39	2	1	IP	27.50	J.RUBIO	X	
	78241	SVZ	040052685990	02-25-97	02-27-97	09:39	2	1	IP	26.40	J.RUBIO	X	
	78241	SVZ	040052684752	02-12-97	02-14-97	09:19	2	1	IP	123.40	M.LOPEZ	X	
	78241	SVZ	040052684376	02-07-97	02-10-97	09:30	1	2	IP	28.60	J.RUBIO	X	
	78241	SVZ	040052684564	02-07-97	02-10-97	09:30	1	1	IP	8.80	J.RUBIO	X	
	78241	SVZ	040052684612	02-10-97	02-12-97	09:38	2	2	IP	72.70	J.RUBIO	X	
	78241	SVZ	040052606120	02-25-97	02-28-97	09:57	3	1	IP	50.70	M.LOPEZ	X	
	78241	SVZ	040052606131	02-25-97	02-28-97	09:57	3	1	IP	79.30	M.LOPEZ	X	
	78241	SVZ	040052606201	02-26-97	02-28-97	09:57	2	1	IP	69.40	M.LOPEZ	X	
	78241	SVZ	040052606256	02-26-97	02-28-97	09:00	2	1	IP	63.90	B.LATHAM	X	
	78241	SVZ	040052606304	02-27-97	03-03-97	09:38	2	1	IP	108.20	J.RUBIO	X	
	78241	SVZ	040052606411	02-28-97	03-03-97	09:43	1	1	IP	66.10	J.RODRIQUEZ	X	
	78241	SVZ	040052606444	02-28-97	03-03-97	09:38	1	1	IP	6.60	J.RUBIO	X	
	78241	SVZ	040052685835	02-25-97	02-27-97	09:39	2	1	IP	2.20	J.RUBIO	X	
	78241	SVZ	040052686001	02-25-97	02-27-97	09:39	2	1	IP	18.90	J.RUBIO	X	
	78241	SVZ	040052685150	02-18-97	02-21-97	09:27	3	1	IP	6.60	J.RUBIO	X	
	78241	SVZ	040052685474	02-21-97	02-24-97	13:20	1	1	IP	1.10	.SUDOH	X	
	78241	SVZ	040052684730	02-12-97	02-14-97	09:56	2	3	IP	15.40	F.BELTRAN	X	
	78241	SVZ	040052684914	02-14-97	02-17-97	10:19	1	1	IP	2.20	J.RODRIQUEZ	X	
	78241	SVZ	040052684925	02-14-97	02-17-97	10:19	1	1	IP	13.20	J.RODRIQUEZ	X	
	78241	SVZ	040052684026	02-04-97	02-06-97	10:12	2	3	IP	2.20	B.SANCHEZ	X	
	78241	SVZ	040052684144	02-05-97	02-07-97	09:42	2	1	IP	4.40	J.RUBIO	X	

* HOLD FOR PICKUP PACKAGES, EXCEPTIONS TO NORMAL DELIVERY AND SHIPMENTS WITHOUT POD (PROOF OF DELIVERY) ARE NOT INCLUDED. SEE PARTS 3 THROUGH 5 FOR BREAKOUT.

RUN DATE: 04/03/97
RUN TIME: 02:38.35
SEQUENCE: COUNTRY/STATE/CITY/ZIP
SERVICE DAYS: 20
WGT: POUNDS

F E D E R A L E X P R E S S C O R P O R A T I O N
CUSTOMER TIME-IN-TRANSIT
ACCOUNT 2085 OFFSHORE/27
FEBRUARY

149321 PAGE : 5
11519 REPORT : FEQZ206-R01
DEPT-LOC : 249-010

CUSTOMER NUMBER 1672-4130-1

DESTINATION BREAKOUT OF INTERNATIONAL SHIPMENTS WITH POD (PART 2)*

DESTINATION CO	ST	CITY	ZIP	STA	TRACKING NUMBER	DATE SHIPPED	DELIVERY DATE	DEL TIME	# DEL DAYS	# OF PKGS	TYP SVC	SHIPMENT WEIGHT	POD RECIPIENT NAME	DOC TYPE	REFERENCE NOTES
US	TX	SAN ANTONIO	78241	SVZ	040052684553	02-07-97	02-10-97	10:02	1	1	IP	8.80	J.RUBIO	X	
		SHEPPARD AFB	76311	SPS	040052685813	02-24-97	02-26-97	09:57	2	1	IP	13.20	T.WESTON	X	
			76311	SPS	040052684656	02-10-97	02-12-97	10:35	2	1	IP	6.60	T.WESTON	X	
	UT	HILL AFB	84056	OGD	040052684483	02-07-97	02-10-97	10:20	1	1	IP	6.60	G.STEADMAN	1	
		OGDEN	84056	OGD	040052685916	02-25-97	02-27-97	10:28	2	1	IP	12.10	T.WARD	X	
			84056	OGD	040052685920	02-25-97	02-28-97	10:25	3	1	IP	79.30	T.WARD	X	
			84056	OGD	040052685953	02-25-97	02-27-97	10:28	2	1	IP	16.00	T.WARD	X	
			84056	OGD	040052685183	02-19-97	02-21-97	10:27	2	1	IP	4.40	T.WARD	X	
			84056	OGD	040052685356	02-20-97	02-24-97	09:41	2	1	IP	8.80	T.WARD	X	
			84056	OGD	040052685570	02-21-97	02-25-97	10:05	2	1	IP	2.20	T.WARD	X	
			84056	OGD	040052685721	02-21-97	02-24-97	09:41	1	1	IP	6.60	T.WARD	X	
			84056	OGD	040052685780	02-24-97	02-26-97	10:21	2	1	IP	57.30	T.WARD	X	
			84056	OGD	040052684741	02-12-97	02-14-97	10:29	2	1	IP	136.60	T.WARD	X	
			84056	OGD	040052684892	02-14-97	02-17-97	10:01	1	1	IP	13.20	G.STEADMAN	X	
			84056	OGD	040052684984	02-15-97	02-17-97	10:01	1	1	IP	110.20	G.STEADMAN	X	
			84056	OGD	040052685006	02-17-97	02-19-97	10:17	2	1	IP	4.40	T.WARD	X	
			84056	OGD	040052685032	02-17-97	02-19-97	10:17	2	2	IP	209.40	T.WARD	X	
			84056	OGD	040010263993	02-03-97	02-06-97	10:10	3	1	IP	33.00	T.WARD	X	
			84056	OGD	040052684074	02-04-97	02-06-97	10:10	2	1	IP	19.10	T.WARD	X	
			84056	OGD	040052684505	02-07-97	02-10-97	10:20	1	1	IP	81.50	G.STEADMAN	X	
			84056	OGD	040052685791	02-24-97	02-26-97	10:21	2	1	IP	2.20	T.WARD	X	
	VA	LANGLEY AFB	23665	PHF	040052685776	02-24-97	02-26-97	09:27	2	1	IP	4.40	C.FRAZE	X	
			23665	PHF	040052684634	02-10-97	02-12-97	09:18	2	1	IP	1.10	C.FRASE	X	
			23665	PHF	040052684100	02-05-97	02-07-97	09:37	2	2	IP	4.40	J.LEHMAN	X	
			23665	PHF	040052684284	02-06-97	02-10-97	09:10	2	1	IP	2.20	J.LEHMAN	X	
			23665	PHF	040052684030	02-04-97	02-06-97	09:36	2	1	IP	1.10	P.SUNDAY	X	
		RICHMOND	23297	RIC	040052684435	02-07-97	02-11-97	11:01	2	1	IP	2.20	N.TRAMMULL	X	

TOTAL INTERNATIONAL PACKAGES WITH POD = 168

* HOLD FOR PICKUP PACKAGES, EXCEPTIONS TO NORMAL DELIVERY AND SHIPMENTS WITHOUT POD (PROOF OF DELIVERY) ARE NOT INCLUDED. SEE PARTS 3 THROUGH 5 FOR BREAKOUT.

Appendix C. March 1997 Federal Express Flight Schedule

MEMPHIS, TN to Frankfurt Germany

FLIGHT OR ACTIVIT	ORIGIN LOCAL	DEST LOCAL	DISTANCE	LOCAL DEPT.	LOCAL ARR.	GMT(Z) DEPT.	GMT(Z) ARR.	ELAPSE TIME	ELAPSE TIME
Depart Memphis Hub				Tue 3:24		Tue 9:24			
Flight #0004 (MD11)	MEM	CDG		Tue 3:24	Tue 18:46	Tue 9:24	Tue 17:46	8:22	8:37
Transload @ CDG Hub	CDG	CDG	0	Tue 18:46	Tue 20:40	Tue 17:46	Tue 19:40	1:54	1:90
Flight #006F (B727-200)	CDG	FRA		Tue 20:40	Tue 21:53	Tue 19:40	Tue 20:53	1:13	1:22
Arrive Frankfurt			0		Tue 21:53		Tue 20:53	11:29	11:48
Depart Memphis Hub				Tue 3:24		Tue 9:24			
Flight #0004 (MD11)	MEM	CDG		Tue 3:24	Tue 18:46	Tue 9:24	Tue 17:46	8:22	8:37
Transload @ CDG Hub	CDG	CDG	0	Tue 18:46	Tue 21:15	Tue 17:46	Tue 20:15	2:29	2:48
Flight #004A (B727-200)	CDG	FRA		Tue 21:15	Tue 22:28	Tue 20:15	Tue 21:28	1:13	1:22
Arrive Frankfurt			0		Tue 22:28		Tue 21:28	12:04	12:07

Newark, NJ to Frankfurt Germany

FLIGHT OR ACTIVIT	ORIGIN LOCAL	DEST LOCAL	DISTANCE	LOCAL DEPT.	LOCAL ARR.	GMT(Z) DEPT.	GMT(Z) ARR.	ELAPSE TIME	ELAPSE TIME
Depart Newark Hub				Tue 3:30		Tue 8:30			
Flight #0006 (MD11)	EWR	PIK		Tue 3:30	Tue 14:28	Tue 8:30	Tue 14:28	5:58	5:97
Ground time @ PIK	PIK	PIK	0	Tue 14:28	Tue 16:40	Tue 14:28	Tue 15:40	1:12	1:20
Flight #0006 (MD11)	PIK	CDG		Tue 16:40	Tue 18:13	Tue 15:40	Tue 17:13	1:33	1:55
Transload @ CDG Hub	CDG	CDG	0	Tue 18:13	Tue 20:40	Tue 17:13	Tue 19:40	2:27	2:45
Flight #006F (B727-200)	CDG	FRA		Tue 20:40	Tue 21:53	Tue 19:40	Tue 20:53	1:13	1:22
Arrive Frankfurt			0		Tue 21:53		Tue 20:53	12:23	12:38
Depart Memphis Hub				Tue 3:30		Tue 8:30			
Flight #0006 (MD11)	EWR	PIK		Tue 3:30	Tue 14:28	Tue 8:30	Tue 14:28	5:58	5:97
Ground time @ PIK	PIK	PIK	0	Tue 14:28	Tue 16:40	Tue 14:28	Tue 15:40	1:12	1:20
Flight #0006 (MD11)	PIK	CDG		Tue 16:40	Tue 18:13	Tue 15:40	Tue 17:13	1:33	1:55
Transload @ CDG Hub	CDG	CDG	0	Tue 18:13	Tue 21:15	Tue 17:13	Tue 20:15	3:02	3:03
Flight #006F (B727-200)	CDG	FRA		Tue 21:15	Tue 22:28	Tue 20:15	Tue 21:28	1:13	1:22
Arrive Frankfurt			0		Tue 21:53		Tue 20:53	12:58	12:97

Appendix D, Document Identifier Code Explanations

1. Document Identifier Code:

"The document identifier code is used on all Military Standard Transportation and Movement Procedures (MILSTAMP) data records. It is a means of identifying the functional area system (transportation, supply, etc.), to which the document relates and the intended purpose of the document (TCMD, manifest, tracer, etc.)" (DoD 4500.32-R, 1987:F8-1).

a. AS1:

"To notify the requisitioners about the estimated shipping date (ESD) or the actual shipping date of their requisitioned items. The ESD indicates that the items are waiting to be released for shipment; the actual shipping data indicates the day the items will be released to a carrier. Shipment status also provides data for interface with Transportation and for shipment tracing by consignee, as provided in Military Standard Transportation and Movement Procedures (MILSTAMP)" (67-1, 1989:9-155).

b. TX1: "Shipments not otherwise covered—Prime document for LRU (define) shipment (including empty SEAVAN, CONEX, etc.) not in a consolidation container" (DoD 4500.32-R, 1987:F8-2). This is the date the customer inputs into the system or the Headquarters Air Force Material Command Air Clearance Authority Challenge Desk inputs into the system for requested shipment date to the APOE (Suther, 1997).

c. TXA: "Shipments not otherwise covered-- Prime document for LRU (define) shipment (including empty SEAVAN, CONEX, etc.) not in a consolidation container" (DoD 4500.32-R, 1987:F8-2). This DIC is the APOE receipt date for loose cargo (Moon, 1997).

d. TXD: "Shipments not otherwise covered—Prime document for shipment units consolidated in a container (CONEX, SEAVAN, MILVAN, 463L Pallet, RORO, or Unitized Pallet Load) (DoD 4500.32-R, 1987:F8-3). This DIC is the APOE receipt date for containerized cargo (Moon, 1997).

e. TK1: "Prepared by initial intratheater airlift terminal showing hour/day shipment unit is received and forwarded" (DoD 4500.32-R, 1987:F8-4). This DIC is primarily used for advanced notification of an impending shipment (Moon, 1997).

f. TK2: "Prepared by intermediate intratheater airlift terminal showing hour/day shipment unit is received and forwarded" (DoD 4500.32-R, 1987:F8-4). This DIC is primarily used for advanced notification of an impending shipment (Moon, 1997).

g. TK6: "Prepared by AMC APOD showing hour/day shipment unit is received at an APOD and forwarded to the ultimate consignee" (DoD 4500.32-R, 1987:F8-5).

h. TK7: "Prepared by HQ AMC/OCCA showing hour/day each export shipment unit is received/lifted from CONUS by AMC and MSC. The OCCA entries include the date of overseas vessel discharge" (DoD 4500.32-R, 1987:F8-5). The primary purpose of this DIC is to provide trailer data—Additional handling instructions or specific cargo profile (e.g. explosives, proper shipping name, outsize cargo) (Moon, 1997).

i. D6S Receipt Date: "To receive materiel. These transactions are submitted for report codes 6 or 7 to record gains to the Air Force inventory and maintain in-transit control" (67-1, 1989:10-43).

2. Document Number: "Most of the transactions processed with Base Supply are assigned an organizational document number made up of 14 alpha and numeric characters. It is a control or reference number used to identify a specific transaction" (AFM 67-23, 1991:16).
3. Consignor DoDAAC: Department of Defense Activity Address Code of Shipper
4. Consignee DoDAAC: Department of Defense Activity Address Code of Receiver
5. APOE: Aerial Port of Embarkation
6. APOD: Aerial Port of Debarkation

Bibliography

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Condon Vita

Captain Travis Condon was born on 8 October 1966 in Long Beach, California. He graduated from Bret Harte High School in 1984. On 27 March 1985, he enlisted in the United States Air Force and embarked on a series of assignments while working towards his degree. In September 1990 he received a Bachelor of Science degree in Management from Golden Gate University and subsequently entered Officer Training School in August 1991.

Upon graduation from OTS in November 1991, he was assigned to Griffiss AFB, NY as Chief, Combat Readiness and Resources and graduated from Transportation Officer School at Sheppard AFB, Texas in March 1992. In June 1993, he was reassigned to Falcon AFB, CO as Chief of Transportation and while assigned to this location he completed his Master of Science degree in Business Management at the State University of New York Institute of Technology at Utica/Rome, New York. Following this short assignment, he cross-trained into Logistics Plans and was reassigned to Sembach AFB, GE as Chief, Logistics Plans in June 1994.

It was from this location that he entered the prestigious Air Force Institute of Technology Graduate School of Logistics and Acquisition Management in May 1996 and graduated with a Master of Science degree in Transportation Management and Supply Management in September 1997. He was subsequently assigned to Headquarters Air Mobility Command as a Transportation Plans Staff Officer.

Permanent address: P.O. Box 472
Arnold, CA 95223

Patterson Vita

Captain Kirk A. Patterson was born on 11 September 1962 in Dothan, Alabama. He graduated from Northview High School in 1981 and attended Georgia Institute of Technology in Atlanta, Georgia. He later transferred to Auburn University in Auburn, Alabama where he graduated in December 1985 with a Bachelor of Science degree in Biology. He continued his education at Auburn University, earning a Master of Science degree in Interdepartmental Physiology in June 1988. He received his commission from Officer Training School on 31 July 1991 and graduated from Transportation Officer School at Sheppard Air Force Base, Texas in November 1991.

His first tour of duty was with the 6th Aerial Port Squadron at Howard AFB, Panama. In September 1993, he was assigned to the 8th Transportation Squadron, Kunsan AB, Republic of Korea. One year later he was assigned to the 432nd Transportation Squadron, Misawa ABS, Japan.

Captain Patterson entered the Graduate School of Logistics and Acquisition Management, Air Force Institute of Technology, in May 1996 and graduated with a Master of Science degree in both Transportation Management and Supply Management in September 1997. He was subsequently assigned to Headquarters Air Force Materiel Command as a Transportation representative on the Inspector General team.

Permanent address: 1263 Westgate Pkwy.
Dothan, Alabama 36303

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13. ABSTRACT (*Maximum 200 Words*)

The DoD has begun outsourcing airlift in order to expedite high priority cargo movement. However, are commercial express carriers more expedient in the cargo delivery than the Air Force organic transportation system? Although anecdotal evidence suggests commercial carriers are faster, little empirical research has been conducted on this subject.

This study compares the military's organic transportation system with Federal Express in the delivery of high priority cargo to Spangdahlem Air Base, Germany. The Large Sample Test of Hypothesis was used to determine if there was a significant difference between the cargo transit times of the two.

The mean delivery time for the military's organic transportation system from CONUS to Spangdahlem was 6.24 days, while Federal Express' mean delivery time was 2.71 days.

The primary conclusion drawn from this research is that Federal Express is indeed able to transport small items (weighing less than 150 pounds) to Spangdahlem AB, Germany faster than the military's traditional organic transportation system. A secondary conclusion taken from this research is that every segment of the pipeline except the actual flight time between CONUS and Europe all take significantly longer for the military system than for the commercial system.

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